

# ANNUAL REPORT 2020-21

INDIAN INSTITUTE OF TECHNOLOGY MADRAS  
CHENNAI - 600 036



# 2020-2021 Annual Report



Indian Institute of Technology Madras  
Chennai – 600 036





# The Visitor

Mr. Ram Nath Kovind  
President of India

## Members of Board of Governors

Dr. Pawan Goenka - Chairman  
Managing Director & CEO  
Mahindra & Mahindra  
Mahindra Towers, Mumbai

Prof. Bhaskar Ramamurthi  
Director  
Indian Institute of Technology Madras  
Chennai - 600 036

## Council Nominees

Dr. B Mahadevan  
Professor of Operations Management  
Indian Institute of Management Bangalore  
Bannerghatta Road, Bangalore 560 076

Prof. Shireesh B Kedare,  
Department of Energy Science and Engineering,  
Indian Institute of Technology Bombay,  
Mumbai - 400 076

Shri. Rakesh Ranjan  
Additional Secretary (TE) Ministry of Education,  
Shastri Bhawan New Delhi

Dr. S Kishore Kumar  
DRDO Fellow  
Gas Turbine Research Establishment  
CV Raman Nagar, Bangalore – 560 093

## Senate Nominees

Prof. K. Rajagopal  
Department of Civil Engineering.  
Indian Institute of Technology Madras  
Chennai – 600 036

Prof. N. Ramesh Babu  
Department of Mechanical Engineering  
Indian Institute of Technology Madras  
Chennai – 600 036

## State Government Nominees

Shri K. Vivekanandan, I.A.S.  
Director  
Directorate of Technical Education  
Government of Tamil Nadu  
Chennai – 600 025

Thiru. A. Anbarasu, I.A.S.  
Development Commissioner-cum-Secretary to Govt.  
(Education)  
Chief Secretariat  
Puducherry – 605 001 (till 18.02.2021)

Thiru. Ashok Kumar, I.A.S.  
Secretary to Govt. (Education)  
Chief Secretariat  
Puducherry – 605 001  
Email: secytran.pon@nic.in  
Ph: 0413 – 2334484 / 2233306 (w.e.f 19.02.2021)

## Secretary

Dr Utpal Sharma  
Principal (BRAIT)-cum-Special Secretary (IT)  
Dr.B.R. Ambedkar Institute Technology Campus  
Pahargaon, Port Blair -744 104

Dr. Jane Prasad, IP & TAFS  
Registrar  
Indian Institute of Technology Madras  
Chennai – 600 036

## Invitee

Prof. Koshy Varghese  
Dean (Administration)  
IIT Madras, Chennai – 600 036



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# Director's Report

Presented on the 58th Convocation of IIT Madras, held on 20th November 2021

**C**hief Guest, Ms P. V. Sindhu; Chairman, Board of Governors, IIT Madras, Dr Pawan Goenka; Members of the Board of Governors; Members of the Senate; Graduands; Distinguished Invitees; Colleagues and Students

The 58th convocation of IIT Madras is indeed very special. It is not because we are celebrating a jubilee year, nor is it because we are awarding the 60,000th degree, though we are getting close! It is because the students, faculty and staff of the institute have weathered the pandemic so far without giving a quarter, ensuring that everyone eligible to graduate does so, and every new student admitted is able to get started on one's academics even if it is online. We pause to remember the few, but precious, colleagues we lost to the pandemic despite heroic efforts to save them and salute their commitment to the institute and their profession. We also applaud the efforts of frontline staff in the institute who have turned up at their posts throughout the pandemic despite grave risk and uncertainty.

We are having our Convocation virtually for the second consecutive year, though we sincerely hope this will be the last time we have to do this. I know graduands had been hoping to come here in person for this grand event not only to meet their friends and teachers and bid them good-bye, but also to meet our young, charismatic Chief Guest and get enthused by her passion for her sport. We are all familiar with Ms Sindhu's magical abilities to convert adversity to opportunity, and I am sure she will make this virtual convocation as well a memorable experience for each of us. To our graduands, prize winners and their families spread out across the country and the world, hearty congratulations on your achievements. You can take quiet satisfaction in a job

well done under very trying circumstances.

IIT Madras, has yet again clinched the #1 position among Engineering Institutes in the NIRF ranking, a position that it has assiduously held since the inception of NIRF in 2016. We have also retained the #1 position for the third year in a row for overall performance among all universities in India. We have been placed in the second position among Research Universities in India, a new category that has been introduced this year in the NIRF ranking. IIT Madras was judged as The Most Innovative Institute of the Year 2020 for its disruptive innovations by the Confederation of Indian Industry (CII). Thanks to the incessant hard work of our students, faculty and staff, we are setting higher standards with each passing year and ensuring we hold onto our pre-eminent position.

IIT Madras was designated as an Institute of Eminence in early 2020. We are using the special grant that comes with it primarily to give a sharp impetus to our research activities. Through an internal competitive process, we have identified for support nearly 70 research initiatives grouped under 21 clusters: AI and Data Sciences; Advanced Materials; Autonomous Systems; Big Networks; Advanced Chemistry; Circular Economy; Complex Systems; Earth Sciences; Energy, Propulsion, and Renewables; Humanities and Business; Advanced Manufacturing; Mathematics and Cybersecurity; Medical Technology; Medicine and Biology; Microscopy, Microelectronics and Integrated Circuits; Ocean Technology; Physics; Quantum Science and Technology; Safety Science and Systems, and Sensing and Vision. More than half the faculty of the institute cutting across various disciplines are involved in these initiatives, each of which identifies one or more challenges being

currently addressed globally and includes collaborating partners from the best institutions worldwide. We are also using the funds to improve our infrastructure and bring it on par with the best institutes in the world. Our Strategic Plan 2021-2027 is ready and will guide us in furthering our vision towards establishing ourselves as a world-class engineering institution for research, teaching and innovation.

At this Convocation, 1,962 graduands will receive their degrees: 399 B.Tech (of whom 24 with Honours), 379 Dual Degree B.Tech and M.Tech, 366 M.Tech, 139 M.Sc, 44 M.A, 42 Executive MBA, 61 MBA of whom one is jointly with the University of Passau in Germany, 148 M.S., 311 Ph.D. and 72 Web-enabled M.Tech (including the first batch of 23 students in Information Security and 28 students in Automotive Technology) for executives. The above Ph.D. numbers also include six joint degrees with universities in Australia - one each with Curtin, Deakin and Swinburne Universities and three with University of Technology.

### 1. Degree programmes

We have since March 2020 continued all our classes online. While this is not a satisfactory situation, we have at least been able to ensure that the students continue to progress in their respective degree programmes on schedule. Research scholars are back on campus for the most part so that they can pursue their laboratory work. The Masters' students admitted in 2020 are now on campus on a voluntary basis to get some valuable hands-on experience before they graduate next summer. We propose to bring back undergraduate students batch by batch in the New Year, and hope that the improving pandemic situation permits us to do so without hindrance.

During the last academic year, we launched two more Inter-disciplinary dual-degree upgrade programmes in the areas of Complex System and Dynamics, and Cyber Physical Systems for our undergraduate students, taking the total number of such programmes offered at IIT Madras to 10. Web-based M.Tech programmes in Micro-Electronics and Industrial Artificial Intelligence for industry professionals have also been introduced, taking the total number of such programmes also to 10. The country's first online UG degree in Programming and Data Science at IIT Madras that was launched last year with multiple exit options at the foundational, diploma and degree levels, has been receiving tremendous response. This path-breaking programme provides high-quality education with very good employment prospects to all aspirants who can fulfill our rigorous curricular requirements. The number of students pursuing the programme has exceeded the number of on-campus students in the first year itself!

To reach out to people at large as well as the global

research community, IIT Madras has launched several webinar series in the period under review. SIDDHI was launched to commemorate the 150th birth anniversary of Mahatma Gandhi, where ongoing work that impinges on Swaraj as propagated by Gandhiji - self-reliance, self-sufficiency, self-governance and the equitable and inclusive development of all sections of India - are presented. IRIS (IIT Madras Research Initiative Spotlight) is yet another webinar series launched to showcase the research initiatives being pursued in emerging areas of global interest as outlined earlier. Both these series have received wide attention and served to connect our institute to a wide cross-section of people across the world.

### 2. Research and distinctions secured by our faculty members and students

Despite the lockdowns and the consequent disruptions, our research scholars have soldiered on, ably supervised by the faculty, to produce record research output of a consistent high quality. Our growth in this regard is attested to by several metrics based on bibliographic analyses, both in terms of citations and areas of research. The new multi-disciplinary research initiatives provide an incredible opportunity to our research scholars to work on cutting-edge problems being pursued globally. Since all these initiatives include strong collaborations with leading research groups across the world, our scholars will get many opportunities to interact with peers elsewhere and immerse themselves in these partner-groups to obtain a truly global perspective.

IIT Madras has earlier this year launched a bimonthly science and technology magazine, IIT Madras Shaastra, which aims to bring an Indian perspective to the global developments in science and technology as well as their impact on society. Three issues of the magazine have been released and received by the discerning reader with acclaim. This magazine fills a void in the country's popular science and technology information space.

Our faculty continued to earn accolades during the academic year gone by. Notable among the academic honours bestowed on our faculty members are the following: Prof. Graham Cooks, our Distinguished Professor, as INSA Foreign Fellow, Prof. M Kamaraj as INAE Fellow, Profs. Krishnan Balasubramanian and B. Rajakumar as NASI Fellows, while Drs Abhishek Sinha and Aravind Kumar Chandiran were awarded the INSA Medal for Young Scientists.

Among the honours bestowed by our institute, Prof. Sarit Kumar Das has been awarded the Institute's Lifetime Achievement Award (the Senior-Level R&D Award), while Profs. Asish Kumar Sen and Jitendra S. Sangwai have been awarded the Mid-Career R&D Award, and Drs Karthik Raman, Sumesh P Thampi and Basudev Roy have been awarded the Early Career R&D Award. Three of

our young faculty, Drs Uday Kiran Khankhoje, Sreeram Krishnamoorthy Kalpathy and Dawood Kothawala have won the Young Faculty Recognition Award of the Institute for the year 2021. Prof. G. Venkatrathnam has been awarded the Srimathi Marti Annapurna Gurunath Award for Excellence in Teaching.

We have been able to continue to recruit high-quality faculty despite the disruptions in travel and re-location caused by the pandemic. This year, we have appointed 38 promising young faculty members, of whom 17, including four women, have already joined the institute.

The institute continues to attract substantial funding for its research and consultancy activities from the Ministries of the Government of India and industry. In 2020-21, the institute received sanction for 179 Ministry-sponsored projects for a total value of Rs. 359.25 crore, and 533 consultancy and industry-sponsored research projects amounting to Rs.230.09 crore. Despite the pandemic, we have maintained our growth momentum in attracting funding for research from both government and industry. The growth in the latter is particularly encouraging and heart-warming, as IIT Madras is widely perceived to be the leader in research collaboration with industry.

We filed for 195 patents during the year of which 68 are international filings and were granted 124 Indian and five international patents. Our faculty has undertaken nearly 50 projects in various research areas under the Corporate Social Responsibility (CSR) activities at a total value of Rs. 31.57 crore.

### 3. Research Park and our deep-tech startup incubation system

IITM Incubation Cell (IITMIC) and its sector-specific incubators for Medical Technology, Biosciences, Cyber Physical Systems and Rural Technologies continue to incubate around 40 companies annually, with a cumulative portfolio of 240 start-ups. Founded by IITM faculty, staff, students and alumni and external entrepreneurs, the companies span the breadth of deep-tech areas in globally critical domains, including manufacturing, robotics, data sciences, IoT, e-mobility, energy, water, healthcare, biotech and agri-tech. Of these, 25% companies have raised investments from angel investors/VCs; several companies started a few years ago have received Series A funding and are now attracting Series B/C funding at significant valuations. IITM-incubated companies are together valued at ₹11,400 crore, based on their last investment data. A total of 106 start-ups are in the market, having generated, despite the pandemic, revenue of ₹ 440 crore in FY20-21 and created more than 5,200 direct jobs. IITM start-ups have filed over 200 patents, and 10% of the start-ups are founded by women and

12% by IITM faculty. It is pertinent to note that all these are deep-technology start-ups that incorporate sophisticated engineering and high-end manufacturing in their products.

Over the years, IITMIC has created a thriving ecosystem consisting of feeder channels within IITM, a global mentor network comprising more than 100 alumni, industry, tech leaders, serial entrepreneurs and investors, partners among angel, VCs, industry CSR funds and banks, managers of central start-up schemes (for example, oil and gas), and agencies, along with a vast array of support services. All of this help us to support our start-ups, over a wider period, with a flexible or 'exit when you want' approach, steering them through the very challenging initial years where other sources of support or funders are more cautious to move into the slow-starting deep-tech space.

### 4. International collaborations

In view of the increasing international collaborations and student exchanges at IITM, a Deanship for Global Engagement was created in early 2020. IITM continued to expand its partnerships with several international universities and signed 22 MoUs and renewed 15 active ones that enable student exchanges and faculty collaborations, taking the total number of active MoUs to around 280. This year, a Joint Doctoral Program (JDPs) has been signed with University of Alberta, Canada taking the total number of JDPS to 19. Despite the pandemic, IIT Madras received 37 international students during the academic year and sent 56 of our own students to various universities abroad under the exchange programmes. A total of 54 scholars are enrolled in joint Ph.D. programmes with our partner universities.

As part of the new research initiatives, we are inviting many leading faculty experts who are collaborating with our faculty members to visit the institute for periods ranging from a month to a year or more. We propose to host these visitors from the next calendar year onwards. In many cases, senior graduate students or post-docs supervised by these visiting faculty will also accompany them. A significant number of our faculty members and research scholars are expected to spend similar periods at our partner universities as well. We expect these diverse partnerships to lead to cross-fertilisation of ideas and opening of new hitherto unexplored avenues for research.

The Global Research Internships in Engineering, Science, Humanities and Management, an initiative to attract international students from global universities for paid research internships of six to eight weeks, is now being offered completely online in view of the pandemic, and 13 interns have enrolled this year.

I would like to thank our partner universities for



continuing to collaborate even during these difficult times, thus, growing our relationships. These efforts will pay off handsomely once the pandemic is behind us.

## 5. Human resources

In the year under review, three staff have newly joined the institute, while nearly 50 of the existing staff have been promoted. To enable our staff equip themselves with necessary competencies, they have been provided opportunities to undergo various training programmes not only in their area of expertise, but also in ISO and official language. An online training programme on POSH (Prevention of Sexual Harassment at the Workplace) was also arranged to create awareness among faculty, staff and students.

## 6. Infrastructure development

The year 2020-21 was a good year for the infrastructure and renovation projects at IIT Madras, despite lockdowns and other disruptions.

Starting with the laying of the foundation stone for the Discovery Campus of our institute located at Thaiyur by the Hon'ble Prime Minister of India in February 2021, we have seen many new efforts either being launched or completed. The Discovery Campus is being developed to house large research centres of the institute with specialised facilities, such as the National Technology Centre for Ports, Waterways and Coasts, and the Centre for Propulsion Technology.

The Subramonian Shankar Block, a new G+3 building hosting the Computer Science Department, was inaugurated in September 2021, thanks to a generous donation from our alumnus Shri Subramonian Shankar. We also thank our distinguished alumnus Dr Krishna Chivukula for enabling the renovation of Cauvery hostel and alumnus V. Shankar for enabling the renovation of Godavari hostel. The old hostels are being upgraded with support from our alumni under the 'Keep it Flowing' programme.

The AMM Arunachalam Auditorium, in memory of our former Chairman, Board of Governors and supported by a generous grant from the Murugappa Group, was inaugurated in April 2021. The T T Jagannathan Auditorium honouring our distinguished alumnus and generous donor T T Jagannathan was inaugurated in August 2021.

We took advantage of the reduced traffic during the pandemic to integrate the In and Out Gates with state-of-the-art facilities such as a vehicle management system and automatic boom barriers. Likewise, the guest houses have been renovated while they were unoccupied.

The TERRACE@IITM, a 500-seater air-conditioned gathering space, has been created on the roof of the campus food courts. A similar space for student

activities has been created at the terrace of Dean (Students) Office. Revamping has been undertaken at the hallowed open-air theatre (OAT), as well as in the oldest academic buildings on campus, namely, MSB, ESB, HSB and BSB. Housing for new faculty members has also been renovated.

A new Mandakini hostel with G+9 floors capable of accommodating 1,225 students, an annexe of Electrical Science Block having G+6 floors, and an additional 64 quarters to accommodate married research scholars are some of the major projects very close to completion.

A women's hostel, a new academic complex, upgradation of water distribution system, upgradation of the Centre for Innovation (CFI) and staff housing are some projects that are under way.

The campus maintenance and engineering staff, as well as the security staff have worked heroically right through the lockdown to keep the campus humming without incident. We are indebted to them for their onerous efforts.

## 7. Student co-curricular and extra-curricular activities

Saarang 2021, the annual cultural festival of IIT Madras, was held successfully from 4-7 February 2021 in virtual mode and witnessed participation from more than 10,000 students from across the country and viewership by nearly 17,000. Saarang 2021 also saw the first edition of Saarang LitFest and Divyakalashakti.

Shaastra, the annual technical festival, was held in online mode from 25-28 February 2021. More than 20,000 participants witnessed the diverse set of workshops, hackathons, competitions and Spotlight lectures by global experts in science and engineering.

The CFI took up more than 50 multidisciplinary projects across several clubs, of which 13 were part of Student Innovation Program (SIP), a programme where students themselves come up with innovative solutions. Despite the pandemic, more than 300 students were actively involved this year.

The Entrepreneurship Cell and Nirmaan, the pre-incubation cell, have enabled students to benefit from exposure to entrepreneurship and explore converting their creative projects into start-ups.

## 8. Student welfare

Our Office of Hostel Management along with many volunteer faculty members serving in various capacities shoulder the arduous responsibility of taking care of our students in the hostels, in these troubled times. MiTr and Saathi, the two arms that have been taking care of the well-being of our students, conducted several online challenges and wellness marathon sessions to help students tide over their anxieties during this pandemic.

## 9. Placement

In 2020-21, the placement process went online. A total of 869 students including 142 with Pre-Placement Offers (PPO) got placed, of which nearly 40% were in core engineering and R&D companies; 21% in analytics, consulting and finance; and 28% in information technology. The placement season also saw about 38% increase in PPOs over last year; 105 companies were associated virtually for internships, resulting in 545 students getting internship offers through the Internship Cell.

## 10. Alumni matters

In 2021, we honoured Prof. Jayaraman Chandrasekhar, Prof. Ravi Subrahmanyam, Prof. B. S. Sathyaprakash, Dr. Ram Duvvuru Sriram, Dr. Shivkumar Kalyanaraman, Shri R. Madhavan, Dr. Suresh Kumar, Shri Yogesh Gupta, Shri Ajay Kaushal, Dr. Srinivasan "KG" Ganapathi and Shri Prasanna Ramaswamy, with the institute's Distinguished Alumnus Awards for their outstanding achievements in the areas of entrepreneurship, leadership and management, academia and research, and social and technological innovation.

The Institute Advisory Board has been constituted by our Board of Governors with eminent alumni, academicians and industry leaders as members to provide us with their wise counsel on new initiatives to accelerate our growth, for augmenting and managing our endowment, and for implementing best practices garnered from academic institutions worldwide.

In 2020-21, our Office of Alumni and Corporate Relations and the Office of Institutional Advancement raised Rs.101.49 crore. On behalf of the institute, I express our heartfelt gratitude to generous alumni the world over, large-hearted and socially conscious corporates and other well-wishers of the institution. Apart from the infrastructure projects mentioned earlier in the report supported by the alumni, the KK Balasubramanian, PC Varghese, VV Sastry, PS Rao, PK Aravindan and Nita and KG Ganapathi Chairs are some of

the Chairs that have been launched this year with alumni or well-wisher support. Donations have also helped to provide scholarships to students in need.

## 11. Acknowledgements

An endeavour on the scale of this institute and its entire gamut of activities takes place with the whole-hearted participation and support of all stakeholders - our faculty, students and staff; agencies and industries sponsoring R&D and consultancy projects; professionals from other organisations who assist us in various capacities; and our alumni and corporate donors with their generous support to our various activities. I would like to thank office-bearers such as Heads of Departments, Deans, Chairpersons, Wardens, Advisors, and Professors-in-charge of various cells and centres for the selfless work they put in to keep the institute ticking. The institute is grateful to the Ministry of Education, Government of India, for its continued and sustained encouragement and support. I also wish to thank the Government of Tamil Nadu for all the support it continues to extend in multiple ways.

I wish to thank Dr. Pawan Goenka, our Chairman, Board of Governors, and all Board members for their wise counsel, support and guidance, enabling us to scale new heights. I would like to express my heartfelt gratitude to our Chief Guest, Padma Bhushan awardee Ms P. V. Sindhu for gracing this Convocation. We are eager to listen to her message to the graduating class of 2021. A peer and role model to most of our graduands today, she has shown what can be achieved with grit, determination and talent. I am sure she has very valuable insights to share with our graduands.

Before I end, I would like to congratulate the prize winners once again and wish all our graduands happiness, professional success and fulfillment from a life of service to their profession, family and country. God bless you all.

*Jai Hind!*

## 2

## Administration

### 2.1. General

The Indian Institute of Technology Madras (IIT Madras) is an autonomous statutory organisation functioning within the Institutes of Technologies Act 1961, as amended by the Institute of Technology Amendment Act, 1963. The IITs are administrated centrally by the Councils of IITs, an apex body established by the Government of India (GoI) to coordinate the activities of these institutes. The Minister for Education, GoI is the Chairperson of the Council. Each IIT has a Board of Governors responsible for overall administration and control.

The Senate decides the academic policies of IIT Madras. It approves and controls the curricula,

courses, examinations and declaration of results. It appoints various committees to consider specific academic matters arising from time to time. The teaching, training and research activities of various departments at the institute are constantly under review to improve facilities and standards. The Director of the institute is the Chairman of the Senate. The members of the Senate are listed in Appendix 1. The Finance Committee provides financial advice. The Buildings and Works Committee advises the institute on matters relating to buildings and works activities. The compositions of these committees and boards, together with a list of other officers, are provided in the appendix.

### 2.2. Faculty and Staff Position

As on 31 March 2021, 598 faculty members and 584 non-faculty members were in position.

#### Number of faculty/staff in position

Faculty Members	Visiting Faculty	Group A Officer	Scientific Officer	Technical Staff	Administrative Staff
598	69	76	-	278	230

#### Number of faculty and employees appointed during 2020-2021

Professors	Associate Professors	Assistant Professors	Visiting Faculty and others	Administrative and Technical Staff (including Group A)
-	28	12	06	05

#### Faculty/Employees appointed between 1 April 2020 and 31 March 2021

S. No.	ID. No.	Name	Designation	Department/Section	Date of Joining
<b>Assistant Professor</b>					
1.	8963	Jayaraj Joseph	Assistant Professor Gr. I	Electrical Engineering	4 May 2020



2.	8964	Nishad Bharat Kothari	Assistant Professor Gr. I	Computer Science and Engineering	6 July 2020
3.	8966	Niravkumar Amrutlal Patel	Assistant Professor Gr. II (on contract for three years)	Engineering Design	11 August 2020
4.	8967	A J Ninitha Margret Julfiya	Assistant Professor Gr. I	Biotechnology	24 August 2020
5.	8968	Hema Chandra Kotamarthi	Assistant Professor Gr. I	Chemistry	27 August 2020
6.	8970	Ayon Chakraborty	Assistant Professor Gr. II	Computer Science and Engineering	24 September 2020
7.	8969	Shivananju	Assistant Professor Gr. I	Electrical Engineering	7 September 2020
8.	8972	Akanksha Agrawal	Assistant Professor Gr. II	Computer Science and Engineering	29 October 2020
9.	8973	Siva Rama Krishna Chaitanya Sharma Yamijala	Assistant Professor Gr. I	Chemistry	26 October 2020
10.	8974	Nathiya Muthalagu	Assistant Professor Gr. I	Biotechnology	1 March 2021
11.	8975	K G Vijay	Assistant Professor Gr. II	Ocean Engineering	22 March 2021
12.	8976	Nikhil Bugalia	Assistant Professor Gr. II	Civil Engineering	22 March 2021

**Associate Professor**

1.	8965	Babji Srinivasan	Associate Professor	Applied Mechanics	16 July 2020
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**Group A Officer**

1.	8971	A. Babu	Deputy Registrar	Administration	9 October 2020
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**Visiting faculty and others**

S. No.	Name	Designation	Department	Date of Joining
1.	Nikhil Bugalia	Visiting Faculty	Civil Engineering	17 August 2020 (relieved on 21 March 2021)
2.	M. A. Atmanand	Visiting Faculty	Electrical Engineering	6 October 2020
3.	Dr A. K. Varma	Professor of Practice	Mechanical Engineering	1 October 2020
4.	Mr Karthick Athmanathan	Professor of Practice	Mechanical Engineering	1 October 2020
5.	Mr P. G. Venkatram	Professor of Practice	Civil Engineering	1 September 2020
6.	Dr Prabhakar Varde	Professor of Practice	Mechanical Engineering	5 March 2021

**Internal faculty/employees appointed in higher grades during 2020-21**

S. No.	ID. No.	Name	Designation	Department/Section	Date of Joining
1.	8701	Dr Satyanarayanan Seshadri	Associate Professor	Applied Mechanics	19 March 2021
1.	8552	Dr S.K.M. Varadhan	Associate Professor	Applied Mechanics	19 March 2021

2.	8334	Dr Rajamanickam Murugan	Associate Professor	Biotechnology	19 March 2021
3.	8566	Dr Soumendra Nath Kuiry	Associate Professor	Civil Engineering	19 March 2021
4.	8661	Dr S.P. Atul Narayan	Associate Professor	Civil Engineering	19 March 2021
5.	8684	Dr Sumesh P Thampi	Associate Professor	Chemical Engineering	19 March 2021
6.	8674	Dr Chester Dominic Rebeiro	Associate Professor	Computer Science	19 March 2021
7.	8802	Dr Mitesh M Khapra	Associate Professor	Computer Science	19 March 2021
8.	8589	Dr Debductta Ray	Associate Professor	Electrical Engineering	19 March 2021
9.	8577	Dr Kamalesh Hatua	Associate Professor	Electrical Engineering	19 March 2021
10.	8798	Dr Uday Kiran Khankhoje	Associate Professor	Electrical Engineering	19 March 2021
11.	8503	Dr Sabuj Kumar Mandal	Associate Professor	Humanities and Social Sciences	19 March 2021
12.	8496	Dr R. Santhosh	Associate Professor	Humanities and Social Sciences	19 March 2021
13.	8602	Dr Joe Thomas Karackattu	Associate Professor	Humanities and Social Sciences	19 March 2021
14.	8568	Dr Mathangi Krishnamoorthy	Associate Professor	Humanities and Social Sciences	19 March 2021
15.	8833	Dr K. Hariharan	Associate Professor	Mechanical Engineering	19 March 2021
16.	8624	Dr S. Varunkumar	Associate Professor	Mechanical Engineering	19 March 2021
17.	8600	Dr Srikrishna Sahu	Associate Professor	Mechanical Engineering	19 March 2021
18.	8557	Dr Shyama Prasad Das	Associate Professor	Mechanical Engineering	19 March 2021
19.	8579	Dr S. Soundarapandian	Associate Professor	Mechanical Engineering	19 March 2021
20.	8560	Dr Manoj Pandey	Associate Professor	Mechanical Engineering	19 March 2021
21.	8575	Dr Anand Krishna Kanjarla	Associate Professor	Metallurgical and Materials Engineering	19 March 2021
22.	8520	Dr Manas Mukherjee	Associate Professor	Metallurgical and Materials Engineering	19 March 2021
23.	8603	Dr Varisha Rehman	Associate Professor	Management Studies	19 March 2021
24.	8494	Dr V. Vijayalakshmi	Associate Professor	Management Studies	19 March 2021
25.	8657	Dr Jayeeta Bhattacharyya	Associate Professor	Physics	19 March 2021
26.	8660	Dr Prabha Mandayam	Associate Professor	Physics	19 March 2021

**Group A Officers**

1	1196	Vijayalakshmi K	Deputy Registrar	Academic	25 September 2020
2	1973	Murali Prakash M	Executive Engineer (Electrical)	Engineering Unit	18 September 2020
3	8302	Porchelvi N	Senior Medical Officer	Hospital	18 September 2020
4	1972	Padmanabhan S	Assistant Executive Engineer (Telephones)	Engineering Unit	16 November 2020

**Internal faculty/employees appointed in higher grades during 2020-21**

S. No	ID No	Name	Designation	Department/Section	DOJ in Present Post
1	8582	Anita Mercy S	Senior Staff Nurse	Hospital	18 August 2020
2	8581	Jackulin C	Senior Staff Nurse	Hospital	18 August 2020
3	1199	V Govindarajan	Junior Superintendent	Chemistry	18 August 2020
4	1870	S M Fathima	Junior Superintendent	Stores and Purchase	18 August 2020
5	2185	Dilly M	Attendant (SS)	Mechanical Engineering	18 August 2020
6	8043	Vijayakumar S	Attendant (SS)	Mechanical Engineering	18 August 2020
7	8742	Gunam	Attendant	Electrical Engineering	18 August 2020
8	8743	Vasanthi N	Attendant	Central Library	18 August 2020
9	8744	Dhanalakshmi M	Attendant	Administration	18 August 2020
10	853	Elangovan S	Senior Assistant	Applied Mechanics	24 August 2020
11	8082	Tamilselvan K	Senior Assistant	Registrar's Office	24 August 2020
12	8610	Mohan Raj D	Senior Assistant	Training and Placement Office	24 August 2020
13	8611	Swaruparani B	Senior Assistant	Stores and Purchase	24 August 2020
14	8613	Tamilselvi T	Senior Assistant	Stores and Purchase	24 August 2020
15	8614	Karthika P T	Senior Assistant	Administration	24 August 2020
16	8615	Sumithra P	Senior Assistant	Academic	24 August 2020
17	8616	Sampath M	Senior Assistant	Finance and Accounts	24 August 2020
18	8620	Venkatesh P	Senior Assistant	Electrical Engineering	24 August 2020
19	8621	Anitha D	Senior Assistant	Administration	24 August 2020
20	8622	Prasana Kumar G	Senior Assistant	Communication Office	24 August 2020
21	8623	Kumudha Devi D P	Senior Assistant	Engineering Unit	24 August 2020
22	8625	Premanand C	Senior Assistant	Internal Audit	24 August 2020
23	8626	Deepa T G	Senior Assistant	Administration	24 August 2020
24	8628	Vijayakumar C	Senior Assistant	Recruitment Section	24 August 2020
25	8629	Kavitha B	Senior Assistant	Chemistry	24 August 2020
26	8631	Baskar J	Senior Assistant	Mechanical Engineering	24 August 2020
27	8633	Vidya R	Senior Assistant	Academic	24 August 2020
28	8636	Vengadeshkumar V	Senior Assistant	Civil Engineering	24 August 2020
29	8637	Padmini V	Senior Assistant	Academic	24 August 2020
30	8638	Boopathy B	Senior Assistant	Finance and Accounts	24 August 2020
31	8640	Ramachandran R	Senior Assistant	RTI and Legal Cell	24 August 2020
32	8641	Dhanasekar S	Senior Assistant	Taramani Guest House	24 August 2020
33	8643	Manjula E	Senior Assistant	Administration	24 August 2020
34	8645	Prabhakaran M	Senior Assistant	Academic	24 August 2020
35	8654	Vijayakumar K	Senior Assistant	Biotechnology	24 August 2020
36	1972	Padmanaban S.	Assistant Executive Engineer	Engineering Unit	16 November 2020

S. No	ID No	Name	Designation	Department/Section	DOJ in Present Post
37	8810	Sachin Kumar Sen	Security Inspector	Security Section	8 December 2020
38	8815	Lokesh G K	Security Inspector	Security Section	8 December 2020
39	8817	Sakthivel S	Security Inspector	Security Section	9 December 2020
40	8818	Kathiravan A	Security Inspector	Security Section	8 December 2020
41	8820	Swathi S	Security Inspector	Security Section	8 December 2020
42	8849	Santhosh S	Security Inspector	Security Section	8 December 2020
43	8851	Selvakumar C	Security Inspector	Security Section	8 December 2020
44	8852	Srisandhosh C	Security Inspector	Security Section	8 December 2020
45	8853	Deepan R	Security Inspector	Security Section	8 December 2020
46	8854	Subathra K	Security Inspector	Security Section	8 December 2020
47	8855	Thamarai Kannan S	Security Inspector	Security Section	8 December 2020
48	8856	Shiv Balak Kumar	Security Inspector	Security Section	8 December 2020
49	1015	U Somasundaram	Technical Superintendent	Physics	22 February 2021
50	8537	G Jayavel	PTI Gr. I	Gymkhana	24 February 2021

### Financial upgrade under MACPS

- Number of Group A Officers granted financial upgrade under MACPS: NIL
- Number of employees granted financial upgrade under MACPS: 07

### Faculty/Employees who resigned/relieved

S. No.	ID No.	Name	Designation	Department	Date of Relief
1	8911	Nimmakayala Uma Maheswara Reddy	Junior Technician	Physics	12 June 2020
2	8781	Gunda Koushik	Junior Technician	Engineering Unit	11 September 2020
3	8878	V K Raj Kumar	Junior Technical Superintendent	Chemical Engineering	29 October 2020 (w.e.f 31 December 2019)

### Faculty/Employees who opted for voluntarily retirement

S. No.	ID No.	Name	Designation	Department/Section	Date of Relief
1	1295	Sai Sudha D	Superintendent	Stores and Purchase	31 October 2020
2	0893	Yamuna T R	Technical Superintendent	Aerospace Engineering	31 October 2020
3	8049	Ravi D	Assistant Registrar	Administration	31 October 2020
4	0791	Chitra Sankar	Senior Assistant	Applied Mechanics	1 March 2021

**Faculty/Employees who superannuated between 1 April 2020 and 31 March 2021**

S. No	ID No.	Name	Designation	Department/Section	Date of Retirement
1	0672	Ravee D	Joint Registrar	Academic Section	30 April 2020
2	1103	Mohan C	Senior Security Inspector	Security Section	30 April 2020
3	1707	Pushparaj A	Office/Lab Assistant	Institute Gymkhana	30 April 2020
4	3106	Sundaravadivelu R	Professor	Ocean Engineering	31 May 2020
5	2738	Ramaprabhu S	Professor	Physics	31 May 2020
6	5010	Anju Chadha	Professor	Biotechnology	31 May 2020
7	1044	Dhanabalan M	Technical Officer (SS)	Physics	31 May 2020
8	1214	Mary Sabthiha Rani N	Assistant Registrar	Engineering Unit	31 May 2020
9	1275	Sasidaran A	Senior Technician	Physics	31 May 2020
10	1090	Selvavinayagam A V	Senior Library Technician	Central Library	31 May 2020
11	0987	Karunanidhi P	Senior Attendant	Physics	31 May 2020
12	0675	Sudarsanam A V	Joint Registrar	Internal Audit	30 June 2020
13	0614	Devarajulu K	Junior Superintendent	Institute Gymkhana	30 June 2020
14	0767	Dhanasekaran A	Senior Technician	Civil Engineering	30 June 2020
15	8932	Christopher S	Professor	Electrical Engineering	31 July 2020
16	2761	Ganesh L S	Professor	Management Studies	31 July 2020
17	2767	Malathy Duraisamy (Ms.) (Dr.)	Professor	Humanities and Social Sciences	31 July 2020
18	1160	Samma Roy	Matron	Institute Hospital	31 July 2020
19	0940	Lakshmi Veni A	Technical Superintendent	Applied Mechanics	31 July 2020
20	064	Devaki N	Technical Superintendent	Electrical Engineering	31 July 2020
21	0177	Jayachandran R	Technical Superintendent	Electrical Engineering	31 July 2020
22	1720	Ravanan D (Dr.)	Physical Training Instructor Gr. I	Institute Gymkhana	31 July 2020
23	1208	Prabhakaran M	Junior Superintendent	Engineering Design	31 July 2020
24	0265	Saranath P	Senior Technician	Electrical Engineering	31 July 2020
25	3105	Gandhi S R	Professor	Civil Engineering	31 August 2020
26	0771	Amudha N	Junior Technical Superintendent	Mechanical Engineering	31 August 2020
27	1055	Kulandaivelu Manoharan	Assistant Security Officer	Security Section	31 August 2020
28	1684	Subbarama Raju K	Senior Security Inspector	Security Section	31 August 2020
29	2679	Pandu Rangan C	Professor	Computer Science and Engineering	30 September 2020
30	0269	Suriyakumar R	Senior Technician	Metallurgical and Materials Engineering	30 September 2020

S. No	ID No.	Name	Designation	Department/Section	Date of Retirement
31	0889	Baba Thangavelu	Senior Technician	Mechanical Engineering	30 September 2020
32	2133	Usha K	Attendant	Ocean Engineering	30 September 2020
33	1991	Chandrakala K	Junior Attendant	Office of Communications and Public Relations	30 September 2020
34	1068	Jayakumar K	Senior Security Inspector	Security Section	31 October 2020
35	2259	Selvaraj V	Senior Technician	Engineering Unit	31 October 2020
36	0871	Balasundaram V S	Junior Assistant	Administration	31 October 2020
37	0312	Melchi Sedec A	Senior Attendant	GATE Office	31 October 2020
38	8264	Karunagaran D	Professor	Biotechnology	30 November 2020
39	1234	Vasanthy Thinakaran	Junior Superintendent	Internal Audit	30 November 2020
40	31	Surendran S.	Professor	Ocean Engineering	31 December 2020
41	1188	Padmini R	Superintendent	Office of the Dean (Students)	31 December 2020
42	1571	Gopinath C	Senior Attendant	Chemistry	31 December 2020
43	1066	Veldhas T	Senior Security Inspector	Security Section	31 January 2021
44	2535	Sangaranarayanan M. V.	Professor	Chemistry	28 February 2021
45	2205	Boominathan A	Professor	Civil Engineering	28 February 2021
46	42	Thirunavukkarasu K	Technical superintendent	Chemical Engineering	28 February 2021
47	85	Jeevanantham M	Senior Technician	Computer Centre	28 February 2021
48	3041	Bhattacharya S K	Professor	Ocean Engineering	31 March 2021
49	1609	Neelima M Gupte	Professor	Physics	31 March 2021
50	0252	Subramanian M K	Junior Technical Superintendent	Mechanical Engineering	31 March 2021

**Faculty/Employees who were on extraordinary leave/deputation/lien**

S. No.	Emp. Id.	Name	Designation	Department	Period		Reason and Type of Leave
1.	8320	Dr Gabbita Durga Janaki Ram	Professor	Metallurgical and Materials Engineering	30 January 2021	29 January 2022	Professor at IIT Hyderabad (Extension of Lien)
2.	3111	Dr D Janakiram	Professor	Computer Science and Engineering	23 December 2020	22 December 2023	Director at Institute for Development and Research in Banking Technology (IDRBT), Hyderabad
3.	8166	Dr Umakanth Dash	Professor	Humanities and Social Sciences	15 February 2021	14 February 2026	Director, Institute for Rural Management Anand (IRMA), Gujarat
4	8761	Revathi E	Junior Assistant	Administration	6 March 2020	5 August 2020	EOL on personal reasons
5	8895	Thamilarasi A	Staff Nurse	Hospital	19 May 2020	30 July 2020	EOL on personal reasons

**Faculty/Employees who passed away while in service**

S.No	Id. No	Name	Designation	Department	Date
1	8256	Amrendra Vijay	Professor	Chemistry	10 December 2020
2	293	Stevan Satyaraj K	Senior Attendant	Aerospace Engineering	25 May 2020
3	8691	Senthil Nagarajan V	Junior Technical Superintendent	Civil Engineering	13 November 2020

**Faculty/Employees who are on sabbatical**

S. No.	Name	Designation	Department	Period		Details
1.	Dr Krishna Moorthy Sivalingam	Professor	Computer Science and Engineering	1 July 2020	30 June 2021	Part-time Senior Research Scientist at NMSWorks Software Private Limited and COSGRID, Research Park, IIT Madras
2.	Dr Ganapathy Krishnamurthi	Associate Professor	Engineering Design	1 August 2020	23 May 2021	Book Writing

S. No.	Name	Designation	Department	From	To	Details
3.	Dr B Ravindran	Professor	Computer Science and Engineering	24 August 2020	31 July 2021	Visiting Researcher at Google India, Bangalore
4.	Dr S.R. Chakravarthy	Professor	Aerospace Engineering	15 January 2020	14 May 2021	To serve as Chief Technical Officer for co-founded startup company, Ubifly Technologies Private Limited (The ePlane Co.), IITM Research Park, Chennai
5.	Dr S Pushpavanam	Professor	Chemical Engineering	19 October 2020	15 October 2021	To set up a pilot plant to process e-waste in BHEL Trichy (DST grant project)
6.	Dr Santanu Sarkar	Assistant Professor	Mathematics	3 December 2020	2 December 2021	To visit Ruhr University, Bochum, Germany for availing AVH Fellowship
7.	Dr S Balaji	Professor	Electrical Engineering	4 January 2021	3 January 2022	i) Write a book on Optical Fiber Sensors ii) Visit to the University of Southampton, as part of SPARC iii) Work with a start-up company, Agalsearch System

### 2.3. Staff Welfare

#### Human resource development

As part of human resource development (HRD) activities, the institute plans and implements programmes for providing opportunities to technical and administrative employees to update and upgrade their knowledge and skills so that they may perform their duties effectively. The programmes are aimed at enhancing the pride and satisfaction they feel in their work, which in turn positively impacts their personal lives as well. These activities also form a part of the training requirements under the ISO dispensation.

The HRD activities were initiated in the institute in 1997 under the charge of a professor. In the period of reporting, three internal training programmes and one external training programme, organised by other institutions/organisations were attended by our employees

#### Training calendar for 2020-2021

S.No.	Training Programme	Number of Employees Benefited
<b>Outstation Training</b>		
1	Laboratory System and Internal Audit Program as per ISO/IEC 17025:2017	2



## Ongoing activities of Hindi Cell

The Hindi Cell at IIT Madras is functioning under the overall administrative control of the Registrar.

### a) Hindi training

In accordance with the directives of the Department of Official Language of the Home Ministry, GoI, Hindi Language Training classes were conducted regularly for both technical and administrative employees by Hindi Teaching Scheme. Despite the adverse situations due to COVID-19 pandemic in 2020-21, eight, five and seven employees successfully completed the Prabodh, Praveen and Pragya courses, respectively, through offline mode. Cash awards were given to 15 employees on passing the Hindi exams with creditable marks, and one-time increment was given to seven employees for passing Pragya examination.

### b) Hindi workshops and seminars

In 2020-21, three Hindi workshops were conducted online and offline, training 68 employees in conversational Hindi and practical knowledge of the day-to-day official work in the language. The employees were also apprised of the Official Language Policy and Rules by the Hindi Officers of various Central Government offices and PSU organisations. Many activity tests and interactive sessions were conducted.

### c) OLIC Meeting

The Official Language Implementation Committee (OLIC) meetings of IITM were convened regularly during the year under review in which achieving the targets prescribed for various items in the annual programme of Ministry of Home Affairs were discussed in detail. Follow-up actions were taken on the decisions made.

### d) Translation work

Translation of advertisements related to students' admission, teaching and non-teaching positions, RTI letters, accounts report, and other reports sent to the Ministry, invitations pertaining to Convocation and Institute Day, press releases, institute's main website, administrative website and confidential work assigned by the authorities were carried out during the year under review.

### e) Preparation of Help Literatures

Help Literatures are being prepared on routine and essential basis for effective and progressive use of Hindi. During the year, Help Literature consisting of technical and administrative terms used in sections, centres and departments were prepared and distributed.

### f) Celebration of Hindi Day

The Hindi Day was celebrated on 7 October 2020 through online mode and was presided over by the Registrar and Chairman, OLIC. The Registrar announced the prize winners of competitions such as Extempore, Simple Translation, Quiz on Dr APJ Abdul Kalam, Word Power, Identify the Picture, Say It In Hindi, and Hindi Music (Solo), which were conducted during the Hindi Fortnight. As part of cultural programme, Hindi songs were rendered by IITM students and spot activity was organised for the audience.

### g) Grant of annual incentive for doing official work in Hindi

One officer and 24 employees were awarded cash incentive under the 10,000 Words Incentive Scheme during the year.

### h) Other activities for effective implementation of Official Language

Following activities were conducted to maintain congenial atmosphere for Hindi and to create interest in Hindi among the staff:

- ❖ "Learn a Word in Hindi" is sent through email in three languages, Tamil, Hindi and English
- ❖ World Hindi Day was celebrated on 19 January 2021. A video-based quiz programme on the story Kabuliwala written by Shri Rabindranath Tagore was conducted for the staff.
- ❖ Rajbhasha Technical Seminar was organised wherein Dr Balendu Sharma Dadheech, Director, Microsoft (Localization) delivered lecture on the topic, Official Language and Artificial Intelligence
- ❖ A coordination meeting convened with the superintendents of Administration Section and Hindi coordinators of all departments/sections/centres was conducted on 10 March 2021 to increase the use of Hindi in official work.

### i) TOLIC Activities

IIT Madras actively participates in Town Official Language Implementation Committee (TOLIC) activities such as meetings, webinars and competitions. The staff participated in various competitions, such as Conversation, Extempore, Debate, Book Review, Noting and Drafting, Elocution, and Word Power conducted by TOLIC during the year. Shri Shivasharanappa, Junior Technician, Engineering Unit and Ms Saibani Sathapathi, Junior Assistant, Aerospace Engineering won second prize in the Conversation competition.

**Children Education Assistance**

The institute reimbursed a sum of Rs.1,39,83,750 to 518 faculty and staff members towards Children Education Allowance as per Government of India norms during April 2020 to March 2021.

**Insurance****Insurance schemes from 1 February 2020 to 31 January 2021****Group Mediciam Insurance Scheme**

Category/Numbers of Persons Covered	Employees/ Dependents	Pensioner/ Spouse	Family Pensioner
Basic coverage only opted	882	717	502
Basic + Additional coverage opted	332	378	59
Total number of dependents covered	3166	954	00
Total number of persons under coverage	4380	2049	561

<b>Total premium paid</b>	:	<b>Rs. 7,98,84,937</b>
<b>Total number of claims made</b>	:	<b>595</b>
<b>Total claimed amount</b>	:	<b>Rs. 7,08,89,415</b>

**Group Term Insurance Scheme**

Category	Life Insurance - Number of Persons Covered
Basic coverage opted	1149
Basic + Additional coverage opted	126
Total premium paid	Rs. 1,13,16,214
Total number of claims made	Three
Total claimed amount	Rs. 1,20,00,000

**Group Fire and Burglary Insurance Scheme**

Category	Life Insurance - Number of persons covered
Total premium paid	Rs. 42,93,772
Total number of claims made	Nil
Total claimed amount	Nil

**Faculty members and officers in the academic and general administration****I. Academic Administration**

Director	Prof. Bhaskar Ramamurthi
<b>Deans</b>	
Academic Courses	Prof. V. Jagadeesh Kumar
Academic Research	Prof. A. K. Mishra
Administration	Prof. Koshy Varghese
Industrial Consultancy and Sponsored Research	Prof. Ravindra Gettu
Industrial Consultancy and Sponsored Research (Associate Dean)	Prof. V. Kamakoti
Students	Prof. N.J. Vasa

Planning	Prof. Ligy Philip
Alumni and Corporate Relations	Prof. Mahesh Panchagnula
Global Engagement	Prof. Raghunathan Rengasamy

## II. Heads of Department

Aerospace Engineering	Prof. H. S. N. Murthy
Applied Mechanics	Prof. S. Ramakrishnan
Biotechnology	Prof. Guhan Jayaraman
Chemical Engineering	Prof. R. Nagarajan
Chemistry	Prof. K. Mangala Sunder
Civil Engineering	Prof. Manu Santhanam
Computer Science and Engineering	Prof. C. Chandra Sekhar
Electrical Engineering	Prof. David R. Koilpillai
Engineering Design	Prof. T. Asokan
Humanities and Social Sciences	Prof. Jyotirmaya Tripathy
Management Studies	Prof. G. Arun Kumar
Mathematics	Prof. V. Vetrivel
Mechanical Engineering	Prof. A. Seshadri Sekhar
Metallurgical and Materials Engineering	Prof. N.V. Ravi Kumar
Ocean Engineering	Prof. K. Murali
Physics	Prof. Arul Lakshminarayan

## III. Head of Research Centre

Sophisticated Analytical and Instrumentation Facility	Dr S. S. Bhattacharyya
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## IV. Head of Special Facilities for Interaction with Other Institutions

Centre for Industrial Consultancy and Sponsored Research	Dr Ravindra Gettu
Chairman, Centre for Continuing Education	Dr Devendra Jalihal
Central Electronics Centre	Dr V. Jagadeesh Kumar
Chairman, CC	Prof. P. Sriram
<b>Chairman</b>	
GATE	Prof. Raghuram Chetty
JEE	Prof. Edamana Prasad
Central Workshop	Prof. Shankar Krishnapillai

## V. Central Administration

Registrar	Dr Jane Prasad
<b>Deputy Registrars</b>	
Administration	Shri A Babu
Internal Audit	Smt. G. Chitrapavai

Finance and Accounts	Shri P. V. Karunakaran
Office of Dean (Students)/T&P	Shri Y.E.L. Sudhakar Rao Pujari
Academic Research	Shri P. Sarvaharna
Academic Courses	Smt K. Vijayalakshmi
IC&SR i/c	Shri B. Vijay Shankar
<b>Assistant Registrars</b>	
Stores & Purchase	Smt. Booma Sowrirajan
Administration - I & II	Smt. P. K. Sheba Sabari
Administration - III	Dr P. Arul
Communications and PR	Smt. Rashmi Uday Kumar
Finance and Accounts	Shri B. Vijay Shankar and Shri Raman Kumar
Recruitment	Shri R. Muralidharan
Academic	Smt Jayasri Sridhar
<b>Chief Security Officer</b>	Shri N. Elumalai
<b>Central Library</b>	
Librarian	Dr Mahendra N. Jadhav
Deputy Librarian	Dr M. Anandamurugan
Assistant Librarian	Dr K. Saravanan

## VI. Head of Central Services, Facilities and Section

Chief Medical Officer	Dr Rebecca Punithavalli
Chairman Council of Wardens	Dr Shaligram Tiwari
Vice Chairman Council of Wardens	Prof. T. Thyagaraj
Chairman, Committee for Monitoring General Facilities of Students	Dr Palaniappan Ramu
Advisor-MITr	Prof. Nilesh J Vasa
Co-Advisor-MITr	Dr Ramesh Gardas
Advisor-Saathi	Dr Sunetra Sarkar
Advisor-Cultural	Dr Arshinder Kaur
Advisor-Co-curricular	Dr S. Faruque Ali
Advisor-Sports	Prof. Benny Raphael
Advisor-Training and Placement	Prof. C. S. Shankar Ram
Advisor-Internship	Dr Sathyan Subbiah
Advisor-Weaker Section	Dr Saji K Mathew
Advisor- Extra Mural Lectures and T5E	Dr Preeti Aghalayam
Advisor-E-Cell	Dr Ashwin Mahalingam
Advisor-IAR Affairs	Dr Sachin S. Gunthe
Advisor-Career Development Cell	Dr Arun Menon
Advisor-NSS, Civil, Society Services	Dr Sivakumar. K.C



## 3

## Academic Programmes and Award of Degrees

In 2020-21, Indian Institute of Madras offered Ph.D. programme in all the 16 departments, M.S. programme in 12 departments, Interdisciplinary M.S./Ph.D., Joint Degree/Single Degree Ph.D., M.Tech programme (regular and web-based) in 39 streams/specialisations, M.Sc. programme in three branches, B.Tech programme in nine branches, Dual Degree (B.Tech and M.Tech) programme in 25 streams/specialisations and Dual Degree (B.S. and M.S.) in Biological Sciences and Physics. Other programmes offered by the institute were Inter-Disciplinary Dual Degree programmes in nine specialisations, M.B.A., E.M.B.A., M.A., Joint MBA. Integrated M.A. programme in two streams and a preparatory course for SC/ST/PwD students.

### 3.1 Admissions 2020-21

Candidates for admission to B.Tech., Dual Degree and M.Tech. programmes were selected through JEE (Advanced) and based on GATE score, respectively. Quite a few candidates were also selected for M.Tech. programme under Sponsored and User-Oriented Programmes through interview and/or written test. The selection for Ph.D. and M.S. programmes was done through test/interview. For M.Sc. branches of Mathematics, Physics, and Chemistry, the selection

was through a common test, JAM, conducted jointly by IITs. For M.B.A. programme, students were selected through CAT and interview; for M.A. Integrated Programme, the selection was made through Humanities and Social Sciences Entrance Examination or HSEE, a national-level entrance test conducted every year by IITM.

The number of students and scholars admitted to various programmes both in July 2020 and in January 2021 are given in the table.

**Table 1. Fresh Admission**

S. No.	Department	B.Tech	Dual Degree	M.Tech	Web-based M.Tech	PG Dip - MEM	M.Sc	M.B.A.	E.M.B.A.	M.A	.M.S.	Ph.D.	Total
1.	Aerospace Engineering	62	10	17							20	28	137
2.	Applied Mechanics			17							25	19	61
3.	Biotechnology		79	29							3	18	129
4.	Chemical Engineering	118		46							8	19	191
5.	Chemistry						56					49	105
6.	Civil Engineering	125		62							19	49	255
7.	Computer Science and Engineering	87		69	23						30	21	230
8.	Electrical Engineering	155		77	76						83	56	447
9.	Engineering Design		73								14	17	104

10.	Humanities and Social Sciences									51		17	68
11.	Management Studies					36		69	46		6	14	171
12.	Mathematics			27				42				11	80
13.	Mechanical Engineering	209		91	21						39	37	397
14.	Metallurgical and Materials Engineering	66		28							12	23	129
15.	Ocean Engineering	73		43							14	11	141
16.	Physics	43	13	12				45				41	154
	<b>Total</b>	<b>938</b>	<b>175</b>	<b>518</b>	<b>120</b>	<b>36</b>	<b>143</b>	<b>69</b>	<b>46</b>	<b>51</b>	<b>273</b>	<b>430</b>	<b>2799</b>

In addition, 56 students (GE PD: 10, EWS PD: 4, OBC PD: 9, SC PD: 3, ST: 30) joined the Preparatory Course.

#### Details of OBC/SC/ST and Women Students under Fresh Admission (programme and category wise)

S. No	Programme	EWS	OBC	SC	ST	PD	Female
1.	B.Tech/Dual Degree	94	263	144	67	18	194
2.	Dual Degree	18	51	26	8	-	37
3.	M.Tech.	59	144	74	38	23	80
4.	Online M.Tech	93	25	2	-	-	45
5.	M.B.A.	3	17	13	3	-	34
6.	EMBA	-	4	6	-	-	4
7.	M.Sc.	5	39	20	11	4	22
8.	M.A.	4	16	8	4	-	30
9.	PG Diploma in MEM	-	-	-	-	-	6
10.	PG Diploma in Metro Rail	-	-	-	-	-	-
11.	M.S.	20	70	21	-	1	40
12.	Ph.D.	20	107	50	5	1	139
	<b>Total</b>	<b>316</b>	<b>736</b>	<b>364</b>	<b>136</b>	<b>47</b>	<b>631</b>

As per Government of India orders, for the students coming from economically weaker sections (EWS) under General category, the EWS reservation is followed. For the academic year 2020-21, 10% reservation was given for EWS students under all programmes.

#### Total number of students admitted during the year included the following:

Foreign Nationals	2	Defence Officers (M.Tech)	28
EWS	316	User-Oriented Programme (M.Tech)	30
		Web-based M.Tech	120
OBC	736	Sponsored M.Tech	21
Scheduled Castes	364	Quality Improvement Programme (Q.I.P.)	Ph.D. 8
Scheduled Tribes	136	Project	M.S. 48
			Ph.D. 23
Physically handicapped	47	External registration	M.S. 3
Women students	631		Ph.D. 22

### 3.2 Students/Scholars Enrolment

The total numbers of students on roll in various programmes of the institute in the academic year 2020-21 are given below.

**Table 2. Students on roll**

S. No.	Department	B.Tech	Dual Degree	M.Tech	Web-based M.Tech	PG Dip - MEM	M.Sc	M.A	M.B.A.	EMBA	M.S	Ph.D	Total
1.	Aerospace Engineering	189	85	29							62	155	520
2.	Applied Mechanics			37							81	201	319
3.	Biotechnology	2	328	47							15	214	606
4.	Chemical Engineering	353	73	72							31	147	676
5.	Chemistry						116					277	393
6.	Civil Engineering	362	123	171							58	311	1025
7.	Computer Science and Engineering	297	45	136	81						104	91	754
8.	Electrical Engineering	439	222	153	270						247	315	1646
9.	Engineering Design		323								34	89	446
10.	Humanities and Social Sciences							243				144	387
11.	Management Studies					36			129	134	35	112	446
12.	Mathematics			41			84					113	238
13.	Mechanical Engineering	559	288	162	86						178	359	1632
14.	Metallurgical and Materials Engineering	190	47	50							42	166	495
15.	Ocean Engineering	197	63	71							51	156	538
16.	Physics	131	61	23			89					233	537
<b>Total</b>		<b>2719</b>	<b>1658</b>	<b>992</b>	<b>437</b>	<b>36</b>	<b>289</b>	<b>243</b>	<b>129</b>	<b>134</b>	<b>938</b>	<b>3083</b>	<b>10658</b>

The above total includes the following:

Foreign Nationals	10	QIP	Ph.D.	47
Economically Weaker Sections (EWS)	317	Sponsored	M.Tech	21
OBC	2943	Project	M.S. Ph.D.	109 105
Scheduled Castes	1256	External Registration	M.S. Ph.D.	25 114
Scheduled Tribes	506	Registration Kept Alive	M.S. Ph.D.	35 230
Physically Handicapped	127	Part-Time Programme	M.S. Ph.D.	12 56
Women students	2338	User-oriented Programme (M.Tech)		63
Defence Officers (M.Tech)	68	Web-based M.Tech		437



**Details of OBC/SC/ST and women students on roll (programme and category wise):**

S. No	Programme	EWS	OBC	SC	ST	PH	Female
1.	B.Tech	136	756	439	233	62	472
2.	Dual Degree	24	447	261	112	24	267
3.	M.Tech	82	304	133	71	14	150
4.	Online M.Tech	-	94	5	-	-	45
5.	M.Sc	-	87	43	23	4	53
6.	M.B.A	3	33	23	5	-	76
7.	EMBA	-	24	19	1	1	23
8.	M.A	4	71	42	20	8	142
9.	M.S	34	248	55	2	1	145
10.	Ph.D.	34	879	236	39	13	965
<b>Total</b>		<b>317</b>	<b>2943</b>	<b>1256</b>	<b>506</b>	<b>127</b>	<b>2338</b>

The branch/discipline-wise and year-wise details of students enrolled in B.Tech, Dual Degree and M.Tech programmes are given below.

**Table 3. B.Tech students on roll**

S. No.	Branch	2020	2019	2018	2017	2016 and Earlier Batch	Total
1.	Aerospace Engineering	60	49	42	28	10	189
2.	Biotechnology					2	2
3.	Chemical Engineering	118	95	69	61	10	353
4.	Civil Engineering	124	111	57	47	23	362
5.	Computer Science and Engineering	87	81	71	44	14	297
6.	Electrical Engineering	155	142	73	53	16	439
7.	Engineering Physics	40	31	30	24	6	131
8.	Mechanical Engineering	207	189	88	59	16	559
9.	Metallurgical and Materials Engineering	66	51	33	27	13	190
10.	Naval Architecture	72	57	34	27	7	197
<b>Total</b>		<b>929</b>	<b>806</b>	<b>497</b>	<b>370</b>	<b>117</b>	<b>2719</b>

**Table 4. Dual Degree (B.Tech and M.Tech) students on roll**

S. No.	Branch	2020	2019	2018	2017	2016	2015 and Earlier Batch	Total
1.	Aerospace Engineering	10	9	15	23	24	3	84
	Aerospace Engineering (B. Tech) and Applied Mechanics (M. Tech)						1	1
2.	Biotechnology:							
	Biological Engineering	39	33	33	30	30	9	174
	Biological Sciences (B.S. and M.S.)	34	28	26	31	23	12	154
3.	Chemical Engineering		1	16	29	25	2	73

4.	Civil Engineering			32	41	40	10	123
5.	Computer Science and Engineering			2	19	16	8	45
6.	Electrical Engineering			58	78	67	16	219
	Electrical Engineering (B.Tech) and Applied Mechanics (M.Tech)						3	3
7.	Engineering Design	72	62	56	56	56	21	323
8.	Mechanical Engineering		2	81	103	80	22	288
9.	Metallurgical and Materials Engineering			13	17	16	1	47
10.	Naval Architecture and Ocean Engineering		3	15	20	18	5	61
	Naval Architecture (B.Tech) and Applied Mechanics (M.Tech)						2	2
11.	Physics (B.S. and M.S.)	13	12	10	9	11	2	57
12.	Engineering Physics (IDDD)				3	1		4
	<b>Total</b>	<b>168</b>	<b>150</b>	<b>357</b>	<b>459</b>	<b>407</b>	<b>117</b>	<b>1658</b>

Table 5. M.Sc students on roll

S. No.	Branch	2020	2019	Extended	Total
1.	Chemistry	56	59	1	116
2.	Mathematics	33	43	8	84
3.	Physics	44	43	2	89
	<b>Total</b>	<b>133</b>	<b>145</b>	<b>11</b>	<b>289</b>

Table 6. M.Tech students on roll

S. No.	Department\Discipline\Batch	2020	2019	Extended Students	Total
1.	Aerospace Engineering	15	13	1	29
2.	Applied Mechanics				
	- Biomedical Engineering -Computational and Experimental Mechanics	6 8	5 18		37
3.	Biotechnology	12	12	1	25
	Clinical Engineering	14	8		22
	Bioprocess Engineering				
4.	Chemical Engineering	38	21		59
	CA - Catalysis Technology	7	4	2	13

	Civil Engineering				
	CE 1 - Building Technology and Construction Management	9	8	3	20
	CE 2 - Environmental Engineering	5	6		11
5.	CE 3 - Geotechnical Engineering	10	4		14
	CE 4 - Hydraulic and Water Resource Engineering	7	6		13
	CE 5 - Structural Engineering	22	13	1	36
	CE 6 - Transportation Engineering	9	6	2	17
	CE 7 - Construction Technology and Management	30	30		60
6.	Computer Science and Engineering	70	62	4	136
	Electrical Engineering:				
	EE 1 - Communication and Signal Processing	23	26	1	50
	EE 2 - Power Systems and Power Electronics	18	10		28
7.	EE 3 - Microelectronics and VLSI Design	12	10	1	23
	EE-4 - Control and Instrumentation	9	7		16
	EE-5 - Microelectronics and Photonics		5		5
	EE 6 - Integrated Circuits and Systems	14	11	1	26
	EE 13 - RF and Photonics	5			5
8.	Industrial Maths and Scientific Computing	24	17		41
	Mechanical Engineering:				
	ME 1 - Thermal Engineering	44	36	2	82
9.	ME 2 - Mechanical Design	27	17	2	46
	ME 3 - Manufacturing Engineering	24	10		34
10.	Metallurgical and Materials Engineering	29	19	2	50
	Ocean Engineering		13		13
11.	- Ocean Technology	11	7		18
	- Petroleum Engineering	16	7		23
	- Ocean Structure	17			17
12.	Physics:				
	- Functional Materials and Nanotechnology	13	9	1	23
<b>Total</b>		<b>548</b>	<b>420</b>	<b>24</b>	<b>992</b>

**Web-Based M.Tech**

1.	CS 102 - M.Tech Information Security (CSE)	23	30	28	81
2.	EE 101 - M.Tech Communication and Signal Processing		24	93	117
3.	EE 102 - M.Tech Integrated Circuits and Systems		23	47	70
4.	EE 105 - M.Tech Multimedia Signal Processing		6	1	7
5.	EE 106 - M.Tech Microelectronics	76			76
6.	ME 102 - Mechanical Design (Web based)	21			21
7.	ME 103 - M.Tech Automotive Technology		15	50	65
					<b>437</b>

**Table 7. M.B.A. students on roll**

S. No.	Branch	2020	2019	Total
1.	Management Studies	69	60	129

**Table 8. M.A. students on roll**

S. No.	Branch	2020	2019	2018	2017	2016	Total
1.	Humanities and Social Sciences	51	43	44	41	64	243

**Table 9. E.M.B.A. students on roll**

S. No.	Branch	2021	2020	2019	Total
1.	Management Studies	46	43	45	134

**Table 10. PG Diploma in Management for Executives in Manufacturing (PGDMEM) students on roll**

S. No.	Branch	2020	Total
1.	Management Studies	36	39

**Table 11. M.S. scholars on roll**

S. No.	Branch	Year I	Year II	Year III	Year IV	Year V and Others	Total
1.	Aerospace Engineering	20	19	11	6	6	62
2.	Applied Mechanics	25	27	11	15	3	81
3.	Biotechnology	3	6	1	3	2	15
4.	Chemical Engineering	8	9	9	2	3	31
5.	Civil Engineering	19	18	10	6	5	58
6.	Computer Science and Engineering	30	19	23	16	16	104
7.	Electrical Engineering	83	60	56	22	26	247
8.	Engineering Design	14	9	6	2	3	34
9.	Management Studies	6	15	4	5	5	35
10.	Mechanical Engineering	39	43	45	40	11	178
11.	Metallurgical and Materials Engineering	12	9	12	9		42
12.	Ocean Engineering	14	18	8	8	3	51
<b>Total</b>		<b>273</b>	<b>252</b>	<b>196</b>	<b>134</b>	<b>83</b>	<b>938</b>

**Table 12. Ph.D. scholars on roll**

S. No.	Branch	Year I	Year II	Year III	Year IV	Year V and Others	Total
1.	Aerospace Engineering	28	18	24	19	66	155
2.	Applied Mechanics	19	35	35	37	75	201
3.	Biotechnology	18	34	25	32	105	214
4.	Chemical Engineering	19	23	19	25	61	147

5.	Chemistry	49	38	52	32	106	277
6.	Civil Engineering	49	55	33	38	136	311
7.	Computer Science and Engineering	21	8	16	8	38	91
8.	Electrical Engineering	56	38	44	49	128	315
9.	Engineering Design	17	14	15	12	31	89
10	Humanities and Social Sciences	17	27	27	21	52	144
11	Management Studies	14	25	19	15	39	112
12	Mathematics	11	16	16	19	51	113
13	Mechanical Engineering	38	59	41	39	182	359
14	Metallurgical and Materials Engineering	23	16	37	22	68	166
15	Ocean Engineering	11	18	37	21	69	156
16	Physics	41	45	40	30	77	233
	<b>Total</b>	<b>431</b>	<b>469</b>	<b>480</b>	<b>419</b>	<b>1284</b>	<b>3083</b>

### 3.3. Courses offered

In the academic year 2020-21, 1,573 courses were offered of which 780 courses were offered during July-November 2020 and 793 courses were offered during January-May 2021. The department-wise details of the courses offered are given below:

**Table 13. Number of courses offered**

S. No.	Department	No. of Courses Offered in	
		July-November 2020	January-May 2021
		Core and Elective	Core and Elective
1	Aerospace Engineering	44	46
2	Applied Mechanics	44	40
3	Biotechnology	46	42
4	Civil Engineering	99	85
5	Chemical Engineering	48	47
6	Computer Science and Engineering	39	58
7	Chemistry	20	31
8	Engineering Design	32	33
9	Electrical Engineering	72	73
10	Humanities and Social Sciences	85	89
11	Mathematics	32	26
12	Mechanical Engineering	65	66
13	Metallurgical and Materials Engineering	34	44
14	Management Studies	17	12
15	Ocean Engineering	45	45
16	Physics	58	56
	<b>Total</b>	<b>780</b>	<b>793</b>

### 3.4 Convocation

The 57th Convocation was held on 25 September 2020 virtually due to COVID-19 pandemic. Dr David J Gross, Nobel Laureate and Chancellor's Chair of Theoretical Physics, University of California, graced the occasion as Chief Guest; 1,908 candidates were awarded various degrees in-absentia. The department-wise details of degrees awarded are given below.

Table 14. Degrees awarded

**Department wise number of Degrees  
57<sup>th</sup> Convocation  
Academic Year 2019-20, Part II \***

Sl. No	Dept.	Joint Degree		Dual Degree		Ph.D	M.S	M.Tech	Web-Based M.Tech	PGDMRTM	M.Sc	MBA	EMBA	MA	Dual Degree				B.Tech (Honours)	B.Tech	Total	
		M.S/ M.Tech	Ph.D.	M.S/ M.Tech/ M.Sc	Ph.D										B.Tech/ MS	B.Tech/ BS	M.Tech/ MS					
1	AE			6	6	3	5	27								18	18				24	107
2	AM			4	4	7	3	17														35
3	BT			1	1	18	1	13								33	33				1	101
4	CH			6	6	6	2	26								20	20			3	47	136
5	CY					25					48											73
6	CE			2	2	20	4	91		19						28	28			3	40	237
7	CS			4	4	10	4	47								4	4				33	130
8	EE	1	1	6	6	6	9	63	14							2	2			4	44	266
9	ED			3	3	4	1									37	37					85
1	HS					1								30								31
11	MS					7	2					48	37									94
12	MA					8		20			33											61
13	ME	1	1	9	9	25	6	51								1	1			5	57	298
14	MM	1	1	3	3	7		15								2	2			1	19	71
15	OE	1	2	3	3	9	1	32								1	1			1	35	113
16	PH	1	2	2	2	17		5			38					6	6				21	98
<b>Total</b>		<b>3</b>	<b>6</b>	<b>49</b>	<b>49</b>	<b>173</b>	<b>38</b>	<b>407</b>	<b>14</b>	<b>19</b>	<b>119</b>	<b>48</b>	<b>37</b>	<b>30</b>	<b>10</b>	<b>293</b>	<b>293</b>	<b>10</b>	<b>10</b>	<b>17</b>	<b>321</b>	<b>1936</b>

\* BoG dates (29.11.2019, 20.03.2020 & 17.07.2020)

**Department wise number of Degrees**  
**57<sup>th</sup> Convocation**  
**Academic Year 2020-21, Part I (BoG 25.09.2020)**

Sl. No	Dept.	Joint Degree		Dual Degree		Ph.D	M.S	M.Tech	M.Sc	Joint Degree MBA	MA	Dual Degree			B.Tech	Total
		M.S / M.Tech	Ph.D	M.S / M.Tech / M.Sc	Ph.D							B.Tech/ BS	M.Tech / MS	B.Tech / MS		
1	AE			4	4		3						1	1	9	22
2	AM			1	1	3	8									13
3	BT			1	1	10		11					9	9		41
4	CH			3	3	4	5	6							8	29
5	CY			2	2	5			1							10
6	CE			3	3	9	5						6	6	12	44
7	CS			6	6	2	11	3							13	41
8	EE			7	7	4	8	3					1	1	4	48
9	ED			3	3	2	6						10	10		34
1	HS					6					3					9
11	MS		1	1	1	4	2			3						12
12	MA				2											2
13	ME			10	10	11	14	1					3	3	8	60
14	MM			2	2	9	1								4	18
15	OE			1	1	5	2									9
16	PH	1	1	1	1	2			2				2	2	5	17
	<b>Total</b>	<b>1</b>	<b>2</b>	<b>45</b>	<b>45</b>	<b>78</b>	<b>65</b>	<b>24</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>35</b>	<b>68</b>	<b>409</b>

With this Convocation, the total number of degrees awarded so far by the institute is 56,176, including September 2020 graduands, the details of which are given below.

S. No.	Programme	Awarded up to Convocation 2019	Convocation 2020	Total
1.	Joint Dual Degree Ph.D	6	8	14
2.	Joint Single Degree Ph.D	-	4	4
3.	Dual Degree M.S. Ph.D	103 103	82 82	185 185
4.	Dual Degree M.Tech Ph.D	15 15	9 9	24 24
5.	Dual Degree M.Sc Ph.D	1 1	3 3	4 4
6.	Ph.D.	5112	251	5363
7.	M.S.	3732	103	3835
8.	M.Tech	15265	431	15696
9.	Web-Based M.Tech	-	14	14
10.	M.Sc.	3695	122	3817
11.	Joint Degree M.B.A (University of Passau, Germany)	-	3	3
12.	M.B.A.	1006	48	1054
13.	E.M.B.A	-	37	37
14.	MA	310	33	343
15.	Dual Degree (Incl. Honours) B.Tech M.Tech	2959 2959	313 313	3272 3272
16.	Dual Degree (Incl. Honours) B.S M.S	716 716	26 26	742 742
17.	B.Tech	16453	389	16842
18.	B.Tech (Honours)	176	17	193
19.	B.S.	1	-	1
20.	PGDMEM	140	-	140
21.	B.Sc. (Tech)	20	-	20
22.	DIIT	245	-	245
23.	PGDMRT	43	19	62
24.	PGDVLM	39	-	39
	<b>Total</b>	<b>53831</b>	<b>2345 Degrees (1908 Students)</b>	<b>56176</b>



### 3.5 Award of prizes to students

#### 3.5.1 Convocation Prizes

The following are the details of prizes awarded to the students at the 57th Convocation:

S. No.	Prize	Roll No	Awardee
1.	President of India Prize	EE16B033	Rajat Vadiraj Dwaraknath
2.	Bharat Ratna M Visvesvaraya Memorial Prize		
3.	Shri V. Srinivasan Memorial Prize	EE15B073	Alfred Festus Davidson
4.	Dr Shankar Dayal Sharma Prize	MM16B017	Arvind Pujari
5.	Governor's Prize	MM15B040	Hari Ramachandran
<b>B.Tech.</b>			
S. No.	Prize	Roll No	Awardee
6.	HAL Prize, Aerospace Engineering	AE16B039	Rudra Sethu Viji
7.	Reliance Heat Transfer Private Limited Prize, Chemical Engineering	CH16B009	Gangal Chinmay Shripad
8.	Larsen & Toubro ECC Endowment Prize, Chemical Engineering	CE16B033	J Eswar Avinash
9.	B Ravichandran Memorial Prize, Computer Science and Engineering	CS16B021	R Raghul
10.	Siemens Prize, Electrical Engineering	EE16B033	Rajat Vadiraj Dwaraknath
11.	Prof Achim Bopp Endowment Prize, Electrical Engineering	EE15B073	Alfred Festus Davidson
12.	Hema Balasubramanian Excellence Award, Engineering Physics	EP16B013	Chari Rajas Premanand
13.	Banco Foundation Prize, Mechanical Engineering	ME16B011	Dinesh Bompada
14.	Sivasailam Merit Prize, Mechanical Engineering	ME16B047	Surya R
15.	Dr Dhandapani Memorial Prize, Metallurgical and Materials Engineering	MM16B007	Kumaresh K R
16.	American Bureau of Shipping Prize, Ocean Engineering	NA16B020	Dhruv Bhagtani
		NA16B034	Relekar Hrishikesh Ajit
17.	Subramaniam Rajalakshmi Indira Endowment Prize, Chemical Engineering	CH16B061	Sajay V
<b>Dual Degree</b>			
S. No.	Prize	Roll No	Awardee
18.	Mayan Prize, Aerospace Engineering	AE15B036	S K Venkatesh
19.	Dr V Mohan Raman Prize, Aerospace Engineering		
20.	Biocon Prize, Biological Engineering	BE15B004	Anand A R
21.	Institute Merit Prize, Biological Engineering		

22.	The Divashri Award, Biological Science	BS15B010	Deepak
23.	B Ravichandran Memorial Prize, Chemical Engineering	CH15B016	Aswin Chandrasekar
24.	Dr N R Dave Prize, Civil Engineering	CE15B084	Nookala Harsha Vardhan
25.	Alumni Association Prize, Computer Science and Engineering	CS15B048	Kavya G
		CS15B061	Harshavardhan P K
26.	American Express Award, Computer Science and Engineering	CS15B048	Kavya G
27.	Philips India Prize, Electrical Engineering	EE15B073	Alfred Festus Davidson
28.	Prema and Nagaraja Setty Prize (converted from June 2014), Engineering Design	ED15B010	Deepak Prakash K
29.	Institute Merit Prize, Mathematics	HS15H021	Melwin James
30.	Prof G V N Rayudu (IIT Madras) Prize (renamed from August 2015), Mechanical Engineering	ME15B167	Aman Jalan
31.	American Express Top Achievement Award, Mechanical Engineering		
32.	Dr Susan Calvin Prize, Mechanical Engineering	ME15B112	Kamthe Aniket Anil
33.	S Anantharamakrishnan Memorial Prize, Metallurgical and Materials Engineering	MM15B022	Mythreyi Ramesh
34.	Institute Merit Prize, Metallurgical and Materials Engineering	MM15B040	Hari Ramachandran
35.	Prof J Sobhanadri Prize, Physics	PH15B008	Saran Vijayan
36.	Goodearth Shipbuilding Private Limited Prize, Ocean Engineering	NA15B039	Khare Akshay Dilip
37.	Institute Merit Prize, Ocean Engineering	NA15B022	Sambit Mishra

**P.G. Diploma**

S. No.	Name	Roll No	Awardee
38.	Smt. Jayalakshmi and Shri R Narasiman Prize	CE19G005	Piriya Saisujan

**M.A.**

S. No.	Prize	Roll No	Awardee
39.	Dr Dilip Veeraraghavan Memorial Award, HSS	HS15H021	Melwin James
40.	Prof. A V Krishna Rao Memorial Award, HSS	HS15H042	Teza M George
		HS15H007	Aswathy Venugopal

**M.Tech**

S. No.	Prize	Roll No	Awardee
41.	Air India Prize, Aerospace Engineering	AE18M023	Panduri Bhavya Naidu
42.	Prof. B V A Rao Endowment Prize, Applied Mechanics	AM18M007	Vinothkrishnan V
43.	Sushruta Award, Applied Mechanics	AM18M015	Pagadala Nalini

44.	Dr S S Srikanta Prize (Converted from August 2015) Biotechnology	BT18M020	Palika Charitha
45.	Dr K Subba Raju Memorial Prize, Chemical Engineering	CH18M012	Jishnusankar KS
46.	Shri S V Balakrishnan Prize, Chemical Engineering	CA18M004	Abhishek Sharma
47.	Mico-Bosch Prize, Chemical Engineering/Mechanical Engineering	ME18M058	Pushpak Yashawant Nemade
48.	Valli Anantharamakrishnan Merit Prize, Civil Engineering	CE18M086	Kalluri Asha Kiran
49.	K Devarajan Memorial Prize, Civil Engineering	CE18M126	Chaudhari Ankit Anil
50.	L&T Endowment Prize, Civil Engineering	CE18M052	Yugant Kapur
51.	CMC Prize, Computer Science	CS18M015	Bateesh
52.	Siemens Prize, Electrical Engineering	EE18M058	Priyatham Kattakinda
53.	Prof Achim Bopp Endowment Prize, Electrical Engineering	EE18M048	Mrinmoy Saha
54.	Prof Helmut Neunzert Endowment Prize, Mathematics	MA18M014	Nitish Dobhal
55.	Prof B Sengupto Prize, Mechanical Engineering	ME18M071	Sarthak Rastogi
56.	Dr S Vaidyanathan Memorial Prize, Mechanical Engineering	ME18M044	Kopparthi Mouli
		ME18M087	Anirudh B Krishnan
57.	S Anantharamakrishnan Merit Prize, Mechanical Engineering	ME18M048	Mahesh M S
58.	Prof Ramamohana Rao Memorial Prize, Mechanical Engineering	ME18M071	Sarthak Rastogi
59.	Sudharshan Bhatt Memorial Prize, Metallurgical and Materials Engineering	MM18M023	Supriya Anand
60.	Buti Foundation Gold Medal Award, Biotechnology	BT18M020	Palika Charitha
61.	American Bureau of Shipping Prize, Ocean Engineering	OE18M003	Amit Kumar Rathi
62.	Prof K A V Pandalai Prize, Ocean Engineering	OE18M016	Payal Mishra
63.	Shri RRP Sinha and Vimla Devi Prize, Ocean Engineering	PE18M002	Chekka Sri Durga Vidya Meghana
64.	Sri Krishnamurthy Sundarambal Prize, Physics	PH18M009	Swarnendu Banerjee
65.	American Express Award, Biotechnology	BT18M020	Palika Charitha
66.	Institute Merit Prize, Biotechnology	BT18M005	Arundhati Medya
67.	Institute Merit Prize, Biotechnology	BT18M020	Palika Charitha
68.	Institute Merit Prize, Civil Engineering	CE18M086	Kalluri Asha Kiran
69.	Institute Merit Prize, Ocean Engineering	OE18M003	Amit Kumar Rathi
<b>M.Sc.</b>			
<b>S. No.</b>	<b>Prize</b>	<b>Roll No</b>	<b>Awardee</b>
70.	Mira Paul Memorial Prize, Mathematics	MA18C037	Sourav Sarkar
71.	Prof Chilukury Rama Sastry Memorial Prize, Physics	PH18C003	Anant Rastogi
72.	Ratna Rao Memorial Prize, Chemistry	CY18C017	Deeksha
73.	Dr S R Ramadas 60th Birthday Commemoration Award, Chemistry	CY18C004	Anannya Banerjee

M.B.A.			
S. No.	Prize	Roll No	Awardee
74.	Coka Parthasarathy Prize, Management Studies	MS18A037	Santhosh Egappan R
75.	K V Arunkumar Memorial Prize, Management Studies	MS18A005	Chetan Agarwal
M.S./Ph.D.			
S. No.	Prize	Roll No	Awardee
76.	GE Ecomagination Excellence Award AE/AM/BT/CE/CH/CS/EE/ED/MA/ ME/MM/OE/PH	PH15D302	Ajay Piriya V S
77.	Prof. V Ramamurti Award, Applied Mechanics	AM14D403	Chandan Bose
78.	Sudharshan Bhat Memorial Prize, Metallurgical and Materials Engineering	MM15D012	Rahul M R
79.	Prof C N Pillai Prize, Chemistry	CY15D050	Naziya Parveen
80.	Prof G Sundararajan Endowment Prize, Chemistry	CY15D020	Soniya Gandhi
		CY15D056	Anup Mandal
81.	Prof Langmuir Prize, Chemistry	CY14D400	Kartik R CY13D202
82.	Prof Werner Prize, Chemistry	CY14D065	Koushik Saha CY14D070
83.	IBM Best Ph.D. Thesis Award, Computer Science	CS14D008	Jithin Vachery CS13D023 CS15D010
84.	Shree Gaayathree Devi Prize, Civil Engineering	CE15D036	Swathy Manohar
85.	Smt. Lakshmikutty Amma and Shri A Krishnankutty Nair Prize, Mathematics	MA16D012	Arvind Kumar
86.	Prof A L Lashkar Prize, Physics	PH13D040	Pradip Laha
		PH14D012	Pranab Parimal Biswas
87.	Bhagyalakshmi and Krishna Ayengar Award	ME15B081	Aman Vaibhav
		ED15B010	Sai Smruti Samantaray
		PH15D009	Deepak Prakash K
		BT14D001	Archanaa S
		OE13D211	Gaurav Pandey

### 3.5.2 Institute Day Prizes

The Institute Day 2021 award ceremony could not be conducted due to the pandemic.

## 4

# Departments

## 4.1. Department of Aerospace Engineering

### 4.1.1. Introduction

The Department of Aerospace Engineering was established in 1969 and has been offering B.Tech., M.Tech, M.S. and Ph.D. programmes. The areas of teaching and research of the department are aerodynamics and flight mechanics, propulsion and combustion, and aerospace structures.

### 4.1.2. Academic Programmes

B.Tech., Dual Degree (B.Tech.+M.Tech.), M.Tech., M.S. and Ph.D.

#### New courses introduced

Course No.	Course Title
AE01 NPTEL	Rocket Propulsion

#### Students on roll as of September 2019 + M.S. and Ph.D. admission in January 2020

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	60	49	42	28	---	179
Dual Degree	10	09	15	23	24	81
M.Tech.	15	13	--	---	---	28
M.S.	21	17	15	07	18	78
Ph.D.	28	18	19	21	89	175
Total	134	106	91	79	131	541

Number of Post-Doctoral Fellows: 08

**Students/Scholars who attended conferences/workshops/seminars/symposia abroad/  
India**

S. No.	Scholar	Roll No.	Conference/Seminar/Symposium/Workshop	Date and Venue	Financial Assistance from
<b>Abroad</b>					
1	S. Achu and Dr N.R. Vadlamani	Project Associate	AIAA SciTech 2021 Forum; paper: Entropically damped artificial compressibility solver using higher order finite difference schemes on curvilinear and deforming meshes	11 January 2021, virtual event	IIT Madras
2	Prerna Soni	AE17S013	AIAA SciTech 2020 Forum	6-10 January 2020, Orlando, Florida	IIT Madras
3	Dipanjan Majumdar	AE15D200	International Mechanical Engineering Congress and Exposition, USA	16-19 November 2020, USA, virtual conference	IIT Madras
4	Dipanjan Majumdar	AE15D200	73rd Annual Meeting of the American Physical Society Division of Fluid Dynamics, Chicago, USA	22-24 November 2020, USA, virtual conference	IIT Madras
5	Chhotelal Shah	AE17D413	International Mechanical Engineering Congress and Exposition, USA	16-19 November 2020, USA, virtual conference	IIT Madras
6	Chhotelal Shah	AE17D413	73rd Annual Meeting of the APS Division of Fluid Dynamics	22-24 November 2020, USA, virtual conference	IIT Madras
7	H.S. Varun	AE16D413	Nonlinear Dynamics Conference (NODYCON) 2021	16-19 February 2021	IIT Madras
8	R. Saurav	AE16B040	2020 International Conference on Unmanned Aircraft Systems	1-4 September 2020, Athens, Greece (online)	IIT Madras
9	Adhvaith Ramkumar	AE16B018	IEEE Conference on Decision and Control	14-18 December 2020, and Republic of Korea (online)	IIT Madras
10	Vrushabh Zinage	AE16B017	IEEE Conference on Decision and Control	14-18 December 2020, and Republic of Korea (online)	IIT Madras
11	Vrushabh Zinage	AE16B017	AIAA SciTech Forum	11-21 January 2021, virtual event (online)	IIT Madras
12	Kumar Rahul Dinkar	AE18S003	AIAA SciTech Forum	11-21 January 2021, virtual event (online)	IIT Madras
13	V.S. Shincy	AE18S017	AIAA SciTech Forum	11-21 January 2021, virtual event (online)	IIT Madras

## India

1	K.H. Chandra Vamsi, Dr N.R. Vadlamani	AE18M037	8th International and 47th National Conference on Fluid Mechanics and Fluid Power; paper: A high-order differential equation based unsteady wall distance solver	9-11 December 2020, IIT Guwahati, Assam, India	IIT Madras
2	Sumit Saravankar, Adrian Arasu, Dr N.R. Vadlamani	AE19S039	8th International and 47th National Conference on Fluid Mechanics and Fluid Power	9-11 December 2020, IIT Guwahati, Assam, India	IIT Madras
3	N. Ganesh, S.M. Ananth, Dr N.R. Vadlamani, R. Sriram and K. Kontis	AE19M017	8th International and 47th National Conference on Fluid Mechanics and Fluid Power	9-11 December 2020, IIT Guwahati, Assam, India	IIT Madras
4	Dipanjan Majumdar	AE15D200	GPU Application Hackathon 2020 (GAH 2020), organised by OpenACC.org in association with C-DAC, IIT Bombay and NVIDIA under the aegis of National Supercomputing Mission (NSM)	31 August-11 September 2020, online workshop	NA
5	Dipanjan Majumdar	AE15D200	NSM Workshop on High Performance Computing in Computational Fluid Dynamics, Indian Institute of Technology	1-3 December 2020, virtual	NA
6	Dipanjan Majumdar	AE15D200	HPC Shiksha: Basics of High-Performance Computing	9 November 2020-12 February 2021, virtual	Self-paid
7	Chhotelal Shah	AE17D413	NAFEMS in association with Rajarambapu Institute of Technology, Islampur, Maharashtra and Ramchandra College of Engineering, Eluru, AP, India	30 April-4 May 2020, Eluru, AP, India, virtual	Self-paid
8	Chhotelal Shah	AE17D413	GPU Application Hackathon 2020 (GAH 2020), organised by OpenACC.org in association with C-DAC, IIT Bombay and NVIDIA under the aegis of National Supercomputing Mission (NSM)	31 August-11 September 2020, online workshop	No expenses
9	Chhotelal Shah	AE17D413	HPC Shiksha: Basics of High-Performance Computing	9 November 2020-12 February 2021, virtual	Self-paid
10	Chhotelal Shah	AE17D413	Certified Machine Learning and AI course organised by Edvancer Eduventures and IIT Madras (virtual)	21 September-3 October 2020, IIT Madras, virtual	Self-paid
11	Varun H. S.	AE16D413	Certified Machine Learning and AI course, organised by Edvancer Eduventures and IIT Madras (virtual)	21 September-3 October 2020, IIT Madras, virtual	Self-paid
12	Sashank Modali	AE16B031	6th Conference on Advances in Control and Optimization of Dynamical Systems ACODS 2020	16-19 February 2020, IIT Madras	IIT Madras

**Students/Scholars who won outside prizes and awards**

S. No.	Student/Scholar	Roll No.	Prize	Prize awarded by
1	Krishna Manoj	AE15B019	INAE Best M. Tech Project Award	INAE
2	S.R. Siva Prasad Kochi	AE15D006	Best Paper Award	6th National Symposium on Shock Waves, February 2020

**Students/Scholars who won Institute Convocation/Institute Day Prize**

S. No.	Name	Roll No.	Prize	Prize awarded by
1	Amitesh Roy	AE16D412	Institute Research Award 2019-20	IIT Madras

**4.1.3. Faculty and Their Specialisations****Faculty**

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Dr M. Ramakrishna, Ph.D. (University of Texas at Arlington)	Fluid mechanics, numerical methods, computer solutions
Dr P. Sriram, Ph.D. (Institute Chair Professor) (Georgia Institute of Technology)	Structural mechanics, fatigue and fracture, parallel computing
Dr K. Bhaskar, Ph.D. (IIT Madras)	Structural mechanics, plates and shells, composite structures
Dr R.I. Sujith, Ph.D. (Institute Chair Professor) (Georgia Institute of Technology)	Thermoacoustic instability, optical flow diagnostics
Dr S.R. Chakravarthy, Ph.D. (Georgia Institute of Technology)	Propulsion, combustion and fluid mechanics
Dr R. Velmurugan, Ph.D. (IIT Delhi)	Composite structures analysis and design, impact mechanics, 3D composites
Dr Luoyi Tao, Ph.D. (University of Pittsburgh)	Continuum mechanics and its applications (fluids, solids, multiphase flows, etc.)
Dr H.S.N. Murthy ( <b>HEAD</b> ), Ph.D. (Purdue University)	Fatigue and fracture, non-destructive evaluation, tribology, advanced materials, elasticity
Dr Amit Kumar, Ph.D. (Case Western Reserve University)	Combustion, propulsion, fire research, CFD
Dr P.A. Ramakrishna, Ph.D. (Indian Institute of Science)	Combustion, propulsion
Dr Nandan Kumar Sinha, Ph.D. (IIT Bombay)	Dynamics and control of aerospace vehicles, aerial vehicle autonomy
Dr Sunetra Sarkar, Ph.D. (Indian Institute of Science)	Insect aerodynamics, fluid structure interaction, uncertainty quantification
Dr A. Sameen, Ph.D. (Indian Institute of Science)	Stability, transition and turbulence, computational fluid dynamics



Dr T.M. Muruganandam, Ph.D. (Georgia Institute of Technology)	Combustion, blowout dynamics, optical diagnostics, spectroscopic methods, vortex breakdown, dynamics of mode shifting, high speed flows, unsteady gas dynamics
Dr Sivasambu Mahesh, Ph.D. (Cornell University)	Structure-property modeling of aerospace materials
<b>Associate Professors</b>	
Dr G. Rajesh, Ph.D. (Andong National University, S. Korea)	Shockwave dynamics, ballistics, experimental gas dynamics
Dr Manikandan Mathur, Ph.D. (MIT, USA)	Instabilities and mixing, stratified and rotating flows, low-speed aerodynamics
Dr K.V. Nagendra Gopal, Ph.D. (Indian Institute of Science)	Computational mechanics and multi-scale modeling, fracture mechanics, structural dynamics and aeroelasticity
Dr Santanu Ghosh, Ph.D. (North Carolina University)	Computational fluid dynamics, turbulent flows, shock/ boundary-layer interaction, immersed-boundary methods
Dr Shantanu Shashikant Mulay, Ph.D. (Nanyang Technological University)	Continuum mechanics, large deformation of materials, fracture mechanics and plasticity
<b>Assistant Professors</b>	
Dr Ranjith Mohan, Ph.D. (Florida Atlantic University)	Helicopters, rotorcraft MAVs
Dr Shankar Ghosh, Ph.D. (University of Minnesota)	Hypersonic flow simulation, non-equilibrium effects, computational fluid dynamics, turbulent flows
Dr Shyam M. Keralavarma, Ph.D. (Texas A&M University)	Plasticity, ductile fracture, computational materials modeling, multiscale modeling
Dr Joel George, Ph.D. (IISc.)	Navigation, guidance and control of aerospace vehicles, multi-agent systems theory as applied to multiple unmanned aerial vehicle missions
Dr M. Senthil Murugan, Ph.D. (IISc.)	Aeromechanics, dynamics and aeroelasticity, stochastic systems
Dr Satadal Ghosh, Ph.D. (IISc.)	Guidance and control; motion planning
Dr Sriram Rengarajan, Ph.D. (IISc)	Experimental fluid dynamics, high speed flows, shockwave boundary layer interactions
Dr Vadlamani Nagabushana Rao, University of Cambridge (Robinson College)	Computational fluid dynamics, transition to turbulence, turbo machinery, high order methods, high performance computing
Dr Bharath M. Govindarajan, Ph.D., University of Maryland, College Park, USA	Computational aerodynamics of flow past bodies, mathematical and numerical modelling, algorithms and their applications, overall design of aerospace vehicles

### Short-term courses/workshops/seminars/symposia/conferences organised by the faculty members

S. No.	Coordinator(s)	Title	Period
<b>Seminar</b>			
1	Dr Shyam Keralavarma	Webinar series on Mechanics of Materials	September-December 2020
<b>Workshops</b>			
1	Dr Sunetra Sarkar and other faculty members	High Performance Computing (HPC) Workshop, 2020	27-29 July 2020
2	Dr Sunetra Sarkar and other faculty members	NSM Workshop on High Performance Computing in Computational Fluid Dynamics, 2020	1-3 December 2020
3	Dr Shankar K. Pillai, ME; Dr R. Velmurugan, AE	Indo-Korean workshop on Multifunctional Materials for Extreme Loading	22-24 February 2021
<b>Short-term courses</b>			
1	Dr Santanu Ghosh	Introduction to Shockwave/Boundary Layer Interactions	9-13 March 2020 (partly virtual)
2	Dr Nagabhshana Rao; Dr A. Sameen; Dr G. Rajesh	Theory and Analysis of Compressible Turbulence	22-27 March 2021

### Short-term courses/workshops/seminars/symposia/conferences/trainings attended by the faculty members in academic institutions and public sector undertakings

S. No.	Faculty Member	Title	Period and Venue
<b>Conferences</b>			
1	Dr Sunetra Sarkar (invited speaker)	Biomimetic Unmanned Systems	Vaishwik Bharatiya Vaigyanik (VAIBHAV) Summit 24 October 2020
2	Dr Sunetra Sarkar (invited speaker)	Aeroelasticity Vertical	VAIBHAV Summit 25 October 2020
3	Dr Sunetra Sarkar	a) Transitional Wake Dynamics of a Low-Aspect-Ratio Finite-Span Flapping Wing b) Bifurcation and Chaos in the Fluid-Structure Interaction Dynamics of a Dipteran Flight Motor	73rd Annual Meeting of the APS Division of Fluid Dynamics (virtual) 22-24 November 2020
4.	Dr Satadal Ghosh	2020 International Conference on Unmanned Aircraft Systems	Athens, Greece (online) 1-4 September 2020
5.	Dr Satadal Ghosh	IEEE Conference on Decision and Control	Republic of Korea (online) 14-18 December 2020

6.	Dr Satadal Ghosh	AIAA SciTech Forum	Virtual event	11-21 January 2021
7.	Dr Shyam Keralavarma	3rd Structural Integrity Conference and Exhibition (SICE 2020)	IIT Bombay	11-20 December 2020

**Training**

1.	Dr N.R. Vadlamani	C-DAC GPU Hackathon virtual event; led four-member team COMP-SQUARE to accelerate in house code on multi-GPUs		9-13 September 2020
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**Short-term courses**

1	Dr P.A. Ramakrishna	Combustion Concepts and Applications	S.V. National Institute of Technology, Surat	4 December 2020
2	Dr P.A. Ramakrishna	Understanding Solid Rockets Motors and Their Role in Futuristic Rocket Propulsion	SRM Institute of Science and Technology	17 October 2020

**Special lectures delivered by the faculty in other institutions**

S. No.	Faculty Member	Topic of Lecture	Institution	Date
1.	Dr P. A. Ramakrishna	Technology Ingestion into Armed Forces – A Holistic Approach	National Defense College	11 June 2020
2.	Dr P. A. Ramakrishna	Ingesting Technology in the Armed Forces	Naval War College	22 January 2021
3.	Dr Sunetra Sarkar	Aerodynamics of Drones and the Future Challenges	Madras Chamber of Commerce and Waterfall Institute of Technology Transfer	27 February 2021
4.	Dr G. Rajesh	Emerging Research Areas in Aerodynamics	Bannari Amman Institute of Technology, Sathyamangalam	4 August 2020
5.	Dr Satadal Ghosh	Introduction to Autonomous Systems, Motion Planning and Coordination of Autonomous Vehicles, Guidance Strategies for Autonomous Vehicles	National Design and Research Forum	8 October 2020
6.	Dr Satadal Ghosh	Autonomous Systems	PSG College of Technology	23 November-14 December 2020
7.	Dr Sriram Rengarajan	Shock Wave Boundary Layer Interaction	Hokkaido University (STSI Program)	18 December 2020
8.	Dr R.I. Sujith	Heart Attack and Combustion Instability: What is in Common?	Institute of Engineers, Coimbatore Centre	31 October 2020

## Fellowships of academic and professional societies

S. No.	Faculty Member	Year of Admission
<b>Humboldt Fellowship</b>		
1	Dr R.I. Sujith	2000
<b>INAE</b>		
2	Dr R.I. Sujith	2008
<b>Hans Fischer Senior Fellowship, Institute for Advanced Study, Munich, Germany</b>		
1	Dr R.I. Sujith	2010
<b>IASc Indian Academy of Sciences</b>		
1	Dr R.I. Sujith	2017

## Journal Editorial Boards

S. No.	Faculty Member	Position	Journal Name
1	Dr P.A. Ramakrishna	Member	<i>Defence Science Journal</i>
2	Dr P.A. Ramakrishna	Member	<i>Journal of Aerospace Sciences and Technologies</i>
3	Dr G. Rajesh	Associate Editor	<i>J Mechanical Science and Technology, Elsevier</i>
4	Dr Manikandan Mathur	Guest Editor	<i>Atmosphere-Ocean Dynamics of Bay of Bengal special issue (two volumes) of Deep Sea Research Part II</i>
5	Dr R.I. Sujith	Editorial Advisory Board	<i>Chaos</i>

### 4.1.4. Design and Development Activities

#### New facilities added or major equipment procured

S. No.	Equipment	Value (Rs. in lakh)
1	Software FEST-3D developed for CFD simulations with focus aerodynamic flows. The software has been made open source and hosted at <a href="https://fest3d.github.io/">https://fest3d.github.io/</a>	Open source
2	A Ballistic Range	2.8

## Patents

### Patents filed

S. No.	Faculty Member	Topic of Patent
1	Dr P.A. Ramakrishna	A low-temperature solid gas generator
2	Dr G. Rajesh	Sreelal M.R. and Dr G. Rajesh: A lift separation sabot for kinetic energy projectiles, Application No: 201941053745 (application status - pending external)
3	Dr R.I. Sujith	System and methods for passive control of oscillatory instabilities in turbulent flows

**Patents awarded**

S. No.	Faculty Member	Topic of Patent
1	Dr P.A. Ramakrishna	Process for surface coating of burn rate modifiers on ammonium per-chlorate and uses thereof
2	Dr P.A. Ramakrishna	Method for improving the mechanical properties of paraffin wax
3	Dr P.A. Ramakrishna	Hybrid rocket engine having high regression rate
4	Dr P.A. Ramakrishna	Wax-based disposable mandrel for solid propellant grain design

**4.1.5. Research and Consultancy****Sponsored research projects (ongoing and new)**

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1	Experimental investigation of aging-related issues in composite solid propellants	2	ISRO	26.628	Dr H.S.N. Murthy, AE
2	FEM analysis of pedestal components	1	BEL, Chennai	14.80	Dr H.S.N. Murthy, AE
3	Development of a backpack rocket	3	IMPRINT 2017	398.42	Dr Joel George, AE; Dr Balakrishna Rao, ED
4	Solid propellant combustion mechanisms and modeling	5	DRDO	2360	Dr S.R. Chakravarthy, AE; Dr Amit Kumar, AE; Dr T. Jayachandran, AE
5	Development of paraffin-GOX based hot gas generator for scale model applications	2.5	ISRO	31	NA
6	Development of low-temperature solid propellant-based gas generator for inflatable aerodynamic decelerator	1	ISRO	18.18	Dr Lazar Chitilappilly, AE
7	Development of extended range ammunition using Ramjet technology with precision guidance in artillery shells	3	ATB, Army	995.0	Dr M. Ramakrishna, Dr H.S.N. Murthy, Lt. Gen. P R Shankar, Dr G Rajesh, Dr Abhishek, IITK Dr. Mangal, IITK
8.	Numerical and experimental investigation of flow-separation control using passive mechanisms in high-speed flows	20 May 2019-19 November 2021	Ministry of Education	47,96,353	Dr Santanu Ghosh (Indian, PI); Dr T.M. Muruganandam (Co-I); Dr Venkateswaran Narayanswamy (Foreign, PI); Dr Jack R. Edwards (Foreign, Col)

9.	Bladeless smart wind energy harvesters	July 2018-July 2021	Department of Science & Technology	30	Dr Sunetra Sarkar (Co-PI); Dr Sayan Gupta; Dr Faruque Ali
10.	Complex systems and dynamics group	February 2021-December 2026	Ministry of Education	2.55	Dr Sunetra Sarkar (Co-PI); Dr Sayan Gupta; Dr Neelima Gupte
11.	Development of extended range ammunition using Ramjet technology with precision guidance in artillery shells	March 2020-September 2022	Ministry of Defence	995.00	Dr P.A. Ramakrishna (PI); Dr M. Ramakrishna (Co-PI); Dr H.S.N Murthy (Co-PI); Dr Gen. P.R. Shankar (Co-PI)
12.	Variable camber morphing wing	May 2017-May 2022	DRDO	1286.1	Dr Sameen A. (PI); Dr Manikandan M.S. (Co-PI); Dr Rinku Mukherjee (Co-PI); Dr Santanu Ghosh (Co-PI); Dr Shaikh Faruque Ali (Co-PI); Dr Shyam KeralaVarma (Co-PI); Dr A. Arockiarajan (Co-PI); Dr S.R. Chakravarthy (Co-PI); Dr BVSSS Prasad (Co-PI)
13.	Rotorcraft for scout operation at high altitudes and low air density region	3 March 2021-2 March 2024	PFMS	1,26,45,721	Dr Ranjith Mohan (PI); Dr Satadal Ghosh (Co-PI)
14.	Comprehensive experimental and simulation study on wildfire of BRICS countries: fire occurrence, spread and suppression	31 August 2020-30 August 2023	DST	46.572	Dr Amit Kumar (AE) and Dr V. Raghavan (ME)
15.	Theoretical prediction of minimum low oxygen flammability limit of polymers in microgravity	10 February 2020-17 February 2023	SERB	6.6	Dr Amit Kumar (AE)
16.	Experimental study of combustion in space environment	1 May 2019-20 April 2021	ISRO (VSSC)	28.62	Dr Amit Kumar (AE) and Dr T.M. Muruganandam (AE)
17.	Solid propellant combustion mechanisms and modelling	30 May 2017-30 May 2022	DRDO	2501.8172	Dr S.R. Chakravarthy, Dr P.A. Ramakrishna, Dr BVSSS Prasad, Dr Amit Kumar, and Dr T. Jayachandran

18.	Design and development of morphing wing with hingeless control surface (ongoing)	May 2017-May 2022	DRDO	514.54	Dr K.V. Nagendra Gopal (PI), Prof. R. Velmurugan, Dr Ranjith Mohan
19.	Microgrid Technologies (New)	February 2021-December 2026	Ministry of Education	320	Dr Krishna Vasudevan (PI), Dr K.V. Nagendra Gopal and 11 others
20.	Dynamic Mechanical Analyser (DMA), Differential Scanning Calorimetry (DSC) and Thermal Analyser (TA)	31 August 2020-30 August 2021	ICSR	4	Dr R. Velmurugan
21.	High strain rate studies of additively manufactured aerospace components	31 May 2019-30 November 2021	Ministry of Education	61	Dr R. Velmurugan, Dr R. Jayaganthan
22.	Toughened concrete for the use in structures of national importance against impact-SERB-TARE Scheme	22 February 2019-21 November 2021	DST	10.05	Dr R. Velmurugan
23.	JC Bose Fellowship	2019-2024	SERB	95	Dr R.I. Sujith
24.	Thermoacoustic Instability as Pattern Formation in a System Far from Equilibrium	2018-2021	ONRG	149.45	Dr R.I. Sujith

### Patents awarded

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1.	Dr Sunetra Sarkar	Development of a FSI solver for computing vortex induced vibration response of turbine towers	DNVGL, India	17.28
2.	Dr R. Velmurugan	Analysis and testing of composite materials	Common code	10

### RBIC projects (ongoing and new)

S. No.	Faculty Member	Title	Industry	Amount (Rs. In lakh)
1.	Dr G. Rajesh	Design of Sabot of 125mm FSA PDS PMT version with an aim of enhancing the depth of penetration to 550mm and above	Ordnance Factory Board (Ongoing)	87.74
2.	Dr G. Rajesh	CFD simulations of the flow through muzzle brakes and bore evacuator projectiles	Ordnance Factory Board (Ongoing)	56.4984
3.	Dr G. Rajesh	Design and development of 30 mm FSAPDS Ammunition	Ordnance Factory Board (supply order received, project yet to start)	157.353

4.	Dr Shyam Keralavarma	Experimental and numerical study of loading path effects on ductile fracture in nuclear steels	IGCAR, Kalpakkam	33.5
5.	Dr R.I. Sujith	Investigating the spatiotemporal dynamics of confined turbulent reacting flow close to lean blowout	Siemens Science & Technology	95.91

### Faculty members participation with other universities under MoU

S. No.	Faculty Member	Participation Details	University
1.	Dr Satadal Ghosh	Research and course programme collaboration	Queensland University of Technology, Australia
2.	Dr Amit Kumar	Coordinator and steering committee member for student exchange, faculty visits	Hokkaido University, Japan
3.	Dr R. Velmurugan	Joint Supervision	Glasgow University, UK

### Distinguished visitors to the department

S. No.	Visitor and Designation	Date of Visit	Purpose of Visit
1.	Dr Ianko Chterev	February-July 2020	Research collaboration with DLR Stuttgart, Germany

### Faculty visit

S. No.	Faculty Member	Designation	Date and Venue
1.	Dr T. Jayachandran	Visiting Faculty	1 January-31 December 2021
2.	Lt. Gen. P. Ravi Shankar	Professor of Practice	1 March 2021-28 February 2022
3.	Dr P.B. Navle	Professor of Practice	1 March 2021-28 February 2022
4.	Dr Lazar Chitilappilly	Professor of Practice	1 March 2021-28 February 2022
5.	Dr Venkateswaran Narayanswamy	Visiting Faculty under SPARC	February-March 2020
6.	Dr LU Guoxing	Visiting Faculty under SPARC	Aerospace Department, IITM
7.	Dr Dong Ruan	Visiting Faculty under SPARC	Aerospace Department, IITM
8.	Dr Philippe Odier	Visiting Faculty under SPARC	Aerospace Department, IITM
9.	Dr Thierry Dauxois	Visiting Faculty under SPARC	Aerospace Department, IITM
10.	Dr Jack Edwards	Visiting Faculty under SPARC	Aerospace Department, IITM



## 4.2 Department of Applied Mechanics

### 4.2.1 Introduction

The Department of Applied Mechanics has been in existence since 1962 and became a full-fledged interdisciplinary graduate research department over the years. The department focuses on academic activities in three broad areas of biomedical engineering, fluid mechanics and solid mechanics. The department also offers minor streams for undergraduate students.

### 4.2.2. Academic Programmes

Ph.D., Direct Ph.D., M.S. (by research), M.Tech. (Computational and Experimental Mechanics), M.Tech. (Biomedical Engineering), and Inter-Disciplinary Dual Degrees in Biomedical Engineering and Computational Engineering

### New courses introduced

S. No.	Course No.	Title
1	AM5515	Digital Healthcare Technology and its Applications

### New lab(s) established

Dr. Babji Srinivasan - Human in the Loop Cyber Physical Systems Lab

### Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
M.Tech.	13	20	-	-	-	33
M.S.	23	28	11	18	4	84
Ph.D.	16	34	34	39	78	201

### Student/Scholar who attended conferences/seminars/symposia/workshops abroad/India

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposium/Workshop	Date and Venue
<b>Abroad</b>				
1	R Samala	AM15D009	EGU General Assembly Conference Abstracts	May 2020, virtual
2	Ramkishore Sankaralingam	AM18D018	International Flow Battery Forum	January 2021
3	Manish Chandra	AM17D300	2020 OSA Optical Sensors and Sensing Congress	June 2020
4	Aravind Balachandran	AM16S027	2020 OSA Optical Sensors and Sensing Congress	June 2020

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposium/Workshop	Date and Venue
5	Rajanya Chatterjee	AM17D200	Chaotic, Modelling and Simulation Web Conference	22-24 October 2020, virtual
6	Aatif Sahab	AM18D404	31st European Symposium on Computer Aided Process Engineering (ESCAPE)	June 2021, Istanbul, Turkey, virtual
7	Amrutha V	AM18D002	58th Annual Rocky Mountain Bioengineering Symposium	8-10 April 2021, virtual
8	Divya Bharathi K	AM17D040	58th Annual Rocky Mountain Bioengineering Symposium	8-10 April 2021, virtual
9	Harikrishna M	AM19S040	58th Annual Rocky Mountain Bioengineering Symposium	8-10 April 2021, virtual
10	Himanshu Kumar	AM18D027	58th Annual Rocky Mountain Bioengineering Symposium	8-10 April 2021, virtual
11	Yedukondala Rao Veeranki	AM18D030	58th Annual Rocky Mountain Bioengineering Symposium	8-10 April 2021, virtual
12	Ravi Dadsena	AM15D002	58th Annual Rocky Mountain Bioengineering Symposium	8-10 April 2021, virtual
13	Shib Sundar Banerjee	AM16D206	58th Annual Rocky Mountain Bioengineering Symposium	8-10 April 2021, virtual
14	Sreelakshmi S	AM19D200	58th Annual Rocky Mountain Bioengineering Symposium	8-10 April 2021, virtual
15	Sukanta Kumar Tulo	AM18D300	58th Annual Rocky Mountain Bioengineering Symposium	8-10 April 2021, virtual
16	P. Vardhini	AM17D013	58th Annual Rocky Mountain Bioengineering Symposium	8-10 April 2021, virtual

**India**

1	Rahul Madbhavi	AM18D405	IEEE International Conference on Computing, Power and Communication Technologies (GUCON)	October 2020, New Delhi
2	Nilojendu Banarjee	AM19D005	47th Fluid Mechanics and Fluid Power Conference	December 2020, IIT Guwahati
3	Chauhan Hardikkumar Vasantbhai	AM18S009	47th Fluid Mechanics and Fluid Power Conference	December 2020, IIT Guwahati
4	Nilesh Kumar Jha	AM17S034	47th Fluid Mechanics and Fluid Power Conference	December 2020, IIT Guwahati
3	Harikrishna M	AM19S040	National Symposium on Instrumentation NSI - 42	28-29 December 2020, virtual
4	Sukanta Kumar Tulo	AM18D300	National Symposium on Instrumentation NSI - 42	28-29 December 2020, virtual
5	Navaneethakrishna M.	AM16D001	National Symposium on Instrumentation NSI - 42	28-29 December 2020, virtual
6	P. Vardhini	AM17D013	National Symposium on Instrumentation NSI - 42	28-29 December 2020, virtual

**Students/scholars who won outside prizes and awards**

S. No	Student/Scholar	Roll No.	Prize	Prize awarded by
1	Debadutta Subudhi	AM17D206	Best Conference Paper Award	IEEE Eurasia Conference on Biomedical Engineering, Healthcare and Sustainability
2	Divagar M	BT17D302	Gandhian Young Technology Innovation (GYTI-SRISTI) award	BIRAC
3	Sandeep Koundinya	AM18D033	CII-PMRF	

**Students/Scholars who won Institute Convocation/Institute Day Prize**

S.No.	Student/Scholar	Roll No.	Prizes	Donor
1	Anandu S.B.	AM16D205	Institute Research Award	Institute
2	Nijin I S	AM14D201	Institute Research Award	Institute
3	Aghna Mukherjee	AM16D406	Keshav Ranganath Award	Institute

**4.2.3. Faculty and Their Specialisation****Faculty**

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
S. Ramakrishnan, Ph.D. <b>(Head)</b>	Biomedical instrumentation, signal analysis, brain image analysis
Anuradha Banerjee, Ph.D.	Fracture and fatigue analysis in metals, composites, bio-materials, brittle materials
A. Arockia Rajan, Ph.D.	Smart materials, composites, material modelling, computational mechanics and experimental mechanics
Arul Prakash K., Ph.D.	CFD and heat transfer, LES and related techniques, thermal hydraulics, cooling technologies, biofluid dynamics
Arun Kumar Thittai, Ph.D.	Ultrasound imaging, HIFU application in therapy, acoustic radiation force application in mechanics, photoacoustics
A. Baburaj Puthanveetil, Ph.D.	Coherent structures in turbulent convection, interfacial phenomena and transport across membranes
C. Lakshmana Rao, Ph.D.	Impact mechanics, fracture mechanics, modelling of smart materials, numerical approach
Mahesh V. Panchagnula, Ph.D.	Spray combustion and atomization, surface tension phenomena, multiphase flows, active particles and systems
M. Manivannan, Ph.D.	Haptics, medical simulation, biomechanics, virtual reality, computational geometry and physiology
B.S.V. Prasad Patnaik, Ph.D.	Computational fluid dynamics, CFD tools for FSI, micro, bio-fluid flow systems

Name and Qualifications	Major Areas of Specialisation
M. Ramasubba Reddy, Ph.D.	Bio-signal processing, bio-instrumentation
K. Ramesh, Ph.D.	Digital photomechanics, fracture mechanics, computer applications in experimental mechanics
Sarith P. Sathian, Ph.D.	Rarefied gas flows and nanofluidics
Sayan Gupta, Ph.D.	Vibrations, nonlinear dynamics, probabilistic mechanics, structural reliability
M. S. Sivakumar, Ph.D.	Smart materials and structures, inelasticity/plasticity, fatigue of materials
N. Sujatha, Ph.D.	Biomedical imaging, speckle metrology, non-invasive tissue characterization
S. Vengadesan, Ph.D.	CFD and turbulence modelling - basics, advanced topics and applications to engineering problems, FSI, biofluid flows
<b>Associate Professors</b>	
Abhijit Chaudhuri, Ph.D.	Modelling hydrothermal systems, water waves, mass transfer in heterogeneous systems
Babji Srinivasan, Ph.D.	Cognitive systems engineering, neuroergonomics, human cyber physical systems, physiological cyber physical systems
Pijush Ghosh, Ph.D.	Nanomechanics, biomaterials, mechanics of thin films, molecular dynamics simulation
Raghavendra Sai V. V., Ph.D.	Biosensor for healthcare, fibre optic sensor and instrumentation, nanotechnology
Rinku Mukherjee, Ph.D.	Applied aerodynamics—flow modelling, unsteady wake phenomenon, dynamic stall and formation flight, CFD
Satyanarayanan S., Ph.D.	Aerosol mechanics, air quality - sensors, control equipment, renewable thermal energy - WHR/solar
Shaikh Faruque Ali, Ph.D.	Vibration and its controls, smart structures and energy harvesting
Vagesh D. Narasimhamurthy, Ph.D.	CFD, DNS, turbulence, transition, bluff body flows, premixed combustion, multiphase flows
Varadhan S.K.M., Ph.D.	Neural control of human movement, neuro mechanics and biomechanics
<b>Assistant Professors</b>	
Anubhab Roy, Ph.D.	Hydrodynamic stability, microhydrodynamics, geophysical flows, living fluids
Ganesh Tamadapu, Ph.D.	Mechanics of elastomers, encapsulated microbubbles, tensegrity structures
Ilaksh Adlakha, Ph.D.	Mechanical behavior of advanced materials, development of structure-property relationships, computational material science, data science for mechanics of materials
Saumendra Kumar Bajpai, Ph.D.	Cell mechanics, tissue mechanics, biophysics of tumours, vascular mechanics
<b>Adjunct Faculty</b>	
Anil Bajaj, Ph.D.	Nonlinear dynamics of structural systems, linear stability and dynamics of systems, MEMS designs using nonlinear resonances, flow-induced dynamics of elastic bodies
Alok Sinha, Ph.D.	Vibration, control systems, jet engines, robotics, neural engineering and nanotechnology

### Short-term courses/workshops/seminars/symposia/conferences organised by the faculty members

S. No.	Coordinator(s)	Title	Period
<b>Seminars</b>			
1	Dr Satyanarayan Seshadri	One Step at a Time, 12-session seminar series on Entrepreneurship	May-June 2020
2	Dr Sayan Gupta	Effects of noise on nonlinear dynamical systems	13 January 2020
<b>Symposium</b>			
1	Dr Sayan Gupta	Mini symposium on Nonlinear dynamics and chaos for energy harvesting and diagnostics	22-24 October 2020
<b>Workshops</b>			
1	Dr Satyanarayan Seshadri	Energy Vertical of the Vaibhav Summit	November 2020
2	Dr Babji Srinivasan	Data Analytics, Risk and Technologies (DART) lab inauguration workshop	3-4 September 2020
<b>Short-term courses</b>			
1	Dr Abhijit Chaudhuri	Porous Medium Theories and Applications (PMTA)	January 2020
2	Dr Babji Srinivasan	Business Analytic Models	November 2020-January 2021
3	Dr Arun Thittai	NPTEL course	

### Short-term courses/workshops/seminars/symposia/conferences/trainings attended by faculty members in academic institutions and public sector undertakings

S. No.	Faculty Member	Title	Institution	Period
<b>Workshop</b>				
1	Dr Babji Srinivasan	Five-day e-workshop on Renewable Energy Grid Integration- Challenges and Operational Strategies	Department of Electrical and Electronics Engineering, NIT Tiruchirappalli	18-22 January 2021
<b>Conferences</b>				
1	Dr Babji Srinivasan	9th PSE ASIA conference	Taiwan	4-6 November 2020
2	Dr Babji Srinivasan	7th IEEE World Forum on the Internet of Things	New Orleans, USA	14 June-31 July 2021
3	Dr Babji Srinivasan	IEEE International Conference on Computing, Power and Communication Technologies (GUCON)	New Delhi	2-4 October 2020
4	Dr Arul Prakash	8th International and 47th National Conference on Fluid Mechanics and Fluid Power	IIT Guwahati	9-11 December 2020

S. No.	Faculty Member	Title	Institution	Period
<b>Trainings</b>				
1	Dr Babji Srinivasan	ATAL Faculty Development Program	Department of Electrical and Electronics Engineering, NIT Kozhikode	1-5 February 2021
2	Dr Babji Srinivasan	FDP program on Modern Control Techniques for Power and Energy Systems	Department of Electrical and Electronics Engineering, NIT Kozhikode	7-12 September 2020

### Special lectures delivered by the faculty in other institutions

S. No.	Faculty Member	Topic of Lecture	Institution	Date
1	Dr Abhijit Chaudhuri	Geothermal Energy and Carbon Geo-sequestration: (Overview, Modeling and Insights)	Virtual International Conference on Sustainable Energy Solutions for a Better Tomorrow (SESBT 2020), VIT Chennai	23 July 2020
2	Dr Satyanarayan Seshadri	Customer Discovery and User Research Techniques	Biz-Tech Bootcamp organised by AIC-RMP in collaboration with MathWorks	30 July 2020
3	Dr Sayan Gupta	Effects of Noise in Nonlinear Dynamical Systems	Center for Applied Dynamics Research, University of Aberdeen, UK	6 November 2020
4	Dr Babji Srinivasan	Keynote lecture	9th PSE ASIA conference, Taiwan	4-6 November 2020
5	Dr Babji Srinivasan		7th IEEE World Forum on the Internet of Things, New Orleans, USA	14 June-31 July 2021
6	Dr Babji Srinivasan	Advanced Control Systems	ATAL Faculty Development Program, Department of Electrical and Electronics Engineering, NIT Kozhikode	1-5 February 2021
7	Dr Babji Srinivasan	Talk	IEEE International Conference on Computing, Power and Communication Technologies (GUCON), New Delhi	2-4 October 2020
8	Dr Babji Srinivasan	Modern Control Techniques for Power and Energy systems	Department of Electrical and Electronics Engineering, NIT Kozhikode	7-12 September 2020
9	Dr Arul Prakash	Invited talk in TEQIP-III sponsored short-term course on Introduction to Computational Fluid Dynamics	Department of Mechanical Engineering, IIT Indore	28-30 December 2020

## Journal Editorial Boards

S. No.	Faculty Member	Position	Journal Name
1	Dr Abhijit Chaudhuri	Editorial board member	<i>Geomechanics and Geophysics for Geo-Energy and Geo-Resources</i>
2	Dr Sayan Gupta	Associate Editor	<i>Proceedings of Indian Academy of Science</i>
3	Dr Ramakrishnan S	Associate Editor	<i>Frontiers in Signal Processing</i>

### 4.2.4. Design and Development Activities

#### Brief and specific details of process/instruments/equipment/software designed and developed

Dr Abhijit Chaudhuri is developing a multiphysics simulation code for geothermal, oil and gas exploration from subsurface reservoirs, and an experimental set-up for roto-dynamics RO filtration system. The set-up can be used for testing effectiveness of new RO membranes.

Dr Satyanarayan Seshadri is developing a steam expander for process steam applications, laser-induced breakdown spectroscopy (LIBS) for power sample characterization, electrochemical workstation for flow battery testing, optical absorption facility for gas concentration measurement, and steam quality measurement system for geothermal steam.

Dr Babji Srinivasan is developing a multi-screen eye tracking system (hardware, software and analytics)

for use in complex cyber physical systems. This system can be used to monitor the performance of humans in complex environments such as aviation, nuclear and process industries. The analytics developed based on the data from eye tracker can provide information about the cognitive aspects such as workload, situation awareness and decision-making behaviour of humans in their complex workplace environments. Dr Arul Prakash is designing, developing and testing “next-generation heat exchangers” using novel techniques through metal additive manufacturing as a part of sponsored project through IMPRINT-1 scheme (Ministry of Education and DHI), he has a technology demonstration of “air filtration” for defence applications as a part of sponsored project from DRDO (CVRDE and RIC). He also developed a software to estimate thermal load in solid propellant vertical mixer for space applications as a part of a sponsored project from ISRO (SHAR-Sriharikota). This software is successfully tested in SHAR facility at Sriharikota.

#### New facilities added or major equipment procured

S. No.	Equipment	Value (Rs. in lakh)
1	Split Hopkinson Pressure Bar	
2	Malvern Particle Sizer	
3	High-Temperature and High-Pressure Steam Oxidation Facility	
4	Installed a water tunnel was installed at the Biomimetics Lab in Aerospace Engineering	Partial support from DST, departmental funds and institute funds
5	Remote eye tracking system - Aurora, from Smarteye© Sweden, as part of project support from DART lab, IIT Madras	

## Patents

### Patents filed

S. No.	Faculty Member	Topic of Patent
1	Dr Satyanarayan Seshadri	Methods and device to enhance the Laser-Induced Breakdown Spectroscopy (LIBS) signal during elemental/molecular analysis of powder samples IDF 2116
2	Dr Satyanarayan Seshadri	Two-stage regenerative Organic Rankine Cycle (ORC) heat recovery-based power generation system PCT/IN2021/050178
3	Dr S. Vengadesan	An Entomopter and upstream condition based flight control algorithm with high-fidelity pre-simulated database; application number - 202041051026

**4.2.5. Research and Consultancy****Sponsored research projects (ongoing and new)**

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1	Compressed sensing based affordable ultrasound scanner platform	27 March 2019-26 March 2022	Science and Engineering Research Board	30.29	Dr Arun K. Thittai
2	Solvent-triggered changing biopolymer films: experimental and numerical design	19 March 2019-18 March 2021	Department of Science & Technology	5.9	Dr Pijush Ghosh
3	Transition to turbulence in rough Couette flows	25 March 2019-24 March 2022	Science and Engineering Research Board	26.77	Dr Vagesh D. Narasimhamurthy
4	Shear-layer instabilities in the turbulent wake from normal flat-plates	23 April 2019-22 April 2021	Science and Engineering Research Board	19.2	Dr Vagesh D. Narasimhamurthy
5	Investigation of nanoscale heat transport at solid-liquid interfaces for engineering-tailored nanostructures in thermal interface systems	31 December 2019-30 December 2022	Ministry of Education	48.44	Dr Sarith P. Sathian
6	Development of assessment protocols for aspiring athletes using surface electromyographic signals	3 February 2020-2 February 2023	Science and Engineering Research Board	20.28	Dr Ramakrishnan S.
7	Developing interface between clay and concrete applying polymers	6 March 2020-5 June 2023	Science and Engineering Research Board	46	Dr Pijush Ghosh
8	Development of a lossy mode resonance based fiber optic biosensor array platform for ochratoxin-A detection in foods	1 May 2019-30 April 2021	Science and Engineering Research Board	19.2	Dr Raghavendra Sai V. V.
9	Aerosol transport in the deep lung to enable personalized pulmonary drug delivery (P2D2)	30 April 2019-29 April 2021	Scheme for Promotion of Academic and Research	97.24	Dr Satyanarayanan Seshadri
10	Estimation of thermal load due to mixing in 10t vertical mixer	1 May 2019-31 October 2020	Indian Space Research Organisation	19.8	Dr Arul Prakash K.
11	An automated digital staining machine for immediate detection of cancerous cells and its extent for usage during perioperative tumour removal	1 April 2019-31 March 2021	Indian Council For Medical Research	11.78	Dr Sujatha N.



12	Speech assistive gloves for post-traumatic care of people with compromised ability to vocally communicate	15 July 2019-14 July 2021	Department of Science and Technology	40.58	Dr Varadhan S.K.M.
13	1 Lab - 1 School: Taking STEM to rural schools in India	27 June 2019-26 June 2022	Department of Science & Technology	32.31	Dr Pijush Ghosh
14	Development of non-invasive and affordable liver stiffness imaging device and clinical evaluation of its utility for metabolic disorders	8 July 2019-8 June 2022	Department of Science & Technology	59.22	Dr Arun Kumar Thittai
15	Non-invasive transdermal collagen and perfusion sensor for cosmetic and diagnostic applications	3 September 2019-2 September 2021	Department of Science and Technology	43.44	Dr Sujatha N.
16	Centre of Excellence in Medical Device Regulations and Standards	April 2021-April 2023	Ministry of Human Resource Development	315	Dr Ramakrishnan S.
17	Design and development of a multi-array sensor for assessment of muscle fatigue and activity status for rehabilitation	December 2018-December 2021	Department of Science and Technology, Science and Engineering Research Board - TARE	3.35	Dr Ramakrishnan S.
18	Modelling and analysis of mistuned rotor blade systems	2017-2021	DRDO	86.29	Dr Sayan Gupta
19	Development of HPC tools for CFD-based patient specific management of cerebral aneurysms	29 March 2021	National Supercomputing Mission	25.74	Dr Prasad Patnaik B.S.V.
20	Development of WBG-based integrated drive system for electric vehicles (evIDS)		Centre for Development of Advance Computing (CDAC)	63.98	Dr Arul Prakash K.
21	Energy-efficient tyre curing process		Apollo Tyres	35.95	Dr Arul Prakash K.
22	Reduced 1D model for measuring fractional flow reserve and in-vitro validation		GCRF - Swansea University	6.4	Dr Arul Prakash K.
23	A novel DEM-CFD approach to model particle scale heat transfer	February 2021-Present	Department of Science and Technology	15.35	Dr S. Vengadesan

24	DEMO-Multi-WAP on fiber optic array biosensor for multiplexed detection waterborne pathogens	March 2020-August 2022	IGSTC	107	Dr Raghavendra Sai V. V.
25	Nano-Synth-Sens on high-throughput synthesis of non-spherical plasmonic nanoparticles for applications in sensing	February 2021-February 2024	Department of Science and Technology	41.7	Dr Raghavendra Sai V. V.
26	Complex Systems and Dynamics Group	2021-2026	Ministry of Education	255	Dr Sayan Gupta
27	Bladeless smart energy wind harvesters	2018-2022	DST	30.96	Dr Sayan Gupta
28	Advanced optimization strategies for efficient water and energy utilization	June 2019-June 2021	DST-SPARC	85	Dr Babji Srinivasan
29	A framework for quantifying the resilience of complex networks: applications to water distribution networks and power grids	June 2019-June 2021	DST-SPARC	75	Dr Babji Srinivasan
30	Human-in-the-loop analytics for operator learning: knowledge assessment through eye tracking	September 2020-September 2021	DART Lab, IIT Madras	5.74	Dr Babji Srinivasan
31	Cost-effective eye tracking approaches to analyze human-machine-interface in nuclear power plants	September 2020-September 2022	BRNS	35.75	Dr Babji Srinivasan
32	Fundamental limitations for unordered signal sensing in the presence of noise	February 2020-February 2023	SERB MATRICS proposal	6.60	Dr Babji Srinivasan
33	Cognitive workload assessment of teams operating in human-in-the-loop cyber physical systems using physiological and behavioral measures	June 2021-June 2023	New Faculty Startup Grant, IIT Madras	25	Dr Babji Srinivasan
34	Indian dataset for automatic facial emotion recognition	Yet to start, funding approved	DART lab, IIT Madras	5.30	Dr Babji Srinivasan
35	Modelling and analysis of mistuned rotor blade systems	2017-2021	DRDO	86.29	Dr Sayan Gupta

**Industrial consultancy projects (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Dr Manivannan M.	Novel technology for training in reduction of infant mortality rate in rural India	India Ideas.com Limited	350
2	Dr Arockiarajan A.	Mechanical testing of samples	Common Code	5
3	Dr Satyanarayanan Seshadri	Development of dust monitoring system using light scattering principle for stack monitoring	Engineers India Limited	22
4	Dr Satyanarayanan Seshadri	Desktop water jet system for offshore applications	Engineers India Limited	22
5	Dr Satyanarayanan Seshadri	Industrial Energy Assessment	Strides Pharma	
6	Dr Satyanarayanan Seshadri	Industrial Energy Assessment Cell	AAAA Common Code project	

**RBIC projects (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Dr Satyanarayanan Seshadri	Development of IoT enabled thermal energy monitoring solutions for heat pump and hot water generation systems	Aspiration Energy Private Limited	12
2	Dr Satyanarayanan Seshadri	Development of cold storage boxes - TAN90	Entrepreneurship Development and Innovation Institute	3.75
3	Dr Satyanarayanan Seshadri	Development of steam quality sensor for geothermal applications	Fuji Electric	
4	Dr Satyanarayanan Seshadri	Future Refrigeration India	INDEE+	
5	Dr Arun Kumar Thittai	Design and development of a computer vision based automatic visual inspection system for moulded rubber products	Scorpion Industrial Polymers Private Limited	7.08
6	Dr Varadhan S. K. M.	Validation of sensors to identify and measure knee varus thrust, an indicator of osteoarthritis development and progression	University of Sydney	2.4
7	Dr Raghavendra Sai V. V.	Plasmonic fiberoptic competitive immunosensor for tetrahydrocannabinol - a proof of concept study	Ricovr Healthcare Inc	10.5
8	Dr Abhijit Chaudhuri	Design of easily deployable wave powered RO desalination system	U.S. Department of Energy Water Power Technologies Office through University of Hawaii	USD 24988
9	Dr Sayan Gupta	Development of a FSI solver for computing vortex induced vibration response of turbine towers	DNV	17.28

10	Dr Babji Srinivasan	A framework for data label propagation in industrial settings using active learning approaches	Viking Analytics, Sweden	13.50
11	Dr Babji Srinivasan	DOT - A small form factor WI-FI enable sensor technology for healthcare applications	DOT IOT Technologies Private Limited	70
12	Dr Arul Prakash	Energy Efficient Tyre Curing Process	Apollo Tyres	
13	Dr Arul Prakash	Reduced 1D model for measuring fractional flow reserve and in-vitro validation	Swansea University	
14	Dr Arul Prakash	Intranet-enabled software for the assessment of coronary heart disease	Swansea University	

### Retainer consultancy (ongoing and new)

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Dr Manivannan M.	Design and development of surgical robots	RoboSurg Pte Limited	6
2	Dr Sayan Gupta	Numerical studies on automotive steering systems	NSK Ranes	37.36

### Exchange programme with other universities, including institutions/universities under MoU

S. No	Student	Purpose	University/Institution
1	Vinothini S	DAAD Exchange programme	Technische Universität Braunschweig, Germany
2	Sreelakshmi S	DAAD Exchange programme	Technische Universität Braunschweig, Germany
3	Himanshu Kumar	DAAD Exchange programme	RWTH Aachen
4	Balachandran Raju	Joint Doctoral Programme	Swinburne University
5	Ramkishore Sankaralingam	Joint Doctoral Programme	Swinburne University
6	Vijaya Kumar	Joint Doctoral Program	RWTH Aachen

### Faculty members' participation with other institutions under MoU

S. No.	Faculty Member	Participation details	University
1	Dr Satyanarayan Seshadri	INDEE+ project on development of natural refrigerant based systems	NTNU Norway
2	Dr Arul Prakash	Strategic partnership programme	RWTH Aachen University, Germany

## 4.3 Department of Biotechnology

### 4.3.1. Introduction

The Department of Biotechnology at IIT Madras was founded in 2004 with a vision to be recognised as a department of international repute with a strong interdisciplinary research and teaching base in biological sciences and engineering involving an active collaboration with industries and health care institutions. The department is housed in the Bhupat and Jyoti Mehta School of Biosciences. The first batch of B.Tech. and dual degree students in Biotechnology graduated in July 2006 and 2007, respectively. The department's thrust areas of research are bioprocess engineering, computational biology, chemical biology and medical biotechnology related to cancer and cardiovascular aspects. Faculty members of the department hold several patents and are involved in active industrial con-

sultancy. Several collaborative and technology transfer projects are currently running with many industries and the department has collaborative research projects with hospitals. The department has set up a Centre of Excellence in Bioprocess Engineering to develop knowledge and expertise in this domain and a DST-funded national facility to identify potential drug targets through cellular dynamics and a FIST facility for infrastructure facilities. The DBT funded for a programme support on cancer biology earlier and now, DST is supporting a National Cancer Tissue Biobank. A Bioinformatics Centre has also been set up with DBT funding. IITM Bio-incubator initiated by the department (funded by BIRAC) offers lab and office space, including equipment, technical support and centralised utilities for process and product development.

### 4.3.2. Academic Programmes

A Dual Degree B. Tech and M. Tech in Biological Engineering (five years), Dual Degree B.S. and M.S. in Biological Sciences (five years), M.S. (by research) and Ph.D. are the academic programmes offered currently by the department. In addition, the department offers M.Tech (Clinical Engineering) and Ph.D. (Major: Biomedical Devices and Technology) programmes, jointly with Sree Chitra Tirunal Institute of Medical Sciences and Technology, Trivandrum and Christian Medical College, Vellore.

S.No.	Course No.	Title
1	BT5460	Biotechnology for Biofuels

### New labs established

Dr Shantanu Pradhan - BT Block 2 Room 204

Dr Nirav Pravinbhai Bhatt - BT Block 2 Room 303

### Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
Dual Degree		73		61	194	328
M.Tech.		24		20	1	45
M.S.		2	3	3	4	12
Ph.D.	5	11	16	18	146	196
Total	5	110	19	102	345	581

**Student/Scholar who attended conference/seminar/symposia abroad/India**

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposia/Workshop	Date and Venue	Financial Assistance from
Abroad					
1	Priyanshu Sharma	BT16D006	AACR Virtual Annual Meeting I and II	27-28 April and 22-24 June 2020	
2	Poonam Yadav	BT15D044	AACR Virtual Annual Meeting I and II	27-28 April and 22-24 June 2020	
3	Divagar M	BT17D302	All-virtual Imaging and Applied Optics Congress and Optical Sensors and Sensing Congress	22-26 June 2020 (virtual)	
4	Herald Wilson Ambrose	BT15D016	The 6th International Conference on Water Resource and Environment (WRE 2020)	23-26 August 2020 (virtual)	IIT
5	Purnima K V K	BT17D022	EMBL Conference: Molecular Mechanisms in Evolution and Ecology	30 September-2 October 2020 (virtual)	Centre for Integrative Biology and Systems Medicine (IBSE), IIT Madras
6	Viswa Chaitanya	BT16D023	EMBL Conference: Molecular Mechanisms in Evolution and Ecology	30 September-2 October 2020 (virtual)	IBSE
7	Azra Aziz	BT17D025	Bernstein Conference 2020	1 October 2020 (virtual)	
8	Bhadra S Kumar	BT15D052	Bernstein Conference 2020	1 October 2020 (virtual)	
9	Sandeep Nair	BT18D007	NeuroMatch 2020	26-30 October 2020 (virtual)	
10	Sarayu M	BT16D001	4th International Conference on Plant Synthetic Biology, Bioengineering and Biotechnology (Plant-SynBio 2020)	30 October-1 November 2020 (virtual)	
11	Herald Wilson Ambros E	BT15D016	2020 Virtual AiCHE Annual Meeting	16-20 November 2020 (virtual)	
12	Mareeswari P	BT15D305	World Biomaterial Congress	December 2020 (virtual)	
13	Vasudha T K	BT18D203	World Biomaterials Congress 2020	December 2020 (virtual)	IIT
14	Sandeep Nair	BT18D007	Society for Neuroscience (SfN 2020)	11-13 January 2021 (virtual)	
15	Sonal Omer	BT17D029	E-symposia - Sleep and Circadian Rhythms: Pillars of Health	25 February 2021 (virtual)	Keystone Symposia
16	Lavanya Raajaram M	BT17D401	7th Conference on Constraint-Based Reconstruction and Analysis (COBRA 2021)	1-2 March 2021 (virtual)	
17	Aswathy S	BT17D003	7th Conference on Constraint-Based Reconstruction and Analysis (COBRA 2021)	1-2 March 2021 (virtual)	

### Students/scholars who won outside prizes and awards

S. No.	Student/Scholar	Roll No.	Prize	Prize awarded by
1	Divagar M	BT17D302	SITARE-GYTI 2020	BIRAC and SRISTI
2	Priyanshu Sharma	BT16D006	2020 AACR Global Scholar-In-Training Award (GSITA)	AACR (American Association for Cancer Research)
3	Herald Wilson Ambrose	BT15D016	Best Video Presentation	WRE
4	Sarayu M	BT16D001	Women Leading IITM grant for 2021-22	WLI, IIT Madras

### 4.3.3. Faculty and Their Specialisation

#### Faculty

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Dr Guhan Jayaraman ( <b>Head</b> )	Metabolic engineering, synthetic biology, downstream processing
Dr D. Karunakaran	Cancer biology, signal transduction, apoptosis
Dr Anju Chadha	Biocatalysis, green chemistry, biosensors
Dr G.K. Suraishkumar	Understanding and manipulation of biological systems, reactive species and their applications-cancer therapy, nanotoxicology, bio-energy
Dr S. Mahalingam	Molecular virology and cell biology
Dr Rama Shanker Verma	Stem cell biology and tissue regeneration, cancer therapeutics
Dr V. Srinivasa Chakravarthy	Computational neuroscience
Dr N. Satyanarayana Gummadi	Bioprocess engineering
Dr K. Subramaniam	Developmental biology
Dr Amal Kanti Bera	Ion channels and signaling
Dr Sanjib Senapati	Computational biophysics
Dr Nitish R. Mahapatra	Cardiovascular genetics, molecular medicine
Dr A. Gopala Krishna	Signal transduction and protein biochemistry
Dr M. Michael Gromiha	Bioinformatics, computational biology, biophysics
Dr K. Chandraraj	Biomass conversion, bio-remediation, functional foods
Dr Rayala Suresh Kumar	Cancer biology
Dr V. Kesavan	Chemical biology
Dr R. Baskar	Developmental genetics
Dr Madhulika Dixit	Vascular biology
<b>Associate Professors</b>	
Dr N. Manoj	Structural biology
Dr Himanshu Sinha	Systems genetics, clinical data analysis
Dr Karthik Raman	Computational systems biology
Dr Vignesh Muthuvijayan	Biomaterials and tissue engineering
Dr Smita Srivastava	Plant biotechnology and bioprocess engineering

Dr Athi Narayanan	Experimental/computational protein folding
<b>Assistant Professors</b>	
Dr R. Murugan	Theoretical biology and biophysics
Dr Hamsapriya Mohanasundaram	Biomolecular simulations, computational biophysics, protein self-assembly and aggregation, design of therapeutics
Dr Vani Janakiraman	Infection biology/infectious diseases
Dr Nirav Pravinbhai Bhatt	Modeling, control, and optimisation of biochemical reaction systems, systems biology, integrated bio- process manufacturing
Dr Shantanu Pradhan	Biomaterials, tissue engineering, cancer and vascular diseases
Dr Ninitha A. J.	Cardiovascular biology, metabolic syndrome, neurophysiology
Dr Nathiya Muthalagu	Cancer biology, mouse models of cancer
<b>Emeritus Scientist/Professor</b>	
Dr Mukesh Doble	Biomaterials, drug design, biochemical engineering
Dr Chandra T. S.	Microbiology and genetics

### Short-term courses/workshops/seminars/symposia/conferences organised by faculty members

S. No.	Coordinator(s)	Title	Period
<b>Symposium</b>			
1	Dr Karthik Raman, Dr Himanshu Sinha	India-EMBO International Symposium on Engineering Meets Evolution: Designing Biological Systems	30 January-1 February 2020
<b>Workshop</b>			
1	Dr Karthik Raman	NPTEL Lab Workshop on Computational Systems Biology (Virtual)	24-27 August 2020
<b>Short-term Course</b>			
1	Dr Shantanu Pradhan, Dr Vignesh Muthuvijayan	Advances in Biomaterials and Tissue Engineering	25-31 January 2021

### Short-term courses/workshops/seminars/symposia/conferences/training attended by faculty members in academic institutions and public sector undertakings

S. No.	Faculty Member	Title	Institution	Period
<b>Workshops</b>				
1	Dr G. K. Suraishkumar	Leadership for Academicians Program (LEAP) - 2020	Ministry of Education - organised by IIT Bombay	25 February-8 March 2020
2	Dr Shantanu Pradhan	University of Sydney and IIT Madras Joint Workshop on Translational Health Science	University of Sydney and IIT Madras	15-16 March 2021
<b>Symposia</b>				
1	Dr Karthik Raman	Computational Modeling in Biology Network (COMBINE) (2020)	Online virtual meeting	9-13 October 2020
2	Dr Karthik Raman	Harmony 2020	EMBL-EBI, Cambridgeshire, UK	9-13 March 2020



3	Dr M. Michael Gromiha	International Symposium on Life Science and Technology	Tokyo Institute of Technology	18 February 2021
4	Dr Karthik Raman	Harmony 2021	Online virtual meeting	22-26 March 2021

**Conferences**

1	Dr Karthik Raman	6th Annual Metagenomics and Metadesign of Subways and Urban Biomes (MetaSUB) Conference (virtual)	USA, virtually attended	13 August 2020
2	Dr Nirav Pravinbhai Bhatt	2020 American Control Conference	Denver, CO, USA, virtually attended	1-3 July 2020
3	Dr Rama Shanker Verma	A Novel Biomimetic Non- suturable Patch for Stem Cell Delivery for Cardiac Regeneration, International Conference on Biomedical Materials Innovation (30th SBAOI Annual Meeting and 12th STERMI Annual Meeting)	Bharathiar University, Tamil Nadu, India	6-9 December 2020
4	Dr Rama Shanker Verma	Development of self-healing interpenetrating hydrogel-based 3D printed scaffolds for meniscus regeneration, International Conference on Biomedical Materials Innovation 2020 (30th SBAOI Annual Meeting and 12th STERMI Annual Meeting)	Bharathiar University, Tamil Nadu, India	6-9 December 2020
5	Dr Rama Shanker Verma	A novel biomimetic non- suturable adhesive-patch based delivery system for internal tissue, International Conference on Biomedical Materials Innovation 2020, 30th SBAOI Annual Meeting and 12th STERMI Annual Meeting	Bharathiar University, Coimbatore, India	6-9 December 2020
6	Dr Nirav Pravinbhai Bhatt	CODS COMAD 2021, 8th ACM IKDD CODs and 26th COMAD	Bangalore, India, virtually attended	2-4 January 2021
7	Dr Rama Shanker Verma	Injectable hydrogel for co- delivery of 5- azacytidine in protein nanoparticles with stem cells for cardiac function restoration, International Conference on Nanoscience and Nanotechnology 2021	SRM Institute of Science and Technology, Tamil Nadu, India	1-3 February 2021
8	Dr Nitish R. Mahapatra	Heart Failure Conflux 2021	Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram (Online)	5-7 February 2021
9	Dr Rama Shanker Verma	Cardiac function restoration by co- delivery of 5- azacytidine in protein nanoparticles for effective stem cell differentiation in rat myocardial infarction, 19th International e- Symposium on Advances in Technology and Business Potential of New Drug Delivery Systems	Controlled Release Society, Indian Chapter	25-27 February 2021
10	Dr Nitish R. Mahapatra	International Conference on Genome Biology	Madurai Kamraj University (Online)	28 February-2 March 2021
11	Dr Shantanu Pradhan	13th Young Investigators Meeting 2021	India Bioscience	17-19 March 2021

**Special lectures delivered by faculty in other institutions**

S. No.	Faculty Member	Topic of Lecture	Institution	Date
1	Dr Rama Shanker Verma	International conference Indo- US Conference on Bioengineering and Regenerative Medicine (ICBR- 2020)	Bioscience and Bioengineering, Indian Institute of Technology BHU Varanasi	26-29 February 2020
2	Dr Rama Shanker Verma	Vaccine against COVID-19: any possibilities	Department of Botany, Mizoram University	18 May 2020
3	Dr M. Michael Gromiha	Protein sequence and structure analysis	Kalasalingam University, Tamil Nadu	8 June 2020
4	Dr Rama Shanker Verma	"Stem cell culture and tissue engineering" – virtual course on Research Methodology	K.S. Rangasamy School of Engineering, Erode, Tamil Nadu	12 June 2020
5	Dr M. Michael Gromiha	Binding affinity of protein- protein complexes	SSN College of Engineering	24 June 2020
6	Vignesh Muthujayan	Material interactions with biological systems	Saint-Gobain Research India Private Limited	13 August 2020
7	Dr Nitish R. Mahapatra	Battling hypertension in COVID-19 era	Shyama Prasad Mukherjee University, Ranchi (online)	22 August 2020
8	Dr Amal Kanti Bera	Trans fat: a silent killer	Calcutta University	1 September 2020
9	Dr Amal Kanti Bera	LRR8 channel in neuron-glia signaling	NIPER, Ahmedabad	11 September 2020
10	Dr Karthik Raman	"Computational Approaches to Understand Biological Networks" at The Centre for Predictive Human Model Systems (CPHMS), Atal Incubation Centre – Centre for Cellular and Molecular Biology (AIC - CCMB) (Virtual)	Centre for Cellular and Molecular Biology, Hyderabad	26 September 2020
11	Dr Amal Kanti Bera	Role of LRR8 proteins in Neuro-Glia signaling	Indian Academy of Neuroscience	5 October 2020
12	Dr M. Michael Gromiha	1. Introduction to Bioinformatics and Databases 2. Protein sequence analysis 3. Protein secondary structure 4. Protein tertiary structure	NIT Arunachal Pradesh	5-8 October 2020
13	Dr M. Michael Gromiha	Databases in bioinformatics	Bharath University	9 October 2020
14	Dr M. Michael Gromiha	Systematic approaches for developing tools in computational biology	VIT	27 October 2020
15	Dr Karthik Raman	Learning On, Using and From Networks in Biology, 1st Joint 4EU+/HGS MathComp Annual Colloquium (virtual)	Heidelberg Graduate School of Mathematical and Computational Methods in the Sciences	2 December 2020

16	Dr G. K. Suraish-kumar	Pollutants of Emerging Concern: Sustainability with Reactive Species	Bharathidasan University - online lecture	4 December 2020
17	Dr Nirav Pravin-bhai Bhatt	AI for Pharma	Pfizer India, Chennai	6 December 2020
18	Dr M. Michael Gromiha	Role of computational techniques in biological research	VIT	18 December 2020
19	Dr M. Michael Gromiha	Integrating computational approaches and experimental data to understand the binding affinity of protein- protein complexes	Tokyo Institute of Technology	18 February 2021
20	Dr M. Michael Gromiha	Data-driven approach for understanding protein structure and function	Bharathiar University	19 February 2021
21	Dr Karthik Raman	Unravelling microbial interactions in the gut microbiome through computational approaches, 7th BSSE Annual Research Symposium, Centre for BioSystems Science and Engineering (BSSE) (Virtual)	Indian Institute of Science (IISc), Bengaluru	20 February 2021
22	Dr Nitish R. Mahapatra	National Science Day Lecture on 'Genome science and future medicine'	Patha Bhavan High School, Kolkata (online)	28 February 2021
23	Dr Ninitha A J	Lecture on career development	Tanuvass, Chennai	4 March 2021
24	Dr M. Michael Gromiha	Computational approaches for understanding protein structure and function	Vel-Tech High Tech Engineering College	26 March 2021
25	Dr Amal Kanti Bera	Pannexin-P2X7 receptor-Calcium: a nexus for cell survival and death	Physiological Society of India	24 April 2021

### Awards obtained by faculty

S. No.	Faculty Member	Award	Awarded by	Awarded for	Date of Award
1	Dr Rama Shanker Verma	Poster award	Controlled Release Society, Indian Chapter	Cardiac function restoration by co-delivery of 5-azacytidine in protein nanoparticles for effective stem cell differentiation in rat myocardial infarction, 19th International e-Symposium on Advances in Technology and Business Potential of New Drug Delivery Systems	25-27 February 2021

### Fellow ships of academies and professional societies

S. No.	Faculty Member	Year of Admission
<b>Fellow of the Telangana Academy of Sciences</b>		
1	A. Gopala Krishna	2019
<b>Ramalingaswami Re-Entry Fellowship</b>		
1	Dr Nathiya Muthalagu	2020-21

### Journal Editorial Boards

S. No.	Faculty Member	Position	Journal Name
1	Dr M. Michael Gromiha	Associate Editor	<i>BMC Bioinformatics</i>
2	Dr M. Michael Gromiha	Associate Editor	<i>Frontiers in Bioinformatics</i>
3	Dr M. Michael Gromiha	Section Editor	<i>Current Protein and Peptide Science</i>
4	Dr M. Michael Gromiha	Editorial Board Member	<i>Scientific Reports</i>
5	Dr M. Michael Gromiha	Editorial Board Member	<i>Biology Direct</i>
6	Dr M. Michael Gromiha	Editorial Board Member	<i>Genes</i>
7	Dr M. Michael Gromiha	Editorial Board Member	<i>Journal of Bioinformatics and Computational Biology</i>
8	Dr M. Michael Gromiha	Editorial Board Member	<i>Current Computer Aided Drug Design</i>
9	Dr S. Mahalingam	Editorial Board Member Associate Editor	<i>Nature Scientific Reports</i> <i>Frontiers in Virology</i>
10	Dr Amal Kanti Bera	Reviewing Editor	<i>Frontiers in Physiology</i>
11	Dr Vignesh Muthuvijayan	Review Editor	<i>Frontiers in Bioengineering and Biotechnology</i>
12	Dr Karthik Raman	Editorial Board Member	<i>Scientific Reports</i>
13	Dr Karthik Raman	Editorial Advisory Board	<i>ACS Synthetic Biology</i>
14	Dr Karthik Raman	Review Editor	<i>Frontiers in Bioengineering and Biotechnology</i>

### 4.3.4. Design and Development Activities

#### New facilities added or major equipment procured

S. No.	Equipment	Value (Rs. in lakh)
1	Shimadzu HPLC LC20AR Semi-Preparative	35
2	Agilent GCMS 8890	45

### Patents

#### Patents filed

S. No.	Faculty Member	Topic of Patent
1	Dr Guhan Jayaraman	Process for production of high molecular weight hyaluronan in a recombinant <i>Lactococcus lactis</i> using acetate co-utilization fed-batch strategy; application no: PCT/IN2020/050447, filing date: 19 May 2020, PCT Application
2	Dr Mukesh Doble	Method for preparing calcium lactate nanostructures and its applications thereof; application no: 202041021218; filing date: 20 May 2020, Country: India
3	Dr Guhan Jayaraman	Method for direct quantification of nucleic acids in real time qPCR; Application No: US16/766,205, Filing date: 21 May 2020, Country: United States
4	Dr Madhulika Dixit	Miniaturized indigenous cone plate device for applying laminar shear to cultured mammalian cells; Application No: 202043024268, Filing date: 10 June 2020, Country: India

5	Dr Nirav Pravinbhai Bhatt	Continuous flow process and apparatus for manufacture of dl-2-nitro-1-butanol; Application No: PCT/IN2020/050683, Filing date: 1 August 2020, PCT Application
6	Dr Rama Shanker Verma	A biomimetic suture-less patch- based delivery system for internal soft tissues; Application No: 202041040844, Filing date: 21 September 2020, Country: India
7	Dr Srinivasa Chakravarthy V	Deep q-learning based computational model for visual attention search; Application No: 202041042419, Filing date: 29 September 2020, Country: India
8	Dr Chandraraj K	Method for production of molds from cotton microdust waste and its reinforcement with sand; Application No: 202041046525, Filing Date: 26 October 2020, Country: India
9	Dr Rama Shanker Verma	Nanozyme Linked Oligo Probe Sorbent Assay (NLOPSA) for the detection of nucleic acid biomarkers; Application No: PCT/IN2020/050970, Filing date: 19 November 2020, PCT Application
10	Dr Srinivasa Chakravarthy V	Multiscale systems neuropharmacological model of cortico-basal ganglia circuitry of reaching for normal and Parkinson's Disease Application No: 202043057227, Filing date: 30 December 2020, Country: India
11	Dr Srinivasa Chakravarthy V	Multiscale systems neuropharmacological model of cortico-basal ganglia circuitry of reaching for normal and Parkinson's Disease; Application No: PCT/IN2021/050020, Filing date: 7 January 2021, PCT Application

### Patents awarded

S.No.	Faculty Member	Topic of Patent
1	Dr Mukesh Doble	System and method for measuring permeability of drugs/toxic chemical compounds; UK Patent No. GB2541832; date 19 August 2020
2	Dr Mukesh Doble	Process of blending cyclic (A or $\beta$ ) glucan compound with synthetic or biopolymer for use as drug carrier; Patent granted, Indian Patent No. 348864, date: 8 October 2020
3	Dr Rama Shanker Verma	Synthesis of poly(tBGE-alt-PA) copolymer via metal-free approach; Patent No: 351891, Patent date: 23 November 2020, Country: India
4	Dr Mukesh Doble	Antibiofilm and antimicrobial polymer film and process of producing the same; Patent granted, Indian Patent No. 361728, date: 17 March 2021
5	Dr Karunagaran D	Method to report and demonstrate the transactivation of cyclic AMP-Induced gene expression; Patent No: 362101, Patent date: 19 March 2021, Country: India

### 4.3.5. Research and Consultancy

#### Sponsored research projects (ongoing and new)

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1	Inspire Faculty Award to Dr Ninitha Margret Julfiya A J	2018-2023	Department of Science & Technology	71.00	Dr Ninitha A J

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
2	Adapting the standard SIR model for COVID-19 and effects of climate and lockdowns on infectious spread of SARS-CoV-2	2020-2021	Science and Engineering Research Board	5.50	Dr M Michael Gromiha
3	Structure- function relationship of APJ receptor - binding mode of cognate ligand Apelin towards characterizing the ligand binding site, elucidation of signaling pathways and drug discovery	2020-2021	Indian Council of Medical Research	21.05	Dr A Gopala Krishna
4	Preterm birth risk in pregnant women and prediction using machine learning models	2020-2022	Biotechnology Industry Research Assistance Council	21.70	Dr Himanshu Sinha
5	Genome India: Cataloguing the genetic variation in Indians	2020-2023	Department of Biotechnology	140.00	Dr Himanshu Sinha
6	Identification of therapeutic targets for glioblastoma by single-cell RNA- seq analysis	2020-2023	Department of Health Research (ICMR)	42.53	Dr M Michael Gromiha
7	Shear stress effects on metastasizing cancer cells – toward better cancer therapies	2020-2023	Science and Engineering Research Board	52.48	Dr G K Suraishkumar
8	Lipid transfer mechanism of cholesteryl ester transfer protein: role of triglycerides	2020-2023	Department of Biotechnology	24.94	Dr Sanjib Senapati
9	Integrated approach for understanding the binding affinity of protein-nucleic acid complexes: development of database, tools and applications to diseases	2020-2023	Science and Engineering Research Board	38.47	Dr M Michael Gromiha
10	A study on pollen competition in Arabidopsis hybrids	2020-2023	Department of Science & Technology	46.43	Dr R Baskar
11	Structure-based drug design and mechanistic studies for COVID-19	2020-2023	Science and Engineering Research Board	10.05	Dr M Michael Gromiha
12	Mapping of NCOR1 and DLK1 interaction in the endometrial cancer: a regulation via notch signalling	2020-2023	Science and Engineering Research Board	10.05	Dr Rayala Suresh Kumar
13	Structure- function relationship of phosphate solubilizing glucose dehydrogenase from novel Pseudomonas SP	2020-2023	Science and Engineering Research Board	10.05	Dr A Gopala Krishna
14	Metabolic engineering approaches for hyaluronic acid production in lactococcus lactis	2020-2023	Science and Engineering Research Board	10.05	Dr Guhan Jayaraman
15	Understanding the functional dynamics and drug efflux mechanism of ABC transporters	2020-2023	Science and Engineering Research Board	10.05	Dr Athi Narayanan N
16	Exploring the potential role of poly (ADP-ribose) polymerase (PARP) 6 in the development of hypertension induced cardiomyopathy	2020-2023	Science and Engineering Research Board	50.07	Dr Ninitha A J

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
17	Can extended H- bonding network due to protic ionic liquids facilitate the growth and stability of discrete water domains in hydrophobic environment?	2020-2023	Science and Engineering Research Board	42.83	Dr Sanjib Senapati
18	INCENTIVE: Indo- European Consortium for Next-Generation Influenza Vaccine Innovation	2020-2025	Department of Biotechnology	265.24	Dr Himanshu Sinha
19	Three-dimensional tissue-engineered platform for investigation of obesity-induced inflammation, insulin resistance and breast cancer	2020-2025	Department of Biotechnology	42.50	Dr Shantanu Pradhan
20	Tissue- engineered model of endothelial plasticity and breast cancer progression	2021-2023	Science and Engineering Research Board	25.30	Dr Shantanu Pradhan
21	Studies on a novel nanotechnology-based stem cell therapy for the treatment of Alzheimer's Disease	2021-2024	Department of Health Research (ICMR)	41.37	Dr Rama Shanker Verma
22	Development of improved process for production of 3- hydroxypropionic acid from crude glycerol and lignocellulosic biomass derived glucose	2021-2024	Department of Biotechnology	33.93	Dr Guhan Jayaraman
23	Understanding microbial interactions in microbiomes through metabolic modelling	2021-2024	Science and Engineering Research Board	6.60	Dr Karthik Raman
24	Sequential motor skills: a dual system view	2021-2024	Indo-French Centre for the Promotion of Advanced Research	32.90	Dr Srinivasa Chakravarthy V
25	Decoding the genetic program that regulates stress-induced quiescence in C. elegans germline stem cells	2021-2026	Wellcome Trust	169.90	Dr K. Subramaniam

### Industrial consultancy projects (ongoing and new)

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Dr R Baskar	Semi-Preparative HPLC and GS-MS (Single Quad) Analysis	Common Code	5.00
2	Dr R Baskar	Semi-Preparative HPLC and GS-MS (Single Quad) Analysis	Common Code	5.00
3	Dr Smita Srivastava	Bioincubator Support Scheme, 6 March 2013	Common Code	36.90
4	Dr Smita Srivastava	Bioincubator Support Scheme, 6 March 2013	Common Code	14.06
5	Dr Srinivasa Chakravarthy V	Online career guidance for students	L&T Technology Services Limited	16.85



**RBIC projects (ongoing and new)**

S.No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Dr Guhan Jayaraman	Direct detection of SARS-COV2 RNA from saliva samples with rolling circle amplification (RCA) and bioluminescence resonance energy transfer (BRET)	Onu Technology Incorporation	3.00
2	Dr Guhan Jayaraman	Separation of beta lactoglobulin isoform (B-LGB) from mixture of LGB A and LGB B isoforms	Perfect Day India Private Limited	6.61

**4.3.6. Other Activities of the Department**

Inter-disciplinary group achievements of the department

Dr Nirav Pravinbhai Bhatt is a principal investigator on an interdisciplinary pCoE for Network Systems Learning, Control and Evolution.



## 4.4 Department of Chemical Engineering

### 4.4.1 Introduction

The Department of Chemical Engineering was established in 1959. It has a rich pool of permanent faculty members, who are not only dedicated teachers, but also researchers carrying out cutting-edge research in frontier areas of chemical engineering and inter/multi-disciplinary subjects. The focus of the research is on reaction and transport processes, energy, materials and environment. The faculty work towards analysing these systems at multiple scales by understanding their behaviour from the molecular to macroscopic levels as well as using a system-based approach.

### 4.4.2 Academic Programmes

#### New courses introduced

S. No.	Course No.	Title
1.	ID5500	Battery Technology

#### Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021

S. No.	Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
1.	B.Tech.	118	95	69	61	5	348
2.	Dual Degree	0	01	16	29	27	73
3.	M.Tech.	44	25	01	0	0	70
4.	M.S.	00	10	07	07	01	25
5.	Ph.D.	19	23	20	25	30	117
<b>Total</b>		<b>181</b>	<b>154</b>	<b>113</b>	<b>122</b>	<b>63</b>	<b>633</b>

#### Students/Scholars who attended conferences/seminars/symposia - online mode

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposia/Workshop	Date and Venue
1.	Dr Ramya Ramkumar	IPDF	International Webinar Series on Water Challenges During and Post COVID-19	7-28 May 2020
2.	Dr Sheen Mers S. V.	IPDF	Webinar: International Virtual Lecture Workshop on Bio-nano Interface for COVID-19, Thiagarajar College, Madurai	31 May 2020
3.	Dr Sheen Mers S. V.	IPDF	Webinar: Nanomaterials for Energy and High-Temperature Applications, organised by Chemistry Division, School of Advanced Sciences, VIT, Chennai	1-3 June 2020

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposia/Workshop	Date and Venue
4.	Dr Sheen Mers S. V.	IPDF	ACS virtual talk on Ultra-low Thermal Conductive Metal Chalcogenides for High-Performance Thermoelectric Energy Conversion, by Prof. Kanishka Biswas, JNCASR, Bangalore, IISER Pune	10 June 2020
5.	Dr Sheen Mers S. V.	IPDF	ACS virtual talk on Perovskite Semiconductor Nanocrystals: Lights, Electrons, Action, by Prof. Angshuman Nag, IISER Pune	12 June 2020
6.	Dr Sheen Mers S. V.	IPDF	Webinar on Rational Designing of Biosensors for Diagnostics organised by Chemistry Division, School of Advanced Sciences, VIT, Chennai	28-29 June 2020
7.	Dr Ramya Ramkumar	IPDF	Webinar on Clean Water: Emerging Frontiers	29 June-8 July 2020
8.	Dr Ramya Ramkumar	IPDF	Two-day National-level workshop on Electrical Energy Storage Systems (EESS)	20-21 August 2020
9.	S. Neeraja	CH15D209	Participated in the American Control Conference	1-3 July 2020
10.	K. V. S. Chaithanya	CH17D200	Title: Curvature-driven dynamics of a microswimmer, conference: e-Conference on Soft Matter (eCoSoM-2020)	15-17 July 2020
11.	Dr Gurram Venkata Ramesh Babu	IPDF	Industrial Catalysis organised by Catalysis Society of India (CSI) in association with ACS India International Chapter	3 October 2020
12.	Dr Ramya Ramkumar	IPDF	Powder Diffraction School by ANSTO (Australian Nuclear Science and Technology Organisation)	6-8 October 2020
13.	Pushkala V.	CH18D401	2020 Virtual AIChE Annual Meeting	16-20 November 2020
14.	C. D. Balaji	CH18D016	2020 Virtual AIChE Annual Meeting	16-20 November 2020
15.	K. V. S. Chaithanya	CH17D200	Title: A viscoelastic two-fluid model for the self-propulsion of Helicobacter pylori in a mucus layer, conference: APS - DFD	22-24 November 2020
16.	Sundara Bharathi D	CH19D300	28th International Conference (Virtual) of Forum for Interdisciplinary Mathematics (FIM) - Synergies in Computational, Mathematical, Statistical and Physical Sciences (FIM28:SCMPS 2020) organised by FIM, Stella Maris College and SSN College, TN	23-27 November 2020
17.	K. Sriram	CH17D012	Soft Matter Young Investigators Meet - 2020 Poster Presentation	3 December 2020
18.	Rumiay Pervin	CH14D010	Soft Matter Young Investigators Meet - 2020 Poster Presentation	3 December 2020
19.	Dr Pavan Kumar, Institute Post Doc	IPDF	Complex Fluids (CompFlu-2020), IIT Bombay, presented a poster titled, Morphology of a compound particle in a quadratic flow (virtual) (Pavan Kumar Singeetham, Chaithanya K. V. S., Sumesh P. Thampi)	10-12 December 2020

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposia/Workshop	Date and Venue
20.	M. Prajitha	CH17D018	CompFlu (Complex Fluid) 2020 (virtual conference): poster presentation with a flash talk organised by IIT Bombay and Indian Society of Rheology (ISR); poster title: Dynamics of microswimmers at a fluid-fluid interface mediated by self-induced Marangoni flow	10-12 December 2020
21.	K. V. S. Chaithanya	CH17D200	Dynamics and stability of a viscoelastic active compound particle, conference: Complex Fluids	10-12 December 2020
22.	P. Saveri	CH19S011	Complex Fluids 2020 by Indian Society of Rheology	10-12 December 2020
23.	Dr Pavan Kumar, Institute Post Doc	IPDF	International Congress on Rheology (ICR-2020), Brazil, presented paper, Rheology of a dilute dispersion of compound particles, virtually (Pavan Kumar Singeetham, Chaithanya K. V. S., Sumesh P. Thampi)	13-18 December 2020
24.	M. Prajitha	CH17D018	ICSM (International Conference on Soft Materials) 2020 (virtual conference): poster presentation with a flash talk, organised by MNIT, Jaipur, India; poster title: Dynamics of microswimmers laden fluid-fluid interface mediated by self-induced Marangoni flow	13-18 December 2020
25.	K. V. S. Chaithanya	CH17D200	Deformation dynamics of an active compound particle in a shear flow, conference: 4th International Conference on Soft Materials (ICSM2020)	13-18 December 2020
26.	Hemant Kumar	CH17D004	International Congress on Rheology, ICR2020; talk topic: Phase inversion of Pickering emulsion of hematite ellipsoidal particles by surface modification by oleic acid	13-18 December 2020
27.	Bhadra Hrishikesh	CH16D403	ICSM (International Conference on Soft Materials) 2020 (virtual conference): poster presentation with a flash talk, organised by MNIT, Jaipur, India; poster title: Collective dynamics of rotating active particles with attraction	13-18 December 2020
28.	Diksha Rajendra Khakal	CH18S006	18th International Congress on Rheology, ICR2020 on topic, Rheological characterisation of oppositely charged gels	14-17 December 2020
29.	Dr Shiny P.J., Project Post Doc	NPDF	National Webinar on Patenting of Biotechnological Inventions in India, Guru Nanak College, Chennai	29 January 2021
30.	Praphulla	CH18D002	The International Flow Battery Forum Online Conference, presented the poster on 'Performance evaluation of single cell VFB at low temperatures'	19-21 January 2021
31.	M. Prajitha	CH17D018	ANZIAM (Australian and New Zealand Industrial and Applied Mathematics) 2021 (Virtual Conference); talk title: Dynamics of microswimmers at the liquid-gas interface mediated by self-induced Marangoni flow	31 January-5 February 2021

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposia/Workshop	Date and Venue
32.	Hariharan B	CH19S005	CHISA 2021 Virtually - International Congress of Chemical and Process Engineering; paper title: Identification of globally optimal mixture-process variables in multi-objective optimisation of multicomponent adsorption	16 March 2021
33.	Md. Malik Nawaz Khan	CH16D015	CAMURE 11 (11th International Symposium on Catalysis in Multiphase Reactors) - ISMR 10 (10th International Symposium on Multifunctional Reactors) - AIDIC	21-24 March 2021
34.	Saif Ul Mehdi	CH16D200	24th International Congress on Chemical and Process Engineering held at Prague, Czech Republic and presented paper, Synthesis of leach resistant and pH tolerant metal organic frameworks for adsorption of heavy metal ions	15-18 March 2021
35.	Uttam Kumar	CH18D010	American Physical Society DFD-73 virtual meeting session, Biological Fluid Dynamics: Single Cells and Bacteria - presented paper, Modeling of bacterial chemotaxis in porous media	22-24 November 2020
36.	Hariharan B	CH19S005	CHISA 2021 Virtually - International Congress of Chemical and Process Engineering, presented paper, Identification of globally optimal mixture-process variables in multi-objective optimisation of multicomponent adsorption	16 March 2021

### Students/Scholars who won Institute Convocation/Institute Day Prize

S. No.	Student/Scholar	Roll No.	Prizes	Donor
1.	Gangal Chinmay Shripad	CH16B009	Reliance Heat Transfer Private Limited Prize with the best academic record to the B.Tech student in Chemical Engineering	Reliance
2.	Sajay V	CH16B061	Subramaniam Rajalakshmi Indira Endowment Prize to the B.Tech student with the best interdisciplinary project	Smt. Subramaniam Rajalakshmi Indira
3.	Aswin Chandrasekar	CH15B016	B Ravichandran Memorial Prize with the best academic record to the Dual Degree (B.Tech and M.Tech) student in Chemical Engineering	Shri B Ravichandran
4.	Jishnusankar KS	CH18M012	Dr K Subba Raju Memorial Prize to the M.Tech student with the best academic record in Chemical Engineering	Dr K Subba Raju
5.	Abhishek Sharma	CA18M004	Shri S V Balakrishnan Prize to the M.Tech student with the best academic record in Catalysis Technology in Chemical Engineering	Shri S V Balakrishnan Prize

6.	Maddineni Srinivasaraq	CH18M028	Prof M Ramanujam Memorial Award to the student of Dual Degree/M.Tech student, who has done project in the area of Particle Technology and secured the highest CGPA at the end of pre-final semester	Prof M Ramanujam
7.	Danam Mahesh	CH17S006	Smt. D L Saraswati Memorial Prize to the M.Tech/Dual Degree student or M.S. Scholar with best project in the area of Environmental Engineering.	Smt. D L Saraswati
8.	Ramya KA	CH14D408	Institute Research Award in recognition of the exemplary research work done by the scholar during the period of her research	IITM
9.	Anoop Pushkar	CH18D200	Dr V Mahadeva Iyer Prize For academic performance in the first two semesters of M. Tech as part of the Institute Day Prizes	Dr V Mahadeva Iyer
10.	Leo Lukose	CH15D404	Keshav Ranganath Award 2019-20 (January-May)	IITM
11.	Aswathy K Raghu	CH15D400	Institute Research Award in recognition of the exemplary research work done by the scholar during the period of her research (July-November 2019-20)	IITM

#### 4.4.3. Faculty and Their Specialisations

##### Faculty

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Dr Nagarajan R (Head)	Ultrasonic and megasonic fields, cleanroom and contamination control, nano-particle synthesis and nano-composite formulation
Dr Abhijit P Deshpande	Rheology of complex fluids, polymers and polymeric composites, processing flow visualization
Dr Arun K Tangirala	Process systems engineering, control, identification and monitoring, applied signal processing
Dr Kannan A	Mathematical modeling, simulation and optimisation of chemical processes
Dr Niket S Kaisare	Catalytic combustion, micro-reactors, advanced process control, energy and fuel processing
Dr Preeti Aghalayam	Underground coal gasification, reduction of automotive NO <sub>x</sub> , reduction of large reaction mechanisms, reactor modeling
Dr Pushpavanam S	Modeling and simulation, non-linear dynamics, flow visualization
Dr Raghunathan Rengasamy	Process systems engineering, fuel cells, computational discrete microfluidics
Dr Raghuram Chetty	Electrocatalysis, fuel cells, wastewater treatment, CO <sub>2</sub> reduction
Dr Rajagopalan Srinivasan	Safety, sustainability and resilience of complex systems, cognitive engineering, supply chain management and enterprise optimisation
Dr Ramanathan S	Electrochemistry, chemical mechanical planarisation for semiconductor processing
Dr Ravi R	Applied statistical mechanics, foundations of thermodynamics and mechanics, process dynamics and control

Name and Qualifications	Major Areas of Specialisation
Dr Ravikrishna R	Contaminated sediment remediation, contaminant fate and transport, air pollution process and control
Dr Shankar Narasimhan	Process design, data mining, fault diagnosis
Dr Sreenivas Jayanti	Fuel cells, combustion, energy systems
Dr Sridharakumar Narasimhan	Process system engineering, optimization, process control, fault diagnosis
Dr Susy Varughese	Physics and mechanics of polymeric materials, polymeric nano composites
Dr Tanmay Basak	Microware application, mathematical modeling and simulation
Dr Upendra Natarajan	Polymer science and engineering, molecular simulation, statistical thermodynamics of complex fluids, nanostructured hybrid composite materials
<b>Associate Professors</b>	
Dr Basavaraja M Gurappa	Directed assembly of colloids, microstructure and rheology of colloids, surfactants, polymer and their mixtures, interfacial rheology, ionic liquids, particulate gels
Dr Ethayaraja Mani	Molecular simulations, self-assembly, mathematical modeling
Dr Rajnish Kumar	Gas hydrates (formation, inhibition and recovery), carbon dioxide capture, storage and utilisation methane and hydrogen storage hydrothermal liquefaction at sub-critical and supercritical conditions
Dr Renganathan T	Multiphase systems, gasification, capture of CO <sub>2</sub>
Dr Sumesh P Thampi	Hydrodynamics of complex fluids, interfacial flows, active matter
Dr Vinu R	Thermo-catalytic conversion of biomass to useful intermediates, photocatalysis for environmental decontamination, microkinetic modeling of complex reactions
<b>Assistant Professors</b>	
Dr Aravind Kumar Chandiran	Solar cells, solar water splitting, carbon dioxide reduction, photoconductivity, oxide semiconductors and solar energy research
Dr Himanshu Goyal	Clean energy (biofuels and carbon dioxide capture), process intensification, multiphase reactors, multiscale modeling, computational fluid dynamics (CFD), uncertainty quantification (UQ), high performance computing (HPC)
Dr Jithin John Varghese	Atomistic and computational modelling of catalytic reactions: catalytic conversion of light alkanes, biomass derivatives and carbon dioxide to fuels and chemicals
Dr Ramnarayanan R	Applying physical chemistry concepts to biology, light and state of matter interaction, solid state materials
Dr Tarak Patra	High throughput materials design, soft and nano materials, molecular simulations and machine learning, HPC and AI
<b>Professor Emeritus</b>	
Dr M.S. Ananth	Molecular thermodynamics and mathematical modelling
<b>INSPIRE Fellow</b>	
Dr Swagatika Sahoo	System biology, constraint-based metabolic modeling, human metabolism, metabolic disorders, inherited metabolic disorders

**Short-term courses/workshops/seminars/symposia/conferences organised by faculty members**

S. No.	Coordinator(s)	Title	Period
<b>Conference</b>			
1.	ChE IITM Faculty	Virtual Reception Session at the AIChE Annual Meeting	15 November 2020
<b>Workshops</b>			
2.	Dr Rajagopalan Srinivasan	Inauguration and Inaugural Symposium of American Express Lab for Data Analytics, Risk, and Technology (DART)	3 September 2021
3.	Dr Rajagopalan Srinivasan	3RD RBCDSAI industry conclave in collaboration with DART lab on financial analytics	31 March 2021

**Short-term courses/workshops/seminars/symposia/conferences/trainings attended by faculty members in academic institutions and public sector undertakings**

S. No.	Faculty Member	Title	Institution	Period
<b>Webinar/Workshop/Conference</b>				
4	Dr R. Vinu	Participated and given talk about Valorization of lignin to chemicals using thermochemical and catalytic platforms	King Abdullah University of Science and Technology, Saudi Arabia (webinar)	21 September 2020
5	Prof. R. Nagarajan. Paper co-authored with Dr Vetrimurugan	Chaired a session on Surface Cleaning and Cleanliness Measurement at ESTECH-EDUCON 2020, and presented paper, Spore log reduction using ultrasonic and megasonic frequencies		5-8 October 2020
6.	Prof. R. Nagarajan. Paper co-authored with Shri Apparao	Presented paper, Variable rate-controlled irrigation, at the Indo-Canadian Workshop on Precision Agriculture		30 October 2020
7	Prof. Rajagopalan Srinivasan	Paper presentation: R. Ranjan, N. Kaisare and R. Srinivasan, A testbed for studying the interactions between model predictive control (MPC) and human operators, 2020, Paper #342d	Virtual AIChE Annual Meeting	16-20 November 2020
8	Prof. Rajagopalan Srinivasan	Paper presentation: V. Pakkiriswamy and R. Srinivasan, An explainable artificial intelligence based approach for interpretation of fault detection results from deep neural networks, 2020 Virtual AIChE Annual Meeting, 16-20 November 2020, paper #375g	Virtual AIChE Annual Meeting	16-20 November 2020



S. No.	Faculty Member	Title	Institution	Period
9	Prof. Rajagopalan Srinivasan	Paper presentation: M. Choudhary, Md. U. Iqbal, B. Srinivasan and R. Srinivasan, Emerging cognitive engineering approaches to enhance control room operator capabilities in chemical industries, 2020 Virtual AIChE Annual Meeting, 16-20 November 2020, paper #537g	Virtual AIChE Annual Meeting	16-20 November 2020
10	Prof. Rajagopalan Srinivasan	Paper presentation: M. Shahrukh, R. Srinivasan and I. A. Karimi, Optimal procurement of LNG under uncertainty from a mix of long-term contracts and spot cargoes: comparison of a MILP and heuristic methodologies, 2020 Virtual AIChE Annual Meeting, 16-20 November 2020, paper #604c	Virtual AIChE Annual Meeting	16-20 November 2020
13	Prof. Rajagopalan Srinivasan	Session chair: Process Monitoring and Safety	9th Asian Symposium on Process Systems Engineering (9th PSE Asia 2020) Virtual	4-6 November 2020
14	Prof. Rajagopalan Srinivasan	Participated and presented paper, Ammonia Safety, in workshop on India's Green Ammonia Opportunity		9-11 November 2020

### Meetings attended by the faculty in other institutions

S. No.	Faculty Member	Purpose	Institution	Date
1.	Dr R. Nagarajan	Annual General Body Meeting and Board of Directors Meeting (online) of Coromandel International Limited	Coromandel International Limited	15 August 2020
2.	Dr R. Nagarajan	Board of Directors Meeting (online) of IIT Madras Canada Foundation	IIT Madras Canada Foundation	15 August 2020
3.	Dr R. Nagarajan	Served on Expert Committee to Review the Reports of the Boards of Studies	MVJ College of Engineering, Bengaluru.	28 August 2020
4.	Dr R. Nagarajan	Board of Trustees Meeting of IITM Alumni Charitable Trust (online)	IITM Alumni Charitable Trust	19 September 2020
5.	Dr R. Nagarajan	Board of Directors Meeting (online)	Coromandel International Limited	26 October 2020
6.	Dr R. Nagarajan	Board of Directors Meeting (online)	Coromandel International Limited	2 November 2020
7.	Dr R. Nagarajan	Board of Directors Meeting (online)	Coromandel International Limited	1 February 2021



**Special lectures delivered by the faculty in other institutions**

S. No.	Faculty Member	Topic of Lecture	Institution	Date
1.	Dr R. Vinu	Comparison of different analytical pyrolysis reactors for biomass conversion application, PyroAsia Forum & Frontier Lab Webinar Series		13 August 2020
2.	Prof. Rajagopalan Srinivasan	Delivered online webinar on Artificial intelligence in Oil Refinery Operation conducted for Indian Oil Management Academy	Indian Oil Management Academy	9 September 2020
3.	Prof. Rajagopalan Srinivasan	Delivered online webinar on Advanced Analytics in Oil and Gas	SAP User Group for the Indian Subcontinent (INDUS) SIG for Oil and Gas	8 May 2020
4.	Dr R. Vinu	Novel waste to energy and fuel technologies for efficient solid waste management in the Indian context, AQMCS Webinar 1 - Stubble Burning and its Alternative Use as Fuel, CONEXSYM Global	AQMCS Webinar 1	12 September 2020
5.	Dr R. Vinu	Valorization of lignin via different thermochemical and catalytic strategies to chemicals, online short-term course on "Valorization of lignocellulosic biomass towards sustainable fuels, chemicals and materials," NIT Jalandhar	NIT Jalandhar	19 September 2020
6.	Dr R. Vinu	Valorization of lignin to chemicals using thermochemical and catalytic platforms, SHASTRI Golden Jubilee Conference and Lecture Series, Indo-Canada, Bilateral Virtual Conference on Waste to Wealth, SASTRA University	SASTRA University	21 September 2020
7.	Dr R. Vinu	Valorization of lignin to chemicals using thermochemical and catalytic platforms, Webinar to King Abdullah University of Science and Technology, Saudi Arabia	King Abdullah University of Science and Technology, Saudi Arabia	21 September 2020
8.	Dr R. Vinu	Waste-to-energy technologies for efficient solid waste management in the Indian context, EU-India Research Perspectives on Plastic Waste, a virtual seminar co-hosted by the Delegation of the European Union to India and the Embassy of the Federal Republic of Germany in New Delhi	Co-hosted by the delegation of the European Union to India and the Embassy of the Federal Republic of Germany in New Delhi	22 October 2020

S. No.	Faculty Member	Topic of Lecture	Institution	Date
9.	Dr R. Vinu	Waste-to-energy and fuels via thermochemical technologies for efficient solid waste management in the Indian context, webinar on Thermo-Chemical Energy Conversion: Future Research Direction, VIT Chennai	VIT Chennai	4 December 2020
10.	Dr R. Vinu	Resource recovery from wastes via thermochemical XTL Technologies, Virtual EU Day on Circular Economy and Resource Efficiency		17 December 2020
11.	Dr R. Vinu	Thermochemical conversion of biomass and wastes to fuels and energy in the Indian context, International Virtual Workshop on Biofuel Production and Processing, Madanjeet School of Green Energy Technologies, Pondicherry University	Pondicherry University	24 February 2021
12.	Dr R. Vinu	Waste to energy and fuels using microwave assisted heating techniques, online lecture to Tata Steel R&D, Jamshedpur	Tata Steel R&D, Jamshedpur	11 March 2021
13.	Dr R. Vinu	Thermochemical technologies for efficient solid waste management in the Indian context, International Conference on Recent Technologies and Advanced Materials for Green Energy and Sustainable Environment, NIT Trichy	NIT Trichy	13 March 2021
14.	Dr R. Vinu	Hydrothermal co-liquefaction of cellulose with polypropylene, and municipal solid waste for the production of high-quality bio-crude, International Conference on Biotechnology for Sustainable Agriculture, Environment & Health (BSAEH-2021)	BSAEH-2021, Jaipur	5 April 2021
15.	Dr R. Vinu	Changing landscape of skills requirement for engineering graduates in process industries, panel discussion on Skills Development in Refining Industry and Renewable Energy Industry, organised by Chennai Petroleum Corporation Limited as a part of celebrating 75 years of India's Independence (Azadi Ka Amrit Mahotsav), Crowne Plaza, Chennai	CPCL, Chennai	9 April 2021

**Awards obtained by the faculty**

S. No.	Faculty Member	Award	Awarded by	Awarded for	Date of Award
1.	Dr Rajnish Kumar	Dr YBG Varma Award for Teaching Excellence in Chemical Engineering for the year 2020	IIT Madras	Teaching	
2.	Dr R. Vinu	Young Scientist Award, Dr M. Anandakrishnan Prize	The Academy of Sciences, Chennai	Engineering and Technology	24 March 2021
3.	Dr Aravind Kumar Chandiran	Technology Translation Award	DST-SERB	Development of white light emitters	30 March 2021
4.	J. Nallasivam, Francis Prashanth, S. Harisankar, Dr R. Vinu, Dr S.R. Chakravarthy	Third prize: Title of the idea: Biocrude production from the hydrothermal liquefaction of unsegregated municipal solid waste	HPCL-New Generation Ideation Contest		

**Fellowships of academies and professional societies**

S. No.	Faculty Member	Date of Admission
<b>INAE</b>		
1	Prof. S. Pushpavanam	1 November 2020
<b>FRASC</b>		
1	Dr Rajnish Kumar, Fellow of the Royal Society of Chemistry (FRSC)	1 October 2020

**Journal Editorial Boards**

S. No.	Faculty Member	Position (Editorial Advisory Board)	Journal Name
1.	Prof. Rajagopalan Srinivasan	Associate Editor	<i>Frontier Energy Research (Process and Energy Systems Engineering)</i>
2.	Prof. Rajagopalan Srinivasan	Associate Editor	<i>Process Safety and Environmental Protection</i>
3.	Prof. Rajagopalan Srinivasan	Associate Editor	<i>PLOS One</i>
4.	Prof. Rajagopalan Srinivasan	Associate Editor	<i>South African Journal of Chemical Engineering</i>
5.	Prof. Sreenivas Jayanti	Member	<i>Results in Engineering, Elsevier Publication</i>
6.	Dr Rajnish Kumar	Member	<i>Energy &amp; Fuel ACS Engineering AU</i>

**4.4.4. Design and Development Activities****New facilities added or major equipment procured**

S. No.	Equipment	Value (Rs. in lakh)
1	Scanning Electrochemical Microscope (Manufacturers: Metrohm, Netherlands; Sensolytics, Germany; Zeiss, Germany)	~100
2	High vacuum mid- and far-IR spectrometer with ATR set-up; manufacturer: JASCO, Japan	~40

**Patents****Patents filed**

S. No.	Faculty Member	Topic of Patent
1.	Dr Raghuram Chetty	A remote monitoring system for a stand-alone power generation system and method thereof
2.	Dr Vinu R	Rotary kiln incinerator for generating energy from municipal solid waste (MSW)
3.	Dr Aravind Kumar Chandiran	White light emission from single semiconductor material based on trivalent mixed halide double perovskites
4.	Raghunathan Rengaswamy	Tubular PEM fuel cell and cell stack thereof
5.	Basavaraja Madivala Gurappa	Method for preparation of porous mullite ceramic from pickering emulsion
6.	Sridharakumar Narasimhan	System and method for providing monitoring and control of a supply in a cyber-physical environment
7.	Kannan A	A method for maximizing multicomponent adsorption of the solutes from an aqueous stream discharge
8.	Sridharakumar Narasimhan	Continuous flow process and apparatus for manufacture of dl-2-nitro-1-butanol
9.	Sreenivas Jayanti	Flip-flop serpentine flow field for electrolyte distribution in electrochemical cells

**Patents awarded**

S. No.	Faculty Member	Topic of Patent
1	Dr Raghuram Chetty	Redox electrolytic fuel cell for desalination coupled wastewater treatment
2	Dr Rajnish Kumar, Prof. T Pradeep and their students	A process for low temperature, low pressure synthesis of gas hydrates, Patent No. 356814

**4.4.5. Research and Consultancy****Sponsored research projects (ongoing and new)**

S. No.	Coordinators	Funding Agency	Title	Period	Amount (Rs. in lakh)
1.	Dr Nagarajan R	Department of Science & Technology	Materials and processing for enhanced solar cell performance-FIST 2016	31 March 2017-30 March 2022	385.00
2.	Dr Sreenivas Jayanti (PI); Dr Varadaraju U V, CY; Dr Swarup K S, EE; Dr Raghuram Chetty, CH; Dr Kothandaraman R, CY; Dr Raghunathan Rengasamy, CH	Impacting Research Innovation and Technology - IMPRINT	Development of 10 kW/50 kWh Redox Flow Battery System for Solar PV Applications	16 February 2017-31 March 2022	399.84
3.	Dr Vinu R (PI), Dr Chakravarthy S R, AE; Dr Prasad B V S S S, ME; Dr Sundararajan T, ME	Uchhatar Avishkar Yojana - IIT Madras	Waste heat recovery boiler using municipal solid waste: Analysis, model testing and pilot plant design commissioning and testing	13 July 2017-12 July 2021	557.00
4.	Dr Sridharakumar Narasimhan (PI); Dr Balasubramaniam K K, CY; Dr Shankar Narasimhan S, CH; Dr Shankar Balachandran, CS; Dr Nirav Bhatt, BT	Uchhatar Avishkar Yojana - IIT Madras	Continuous manufacturing of dl-2-amino-l-butanol	27 October 2016-26 April 2021	130.00
5.	Dr Sridharakumar Narasimhan (PI); Dr Shankar Narasimhan S, CH; Dr Murty B S, CE	Department of Science & Technology	New strategies for optimal operation of water supply schemes by use of scheduling and decentralized infrastructure	15 March 2018-20 December 2021	134.87
6.	Dr Renganathan T (PI); Dr Pushpavanam S, CH; Dr Indumathi M. Nambi, CE; Dr Ravi Krishna R, CH; Dr Raghavendra Sai V V, AM	Department of Science & Technology	AMR and pollutants: interactive studies and novel sensor technologies	17 February 2018-16 August 2021	322.46
7.	Dr Ravi Krishna R (PI); Dr Sachin S Gunthe, CE; Dr Shiva Nagendra S M, CE	Ministry of Environment and Forests	National Carbonaceous Aerosols Programme (NCAP) Working Group-III project	30 March 2017-29 June 2022	399.47
8.	Dr Susy Varughese (PI); Dr Enakshi Bhattacharya, EE; Dr Parag Ravindran, ME	Alumni Association	Support the natural environment and wildlife of IIT Madras campus	21 July 2017-31 July 2021	6.00
9.	Dr Aravind Kumar Chandiran (PI)	Council of Scientific and Industrial Research	Coordination frameworks for solar energy conversion	2 May 2018-1 May 2021	19.32

S. No.	Coordinators	Funding Agency	Title	Period	Amount (Rs. in lakh)
10.	Dr Rajnish Kumar (PI); Dr Jitendra Sangwai, OE	Department of Science & Technology	Bench scale studies for gas hydrate based continuous gas separation process: separation of industrially relevant binary and ternary gas mixture like CO <sub>2</sub> /H <sub>2</sub> , CO <sub>2</sub> /CH <sub>4</sub> /H <sub>2</sub> S and CH <sub>4</sub> /N <sub>2</sub> /H <sub>2</sub>	19 November 2018-18 November 2021	45.75
11.	Dr Aravind Kumar Chandiran (PI)	Department of Science & Technology	Ferroelectric photo electrochemical water splitting	26 November 2018-25 November 2021	70.28
12.	Dr Sridharakumar Narasimhan (PI); Dr Shankar Narasimhan S, CH; Dr Murty B S, CE; Dr Ravindra Gettu, CE	Department of Science & Technology	Water distribution and sewer networks	23 October 2018-22 October 2023	33.08
13.	Dr Aravind Kumar Chandiran (PI)	Board of Research in Nuclear Sciences	Studies on the development of devices using MXenes/2D materials for energy harvesting applications	28 May 2018-27 May 2021	34.98
14.	Dr Abhijit Deshpande P (PI)	Office of the Principal Scientific Adviser	Rural Technology Action Group (RuTAG) - Phase-IV	1 August 2018-31 July 2021	210.57
15.	Dr Arun K Tangirala (PI)	Science and Engineering Research Board	Detection and diagnosis of model-plant-mismatch in model predictive control schemes	15 November 2018-14 November 2021	10.05
16.	Dr Rajnish Kumar (PI); Dr Mohan S, CE	Scheme for Promotion of Academic and Research collaboration	Next-generation multifunctional aerogels for treating soluble microplastics, pesticides and drugs in water, and recovery	15 March 2019-14 September 2021	78.48
17.	Dr Raghunathan Rengasamy (PI); Dr Basavaraja M Gurappa, CH	Uchhatar Avishkar Yojana - IIT Madras	Enabling technologies for enhancing access of medicines in India through point-of-demand production of oral dosage forms	7 May 2018-6 May 2021	200.00
18.	Dr Preeti Aghalayam (PI); Dr Selvam P, CY; Dr Niket Kaisare, CH	Uchhatar Avishkar Yojana - IIT Madras	A low-cost option for the catalytic reduction of automotive NOx in lean burning engines	1 November 2018--31 October 2021	130.00

S. No.	Coordinators	Funding Agency	Title	Period	Amount (Rs. in lakh)
19.	Dr Vinu R (PI); Dr Anand K, ME	Department of Science & Technology	Waste to engine low temperature combustion of sustainable green fuels - DST - UKIERI	19 June 2019-18 June 2021	4.90
20.	Dr Nagarajan R (PI)	Department of Biotechnology	Decellularized extracellular matrix for treating cardiac injury	2 January 2020-31 December 2021	14.99
21.	Dr Aravind Kumar Chandiran (PI); Dr Raghunathan Rengasamy, CH; Dr Swagatika Sahoo, CH	Department of Biotechnology	Genetic engineering of microbes and regulation of charge transfer dynamics for high performance biophotovoltaics	21 June 2019-20 June 2023	183.37
22.	Dr Aravind Kumar Chandiran (PI); Dr Raghuram Chetty, CH; Dr Somnath Chanda Roy, PH; Dr Tiju Thomas, MM	Department of Science and Technology	Earth abundant and scalable two-dimensional catalysts for selective photo-electrochemical solar conversion of carbon dioxide to methane/ methanol	17 September 2019-16 September 2022	99.46
23.	Dr Sumesh P Thampi (PI); Dr Basavaraja M Gurappa, CH	Science and Engineering Research Board	Guiding hydrodynamically interacting micro-swimmers	28 March 2019-27 March 2022	40.17
24.	Dr Raghuram Chetty (PI); Dr Aravind Kumar Chandiran, CH	Science and Engineering Research Board	Design and development of bimetallic nanostructured photocatalyst for selective conversion of carbon dioxide to fuels	26 March 2019-25 March 2022	60.98
25.	Dr Ravi Krishna R (PI)	Science and Engineering Research Board	Chemical composition of atmospheric fine particles (PM <sub>2.5</sub> ) over a South Indian City, Nellore	19 November 2018-18 November 2021	10.05
26.	Dr Raghunathan Rengasamy (PI)	Science and Engineering Research Board	Extreme learning machine based pitch angle prediction for uniform power generation and load mitigation using HIL simulator of digital hydraulic pitch system in wind turbine	25 October 2019-24 October 2022	10.05
27.	Dr Ramanathan S (PI)	Science and Engineering Research Board	Electrochemical biosensor for detections of cardiac biomarker (Troponin-cTnI and cTnT) using chitosan modified mesoporous hollow CNT @ NiMn-LDH nanocomposite	27 January 2020-26 January 2022	22.37

S. No.	Coordinators	Funding Agency	Title	Period	Amount (Rs. in lakh)
28.	Dr Niket Kaisare (PI); Dr Anand K, ME; Dr Basavaraja M Gurappa, CH	Science and Engineering Research Board	Fundamental studies on water-in-diesel emulsions as alternative fuels	11 February 2020-10 February 2023	67.14
29.	Dr Jithin John Varghese (PI)	Science and Engineering Research Board	Aqueous-phase mild oxidation of methane to methanol on atomically dispersed catalysts: mechanistic insights and solvent effects from first principles	26 December 2019-25 December 2021	32.89
30.	Dr Rajagopalan Srinivasan (PI); Dr Rajnish Kumar, CH; Dr Jitendra Sangwai, OE	Scheme for Promotion of Academic and Research collaboration	Natural gas value chain management	28 March 2019-27 September 2021	94.68
31.	Dr Sridharakumar Narasimhan (PI)	Scheme for Promotion of Academic and Research collaboration	A framework for quantifying the resilience of complex networks: applications to water distribution networks and power grids	30 April 2019-29 October 2021	74.98
32.	Dr Aravind Kumar Chandiran (PI); Dr Kamalesh Hatua, EE	Impacting Research Innovation and Technology - IMPRINT	Development of a prototype metal air battery driven electrical drive for a city bus duty	17 December 2019-16 December 2022	149.16
33.	Dr Ethayaraja Mani (PI)	Department of Science & Technology	High-throughput synthesis of non-spherical plasmonic nanoparticles for applications in sensing	5 February 2021-4 February 2024	41.74
34.	Dr Pushpavanam S (PI); Dr Nirav Bhatt, BT	Department of Science & Technology	Setting up a zero discharge pilot plant to process 100 kg of PCB to recover lead, tin and copper	28 September 2020-27 September 2023	308.70
35.	Dr Rajagopalan Srinivasan (PI); Dr Niket Kaisare, CH	Board of Research in Nuclear Sciences	Cost effective eye tracking approaches to analyze human-machine-interface in nuclear power plants	10 July 2020-9 July 2022	35.76
36.	Dr Raghunathan Rengasamy (PI); Dr Sridharakumar Narasimhan, CH; Dr Shankar Narasimhan S, CH	Defence Research and Development Organisation	Power draw allocation from a network of fuel-cell stack	3 February 2021-2 February 2022	26.40
37.	Dr Sreenivas Jayanti (PI)	Dr Sreenivas Jayanti (PI)	Modelling of flow, electrochemical and thermal phenomena in high temperature pem fuel cells	12 March 2021-11 March 2023	26.85



S. No.	Coordinators	Funding Agency	Title	Period	Amount (Rs. in lakh)
38.	Dr Ramanathan S (PI)	Science and Engineering Research Board	An SEIR model to estimate the effect of pharmaceutical and non-pharmaceutical interventions on the spread of COVID-19	16 July 2020-15 July 2021	5.50
39.	Dr Susy Varughese (PI); Dr Abhijit Deshpande P, CH	Science and Engineering Research Board	Understanding the microstructure and rheology of root derived mucilage and its interactions with soil in the context of plant physiology	30 December 2020-29 December 2023	72.09
40.	Dr Basavaraja M Gurappa (PI)	Science and Engineering Research Board	Dynamics of patterns in Belousov-Zhabotinsky reaction tailored by graphene-based nanocomposites	15 December 2020-14 December 2023	10.05
41.	Dr Ramanathan S (PI)	Science and Engineering Research Board	Synthesis of a novel, highly hydrophobic and antimicrobial organic inhibitors for corrosion protection applications of mild steel in acidic medium	21 December 2020-20 December 2023	10.05
42.	Dr Ethayaraja Mani (PI); Dr Basavaraja M Gurappa, CH	Science and Engineering Research Board	Engineering of interfaces to destabilize Pickering emulsions	8 March 2021-7 March 2024	67.26
43.	Dr Tarak Kumar Patra (PI)	Science and Engineering Research Board	Molecular design of highly permeable polymer grafted nanoparticle membranes	22 December 2020-21 December 2022	29.23
44.	Dr Basavaraja M Gurappa (PI); Dr Sumesh P Thampi, CH	Science and Engineering Research Board	Investigation of the role of evaporation driven flows in the self-assembly of nanoparticles	25 December 2020-24 December 2023	43.47
45.	Dr Himanshu Goyal (PI)	National Supercomputing Mission	Application of high-performance computing and machine learning to design multiphase reactors for clean energy applications	12 March 2021-11 March 2023	23.94
46.	Dr Tarak Kumar Patra (PI)	National Supercomputing Mission	Molecular design of polymeric ionic liquid for energy storage materials	12 March 2021-11 March 2023	35.22

**Industrial consultancy projects (ongoing and new)**

S. No.	Coordinators (PI/Co-PI)	Funding Agency	Title	Period	Amount (Rs. in lakh)
1.	Dr Raghunathan Rengasamy	Gyan Data Private Limited	Control studies of AIP module in submarines	31 December 2020-1 July 2042	10.00
2.	Dr Sreenivas Jayanti	Hindustan Petroleum Corporation Limited	Technology development and demonstration of vanadium redox flow battery for solar PV applications	14 June 2021-1 July 2043	35.40
3.	Dr Raghunathan Rengasamy	Dassault Aviation	New AI-based methods for bizjets prognostic/predictive maintenance	30 June 2022-1 July 2044	64.98
4.	Dr Raghunathan Rengasamy	Saint Gobain India Private Limited (Research & Development)	Digital twin for induction furnace	15 December 2020-1 July 2045	6.02
5.	Dr Rajnish Kumar	Saint Gobain India Private Limited (Research & Development)	CO <sub>2</sub> capture	26 March 2021-1 July 2046	11.80
6.	Dr Raghunathan Rengasamy, Dr Babji Srinivasan	Vellayan Subbiah	DOTS: An IOT platform for application in healthcare industries	2 June 2021-1 July 2047	41.30
7.	Dr Arun K Tangirala	GITAA Private Limited	Consultant for education initiatives	31 March 2023-1 July 2048	20.00
8.	Dr Sridharakumar Narasimhan	Amara Raja Batteries Limited	Wireless monitoring and control of water networks	15 February 2021-1 July 2049	4.85
9.	Raghunathan Rengasamy, Mahesh Panchagnula, AM	Royal Challengers Sports Private Limited	Analytics for RCB	30 June 2021-1 July 2050	35.00
10.	Aravind Kumar Chandiran	Mahindra Electric Mobility Limited	Postmortem analysis of batteries	14 July 2021-1 July 2051	8.79
11.	Rajnish Kumar, Niket Kaisare	GAIL India Limited	R&D Project on waste water purifications and recycle by GAS hydrate process	10 January 2022-1 July 2052	53.81
12.	Preeti Aghalayam, Jithin John Varghese	Daimler India Commercial Vehicles Private Limited	A novel method for on-board NOx utilisation via deep oxidation: phase 1	26 September 2021-1 July 2053	25.96

**RBIC projects (ongoing and new)**

S. No.	Faculty Member (PI/Co-PI)	Agency Name	Title	Period	Sanction Value (in lakh)
1.	Dr Raghunathan Rengasamy	Robert Bosch Engineering Am Dbusiness Solutions Private Limited	Fundamental methods to incorporate domain knowledge into selected machine learning techniques	8 May 2018-3 August 2022	10.00
2.	Dr Sridharakumar Narasimhan (PI); Dr Nirav Bhatt, BT	Robert Bosch Engineering and Business Solutions Private Limited	Online data analysis for rapid identification and monitoring of reaction systems based on multi-sen	25 October 2018-3 August 2022	24.00
3.	Dr Abhijit Deshpande P	Indian Oil Corporation Limited	Integrated Pottery Development in Tiruvallur	16 May 2019-30 June 2021	64.58
4.	Dr Sridharakumar Narasimhan (PI); Dr Shankar Narasimhan S, CH; Dr Ravindran B, CS	Robert Bosch Centre for Data Science and Artificial Intelligence	Data-driven monitoring of water distribution networks	24 February 2020-23 February 2022	22.20
5.	Dr Nagarajan R	Fullerton India Credit Company Limited	Promotion of social entrepreneurship among schools, higher institutions and social enterprises	1 April 2019-15 August 2022	80.50
6.	Dr Abhijit Deshpande P	Pan Alumni Leadership Series - IITM ACT	RuTAG-PALS Project	1 August 2020-31 July 2022	5.25
7.	Dr Abhijit Deshpande P (PI); Dr Susy Varughese, CH; Dr Basavaraja M Gurappa, CH; Dr Ethayaraja Mani, CH; Dr Sumesh P Thampi, CH	Common Code	Testing for equipment in Polymer Engineering and Colloid Science Group	27 October 2018-26 October 2023	15.90
8.	Dr Abhijit Deshpande P; Dr Susy Varughese, CH	ABB India Ltd.	Novel natural polymer based blends for adhesive applications	13 May 2016-31 May 2021	29.80
9.	Dr Sreenivas Jayanti	Engineers India Limited	Expert consultancy services for development of 3D CFD gasifier	10 February 2020-31 March 2022	33.04
10.	Dr Sridharakumar Narasimhan	Amara Raja Batteries Limited	Wireless monitoring and control of water networks	15 November 2020-15 April 2021	4.85

S. No.	Faculty Member (PI/Co-PI)	Agency Name	Title	Period	Sanction Value (in lakh)
11.	Dr Abhijit Deshpande P; Dr Susy Varughese, CH; Dr Basavaraja M Gurappa, CH; Dr Ethayaraja Mani, CH; Dr Sumesh P Thampi, CH	Common Code	Testing for Polymer Engineering and Colloid Science Group	27 October 2018-26 October 2023	5.00
12.	Dr Raghunathan Rengasamy; Dr Shankar Narasimhan S, CH; Dr Ravindran B, CS	GE India Technology Centre Private Limited	Data analytics for aluminum smelters	1 June 2016-1 July 2021	48.00
13.	Dr Rajnish Kumar, Dr Pradeep T, CY; Dr Jitendra Sangwai, OE	Gas Authority of India Limited	Methane production from marine hydrate deposits: bench scale studies for methane recovery by carbon dioxide replacement	1 January 2018-20 June 2021	185.26
14.	Dr Pushpavanam S; Dr Renganathan T, CH	Bharat Heavy Electricals Limited	Establishment of a bench scale demonstration plant to process typical e-waste and recover valuable metals through a green hydrometallurgical route	15 January 2019-15 July 2021	37.16
15.	Dr Basavaraja M Gurappa; Dr Abhijit Deshpande P, CH	CHV Energy Tech Co	Investigation of wax deposition and wax-pipe wall interaction	1 April 2018-31 May 2021	35.40
16.	Dr Vinu R; Dr Chakravarthy S R, AE	Sea6 Energy Private Limited	Development of a 100 L batch hydrothermal liquefaction facility for converting seaweeds to chemicals/fuels	1 December 2018-31 May 2021	10.00
17.	Dr Vinu R	Renault Nissan Technology & Business Centre India Private Limited	Testing of catalysts for ethanol combustion	15 May 2018-31 July 2021	63.15
18.	Dr Sridharakumar Narasimhan; Dr Shankar Narasimhan S, CH	Bharat Heavy Electricals Limited	Smart water network monitoring, management and control for BHEL Trichy	1 October 2019-31 August 2021	24.85
19.	Dr Abhijit Deshpande P	High Energy Materials Research Laboratory	Rheology of composite propellant suspension under high shear and extension	15 May 2019-9 July 2021	9.94

S. No.	Faculty Member (PI/Co-PI)	Agency Name	Title	Period	Sanction Value (in lakh)
20.	Dr Vinu R	Shell India Markets Private Ltd	Improving the selectivity of ethylbenzene hydroperoxide during the oxidation of ethylbenzene in the SMPO process - phase 3	1 April 2019-30 June 2021	12.53
21.	Dr Vinu R	Shell India Markets Private Ltd	Kinetics of hydrolysis and hydrodeoxygenation of biomass, biomass model compounds, plastics and mixtures	1 March 2020-31 December 2021	34.55
22.	Dr Vinu R	Exxon Mobil Research and Engineering Company	A holistic approach for biomass conversion to sugars and chemicals via hydrogenolysis using H-donor solvents and heterogeneous catalysts	1 May 2019-30 April 2022	204.72
23.	Dr Rajagopalan Srinivasan; Dr Raghunathan Rengasamy, CH	Exxon Mobil Research and Engineering Company	Assessing the supply chain necessary for India's evolution to a gas-based economy	1 July 2019-30 June 2021	70.00
24.	Dr Raghunathan Rengasamy	Ford Motor Company	Towards accelerated product design with domain knowledge augmented machine learning models	1 June 2019-31 December 2021	70.93
25.	Dr Pushpavanam S.	EW2WE Ecotechnologies Private Limited	Market survey for setting up an ewaste recycling unit	1 August 2019-31 July 2021	2.60
26.	Dr Vinu R; Dr Nagarajan R, CH; Dr Raghavan V, ME; Dr Chakravarthy S R, AE	Sukhbir Agro Energy Limited	Technology development for biomass based thermal power plants	18 November 2019-17 November 2024	188.09
27.	Dr Sridharakumar Narasimhan; Dr Shankar Narasimhan S, CH	Heterogenous Communication Technologies Private Limited	IoT enabled monitoring systems for rural drinking water supply systems	19 December 2019-18 December 2022	36.89
28.	Dr Rajnish Kumar Dr T. Pradeep and other faculty members from IITM and other Institutes	Science & Engineering Research Board	National Facility of Cryo-Electron Microscopy: remotely operable, 24x7 for academia and industry	18 December 2020-	286.00
29.	Dr Ramanathan S, Dr Srirama Srinivas, EE	GAIL India Limited	Quantification of AC induced corrosion rate in buried pipelines - measurement and physical process model	9 March 2020-5 March 2022	111.74

S. No.	Faculty Member (PI/Co-PI)	Agency Name	Title	Period	Sanction Value (in lakh)
30.	Dr Sreenivas Jayanti	Hindustan Petroleum Corporation Limited	Technology development and demonstration of vanadium redox flow battery for solar PV applications	1 February 2021-31 January 2022	35.40
31.	Dr Raghunathan Rengasamy	Dassault Aviation	New AI-based methods for bizjets prognostic/predictive maintenance	1 July 2020-30 June 2022	64.98
32.	Dr Rajnish Kumar	Saint Gobain India Private Limited (Research & Development)	CO <sub>2</sub> capture	27 October 2020-31 December 2021	11.80
33.	Dr Raghunathan Rengasamy; Dr Babji Srinivasan, AM	Vellayan Subbiah	DOTS: An IOT platform for application in health care industries	2 November 2020-2 June 2021	41.30
34.	Dr Raghunathan Rengasamy; Dr Mahesh Panchagnula, AM	Royal Challengers Sports Private Limited	Analytics for RCB	15 December 2020-30 June 2021	35.00
35.	Dr Aravind Kumar Chandiran	Mahindra Electric Mobility Limited	Postmortem analysis of batteries	15 January 2021-14 July 2021	8.79
36.	Dr Rajnish Kumar; Dr Niket Kaisare, CH	GAIL India Limited	R&D Project on waste water purifications and recycle by GAS hydrate process	11 January 2021-10 January 2022	53.81
37.	Dr Preeti Aghalayam; Dr Jithin John Varghese, CH	Daimler India Commercial Vehicles Private Limited	A novel method for on-board NOx utilisation via deep oxidation: phase 1	29 March 2021-26 September 2021	25.96

### Retainer consultancy (ongoing and new)

S. No.	Faculty Member	Industry	Title	From	To	Amount (Rs. in lakh)
1.	Dr Shankar Narasimhan S	Gyan Data Private Limited	Technical advice for data analytics projects	7 December 2016	31 March 2022	20.00
2.	Dr Shankar Narasimhan S	Gnanam Institute for Training in Advanced Analytics Private Limited	Lectures in Data Analytics	1 November 2018	31 March 2023	22.16
3.	Dr Arun K Tangirala	GITAA Private Limited	Consultant for education initiatives	1 April 2020	31 March 2023	20.00

**4.4.5. Other Activities of the Department****Results obtained in research work (from M.S. and Ph.D. thesis) of the scholar/faculty**

S. No.	Roll No	Name	Title	Guide
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**The following Dual Degree (M.S.+Ph.D.) scholars were awarded the degree during D3P held virtually on 22 November 2020**

1	CH14D013	Srivalli H	Mechanistic study of leaching of sodium and potassium from an Indian coal using ultrasonic and additive methods	Prof. R. Nagarajan
2	CH14D405	Mohd. Faheem Ullah	Data science techniques for control loop performance assessment and root cause diagnosis	Prof. Raghunathan Rengasamy
3	CH14D408	Ramya K A	Mechanistic study of relaxation processes in structured materials using oscillatory rheology	Prof. Abhijit P Deshpande
4	CH14D412	Varghese Kurian	Operation of intermittent water networks: models, methods and performance analysis	Prof. Sridharakumar Narasimhan - Guide, Prof. Shankar Narasimhan - Co-Guide
5	CH14D414	Avula Reddy Thulasi Ram	An algorithm for finding the global optimum of a difficult-to-evaluate, multimodal, multidimensional function to a given tolerance and its application to flow distribution problems	Prof. Sreenivas Jayanti
6	CH15D200	Thota Krishnaveni	Modeling of mixing enhancement and particle separation in a microchannel	Prof. S. Pushpavanam-Guide, Prof. T. Renganathan, Co-Guide
7	CH15D404	Leo Lukose	Role of shapes on efficient thermal convection in containers: energy flux vectors, heatlines and entropy generation	Prof. Tanmay Basak - Guide
8	CH15D405	Palla Sridhar	Multiscale modeling of adsorptive hydrogen storage in metalorganic frameworks	Prof. Niket S. Kaisare - Guide

**The following Dual Degree (M.Tech+Ph.D.) scholars were awarded the degree during D3P held virtually on 22 November 2020**

9	CH15D206	Akash Choudhary	Hydrodynamics of phoretic particles: effects of inertia and non-Newtonian stresses	Prof. S. Pushpavanam-Guide, Prof. T. Renganathan - Co-Guide
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**The following Doctor of Philosophy - Ph.D. were awarded the degree during D3P held virtually on 22 November 2020**

1	CH12D003	Kalpana Sarojini K G	Dynamics of colloidal droplets during impact, coalescence and drying on the substrates	Prof. Susy Varghese - Guide, Prof. Sarit Kumar Das - Co-Guide
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S. No.	Roll No	Name	Title	Guide
2	CH13D007	Silveru Upendar	A study of aggregation of oppositely charged colloids in relation to emulsion stabilization and their controlled demulsification	Dr Ethayaraja Mani - Guide, Dr Basavaraja M Gurappa - Co-Guide
3	CH13D010	Sundari R	Hydrodynamics, mass transfer and reactions in two-phase flows in a microchannel	Prof. S. Pushpavanam
4	CH13D019	Ashna R	Anti-solvent and nanoparticle induced microstructure and rheology of cellulose/ ionic liquid (IL) solutions	Dr Basavaraja M Gurappa
5	CH14D001	Bontapalle Sujitkumar Anteshwarrao	Studies on conducting PEDOT:PSS thin films with special reference to ageing and interface modification	Prof. Susy Varughese - Guide
6	CH14D009	Sudhakar Kathari	Novel measures and methods for causality analysis of linear dynamical systems	Prof. Arun K Tangirala - Guide
7	CH14D018	Durgadevi A	CO <sub>2</sub> Capture and conversion using chemical absorption and photo catalysis	Prof. S. Pushpavanam - Guide, Prof. Somnath Chanda Roy, PH - Co-Guide
8	CH15D007	Ranjith P M	Studies on corrosion and anodic dissolution of tantalum in acidic fluoride media	Prof. S. Ramanathan - Guide
9	CH15D016	Ravendra Gundla Palli	Optimal performance conditions and scale-up criteria for vanadium redox flow batteries	Prof. Sreenivas Jayanti
10	CH15D017	Ranajit Mondal	Controlled evaporation driven self-assembly of ellipsoids	Dr Basavaraja M Gurappa - Guide

**The following Master of Science by Research - M.S. were awarded the degree during D3P held virtually on 22 November 2020**

1	CH15S014	Anupam Abha	Micro-kinetic modelling and experimental studies of selective catalytic reduction of NO over gold catalyst	Dr Preeti Aghalayam
2	CH15S020	Sreeja Narayanan	Modelling of cavity growth in underground coal gasification	Dr Preeti Aghalayam
3	CH16S301	M Prasanna	Monitoring and operation of water distribution networks	Prof. Sridharakumar Narasimhan - Guide, Prof. Shankar Narasimhan - Co-Guide
4	CH17S005	Sumithra Reddy Yerasi	Hybrid lattice Boltzmann simulations of viscoelastic fluid flows	Dr Sumesh P Thampi - Guide, Dr Abhijit P Deshpande - Co-Guide



S. No.	Roll No	Name	Title	Guide
5	CH17S006	Danam Mahesh	Production of bio-crude via hydrothermal liquefaction of municipal solid waste and biomass-polymer mixtures	Dr R. Vinu - Guide, Dr Rajnish Kumar - Co-Guide
6	CH17S007	Saurabh Nagapati Hegde	CFD Modeling of bubble column reactors using advanced linear equation solvers	Dr Sreenivas Jayanti - Guide
7	CH17S008	Mohd Shahrukh	Mathematical programming based optimal procurement of LNG cargoes from long term contracts and spot market	Prof. Rajagopalan Srinivasan

### International collaboration achievements by the department

#### Student visit

S.No	Students	Purpose of Visit	Date and Venue
1	Namrata Gaikwad (CH16D017)	Research Collaboration - SPARC	January-December 2020, National University of Singapore

#### Activities initiated

1.	Department Advisory Board Meeting (online)	22 July 2020
2.	D3P - 57th Convocation 2020 (Virtual); Chief Guest: Lalit Mahajan, Chairman and Managing Director, J Mitra & Co. Private Limited	22 November 2020

#### Faculty achievements/matters

1.	Dr Raghu Rengasamy has published a book titled <i>Process Control Fundamentals: Analysis, Design, Assessment, and Diagnosis</i> with CRC Press in May 2020.
2.	Prof. T. Panda retired from services w.e.f June 2020.
3.	Prof. YBG Varma, a retired doyen of the department who passed away in April 2020, was honored for his significant contributions to Chemical Engineering with Dr B. P. Godrej Lifetime Achievement Award 2019 by the Indian Institute of Chemical Engineers (IChE) at its annual session held at IIT Delhi in December 2019.
4.	Prof. S. Pushpavanam is on sabbatical leave from 19 October 2020-15 October 2021 for setting up a pilot plant to process e-waste in BHEL Trichy (a DST grant project).
5.	Prof. Rajagopalan Srinivasan, Department of Chemical Engineering, has been appointed as Advisor, Alumni Relations and taken over the charge for two years with effect from 18 January 2021.
6.	Dr Sumesh P Thampi was promoted as Associate Professor w.e.f. 19 March 2021 (afternoon).

#### Faculty achievements in News

7.	Dr Aravind Kumar Chandiran: <b>IIT Madras researchers discover new material to split hydrogen and water using solar power:</b> Dr Aravind Kumar Chandiran, Assistant Professor, Department of Chemical Engineering and the Solar Energy Research Group (SERG) of the institute, together specialise in developing materials and devising architecture for solar cells, solar water splitting to hydrogen fuels, carbon dioxide recycling, and metal-air batteries for electric vehicles.
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8.	Dr Ethayaraja Mani: <b>Researchers develop simple technique for assembly of nanorods:</b> Recognising that a method to assemble gold nanorods (rod-shaped) will open various avenues of its applications, IIT Madras researchers have developed a simple technique for assembly of nanorods.
9.	Dr Preeti Aghalayam: <b>IIT Madras team develops game about COVID</b> As part of a new elective course, Let Us Play to Learn, introduced in the curriculum, students designed and developed board and card games on complex science and engineering concepts, including COVID-19, which would be used in classroom teaching from the upcoming semester.
10.	Dr Raghunathan Rengasamy and Prof. Shankar Narasimhan: <b>IIT Madras launches dedicated cell to help industries cut down energy consumption and boost the manufacturing sector</b> Prof Raghunathan Rengaswamy said, "As more assessments are performed, this initiative will enable us to assess the potential for implementing cutting-edge data science and AI technologies for manufacturing excellence in SMEs (small and medium-sized enterprises) in the near future."
11.	Dr Raghuram Chetty: <b>IIT Madras researchers develop nano-coated filter for healthcare workers treating COVID-19 patients</b> Indian Institute of Technology Madras researchers have developed a nano-coated filter media for healthcare workers treating COVID-19 patients. This filter has applications not only in healthcare, but also in defence applications and other areas, where air filtration of submicron particles is required.
12.	Dr Rajagopalan Srinivasan: <b>Brainwaves study can tell if a worker can handle crisis situation, finds IIT Madras research.</b> Researchers at Indian Institute of Technology (IIT) Madras have found a method to determine whether a worker has the mental capacity to handle a crisis in a factory or other high-stress jobs by measuring their brainwaves using an electroencephalogram (EEG).
13.	Dr Sreenivas Jayanti: <b>IIT-M researchers develop alternatives to conventional Li-ion batteries.</b> Researchers have made significant advances in developing alternatives to conventional lithium-ion and lead-acid batteries for industrial usage. Such advances are crucial as India is aiming to achieve 40 per cent of its total electricity generation from non-fossil fuel sources such as solar and wind by the year 2030.

**Staff matters**

14. Shri K. Thirunavukkarasu, Technical Superintendent, retired from the service in February 2021.

**Student achievements**

15.	Shrey K. Patel, a Chemical Engineering undergraduate student, along with his team, Team Enigma, won the MIT COVID-19 Challenge: India-Turning the Tide, organised by the Massachusetts Institute of Technology (MIT) during 28-30 August 2020. It was a 48-hour-long Hackathon where participants from all around the world came together to solve few of the most pressing challenges faced by people in this pandemic.
16.	Sakshi Gupta, a Chemical Engineering undergraduate, and her Team CreDebt emerged as winners in the track, Addressing Key Challenges Faced By Micro, Small and Medium-Sized Enterprises for their solution that involved provisioning of competitive, cheaper credit for unregistered MSMEs through a cooperative loan approval system.
17.	A three-credit elective course, Building Towards a Career in Chemical Industry was introduced in January 2020. The course is intended to introduce students to industrial practices and requirements.
18.	The department now offers four minor streams that may be selected by UG students—Polymers, Systems Engineering, Energy and Environment and Soft Matter.

19.	Akash Choudhary, doctoral scholar (CH15D206), Department of Chemical Engineering has been awarded the Humboldt Research Fellowship for Postdoctoral Researchers. He is guided by Prof. S. Pushpavanam and Dr T. Renganathan.
20.	Chemplus 2021: In association with ChES and AIChE IITM, the Department of Chemical Engineering conducted the 14th annual technical edition of technical festival, Chemplus 2021 from 26-28 March 2021. Previously, being a separate event for undergrads (ChemClave) and postgrads (ChemSymp), Chemplus has transformed into an event that incorporates both the fun part in engineering as well as the research element of a symposium. The prime events organised during Chemplus 2021 were Plenary Lecture series, E-Games, ChemE Art, ChemE Quiz, Paper presentation and Workshops. For career enthusiasts, we had a brand-new event organised during this edition of Chemplus, ChemE Panel; a panel discussion on Careers in Chemical Engineering delegated for by our accomplished alumni and moderated by Dr Jithin Varghese.

### Plenary Lectures Overview

1.	Biologics and Vaccine: Dr Satyanarayana
2.	Next Gen PSE and Sustainable Chemical Engineering: Dr Rafiqul Gani
3.	Women in STEM: Dr Preeti Aghalayam
4.	Data Analytics in FMCG: Mr Amit Singhal
5.	Carbon Neutral Society: Dr Ryo Ohmura

### Paper presentation topics

1.	Materials
2.	Fundamentals and Systems
3.	Energy and Environment

### Workshops

1.	Data Science and Machine Learning with Python
2.	MATLAB
3.	ANSYS
4.	DWSIM
5.	Aspen

### IIT Madras students who bagged prizes

#### Paper presentation event

1.	Sriram Krishnamurthy (CH17D012) - First Place (Materials Theme)
2.	Debjyoti Bhattacharya (CH19M011) - First Place (Materials Theme)
3.	Saveri Puchalapalli (CH19S011) - Second Place (Materials Theme)
4.	Akhil Kongara (CH17D201) - Second Place (Materials Theme)
5.	Anoop P Pushkar (CH18D200) - First Place (Fundamentals and Systems Theme)
6.	Vamsi Vikram G (CH16D201) - Second Place (Fundamentals and Systems Theme)
7.	Muhammed Hamdan (CH18D015) - First Place (Energy and Environment Theme)
8.	Harisankar S (CH20D750) - Second Place (Energy and Environment Theme)

#### Chem E Quiz

1.	Vani Vindhya Syamala - First Place
2.	Diksha Khakal, Saveri Puchalapalli - First Place
3.	Divyansh Raka, Achanta Rajkamal - Third Place

**Chem E Talk**

1.	Frederick J (CH20M016) - First Place
2.	Debjyoti Bhattacharya (CH19M011) - Second Place

**Post-Doctoral Fellow @ChE**

S. No.	Roll No.	PDF	Mentor	DOJ
1	CH18IPF02	R. Sai Harish	Dr Sridharakumar Narasimhan	20 April 2018
2	CH18IPF03	Dr Lakshmi Prasad Gurralla	Dr R Vinu	4 October 2018
3	CH18IPF04	M. Joyce Nirmala	Dr R. Nagarajan	28 November 2018
4	CH18IPF05	T.G. Vignesh	Dr S. Pushpavanam	26 December 2018
5	CH19IPF02	Sheen Mers SV	Dr S. Ramanathan	4 April 2019
6	CH19IPF03	Santhana Krishnan P	Dr Preeti Aghalayam	6 May 2019
7	CH19IPF07	A.Tamilselvan	Dr A. K. Chandiran	15 July 2019
8	CH19IPF08	S. Pavan Kumar	Dr Sumesh P Thampi	13 August 2019
9	CH19IPF10	S. Gopinath	Dr S. Pushpavanam	29 November 2019
10	CH19IPF11	Gurram Venkata Ramesh Babu	Dr Jithin John Varghese	9 December 2019
11	CH20IPF06	Anusha Thampi V V	Dr S. Ramanathan	1 September 2020
12	CH20IPF02	Subhajit Dutta	Dr Himanshu Goyal	29 September 2020
13	CH20IPF05	D. Sangamithirai	Dr S. Ramanathan	1 December 2020
14	CH20IPF04	Nitai Chandra Maji	Dr Basavaraja and Dr Niket Kaisare	1 December 2020
15	CH21IPF01	Bhuvaneshvar Kumar	Dr Tanmay Basak	1 January 2020
16	CH20IPF02	K. Alamelu	Dr Aravind Kumar Chandiran	23 November 2020
17	CH21R003	Laya Das	Dr Rajagopalan Srinivasan	18 February 2021
18	CH21R004	Padma Ishwarya S	Dr Basavaraja M. Gurappa and Dr Shantanu Pradhan (BT)	1 March 2021
19	CH21R002	Abiraman T	Dr Sridharakumar Narasimhan and Dr P Selvam (CY)	8 February 2021
20	CH1920936SERB008129	Ramanathan S	Dr Nivedhini Iswarya C	27 January 2020
21	CH19-20/937/DSTX/008158	K Ram Kumar (DST Fellowship)	Dr R Nagarajan	9 September 2019
22	CH19-20/837/DSTX/008158	Shiny P J (DBT Fellowship)	Dr R Nagarajan	2 January 2020

## 4.5. Department of Chemistry

### 4.5.1. Introduction

The Department of Chemistry was a part of the Department of Chemical Engineering from 1959-1961 and became an independent department in 1961 with Prof. V. Srinivasan as the Head-in-Charge. Prof. M.V.C. Sastri assumed charge as the first Head of the Department in November 1961. He was instrumental in building the department as well as the Applied Chemistry Building (completed in 1973). Prof. Sastri was also responsible for the Special Instruments Laboratory (established in 1970; later known as RSIC and presently known as SAIF), and the MSRC (established in 1974 with Prof. Sastri as the Head and Prof. V. Srinivasan as the Associate Head).

### 4.5.2. Academic Programmes

The department offers M.Sc. and Ph.D. programmes in chemistry. As on date, 1,020 students have graduated with the M.Sc. degree and 773 students with the Ph.D. degree. Various aspects of chemistry are also taught at the preparatory level (for weaker section students) and in the B.Tech. programme (core as well as minor stream courses in chemistry). The department is well equipped with modern instrumentation facilities and actively engaged in performing quality teaching and research in frontier areas.

### Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
M.Sc.	60	59				120
Ph.D.	43	39	52	34	107	274
<b>Total</b>	<b>103</b>	<b>99</b>	<b>52</b>	<b>34</b>	<b>107</b>	<b>394</b>

### Students/scholars who won outside prizes and awards

S. No	Student/Scholar	Prize	Awarded by
1	Kinshuk Debsharma	Sir C V Raman Award of Excellence	The Indian Chemical Society in collaboration with Jadavpur University
2	Ganapathi Rao Kandregula (CY17D038) (guided by Dr Kothandaraman R)	Best Poster Presentation, held online at Center for Advanced Materials, Qatar University, Qatar, entitled, Materials of the Future: Smart Applications in Science and Engineering, 29-31 March 2021. The title of the presentation was 'Drastic improvement in dye-sensitized solar cell efficiency by electrosorption-based dye staining of titania semiconductor photoanode'	
3	Dr S. Jagadeeswari	Received The Best Young Women Award for Research from Genesis of Educational Impressions, Roorkee. She was mentored by Prof. Indrapal Singh Aidhen and Dr Kothandaraman Ramanujam.	

4	Kingshuk Debsharma, (CY16D041) (guided by Prof. Edamana Prasad)	Sir C V Raman Award of Excellence (first rank) for presentation of his poster, A gelation-induced enhanced emission active donor-acceptor fluorophore as a dual channel sensor for cyanide with hydrophobic surface formation, during National Science Day 2021 and National Seminar on Material Chemistry - Today & Tomorrow organised by the Indian Chemical Society in collaboration with Jadavpur University	
5	Dr Koushik Saha (CY14D065) (guided by Prof. Sundargopal Ghosh)	Alexander von Humboldt Fellowship	
6	Vipin Kumar Pandey (CY17D006) (guided by Dr Arnab Rit)	Won third position for presentation of his poster, Catalyst- and solvent-free efficient access to N-alkylated amines via reductive amination using Hbpin, at the International Seminar on Current Trends in Chemical and Pharmaceutical Sciences (CTCPS-2021) held virtually	
7	Deepan Chowdhury (CY17D030) (guided by Dr Md. Mahiuddin Baidya)	Won the Dr J.M. Dasgupta Award for presentation of his poster, Harnessing free amine directing group in Ruthenium-catalyzed C-H bond activation/annulation reaction for natural product scaffolds, at the International Conference on Recent Trends in Chemical Sciences (RTCS-2020) organised by the Indian Chemical Society, Kolkata.	

### 4.5.3. Faculty and Their Specialisation

#### Faculty

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Sankararaman S., Ph.D. (Victoria, Canada)	Synthetic and mechanistic organic chemistry
Dhamodharan R., Ph.D. (U. Mass, USA)	Chemistry of macromolecules
Mishra A. K., Ph.D. (IIT Kanpur)	Physical photochemistry, fluorescence spectroscopy
Pradeep T., Ph.D. (IISc, Bangalore)	Solid state chemistry, materials science
Sangaranarayanan M. V., Ph.D. (IISc, Bangalore)	Electrochemistry
Selvam P., Ph.D. (IIT Madras)	Catalysis, solid state chemistry
Archita Patnaik, Ph.D. (BHU)	Physical chemistry, colloid and interface science, nanoscience and nanotechnology
Baskaran S., Ph.D. (IIT Kanpur)	Organic synthesis and asymmetric synthesis
Indrapal Singh Aidhen, Ph.D. (University of Pune)	Synthetic organic chemistry, synthetic carbohydrate chemistry and synthesis of biologically and medicinally important targets
Mangala Sunder K., Ph.D. ( <b>Head</b> ) (McGill, Canada)	Theoretical spectroscopy, magnetic resonance and molecular spectra; quantum chemistry and quantum information processing, online digital content development and online teaching; technology enhanced learning

Name and Qualifications	Major Areas of Specialisation
Vidyasagar K., Ph.D. (IISc, Bangalore)	Solid state chemistry
Bhyrappa P., Ph.D. (IISc, Bangalore)	Bioinorganic, supramolecular and materials chemistry of porphyrinoids
Ranga Rao G., Ph.D. (IISc, Bangalore)	Materials chemistry, solid state electrochemistry, surface chemistry and heterogeneous catalysis
Sanjay Kumar, Ph.D. (IIT Kanpur)	Theoretical chemistry, quantum chemistry
Narasimha Murthy N., Ph.D. (IISc, Bangalore)	Bio-inorganic chemistry, inorganic chemistry, spectroscopy
Dillip Kumar Chand, Ph.D. (IIT Kanpur)	Supramolecular chemistry, inorganic chemistry
Sekar G., Ph.D. (IIT Kanpur)	Enantioselective organic synthesis
Sundaragopal Ghosh, Ph.D. (IIT Bombay)	Organometallic and metalloborane chemistry
Rajakumar B., Ph.D. (IISc, Bangalore)	Atmospheric chemistry, gas-phase kinetic and high-resolution cavity ring down spectroscopy, computational chemistry
Muraleedharan K. M., Ph.D. (RRL, Trivandrum)	Bioorganic chemistry, medicinal chemistry
Prasad Edamana, Ph.D. (RRL, Trivandrum)	Divalent lanthanide and dendrimer chemistry
Arti Dua, Ph.D. (IISc, Bangalore)	Statistical mechanics, polymer theory, stochastic processes
Ramesh Gardas, Ph.D. (South Gujarat University)	Solution thermodynamics, ionic liquids
<b>Associate Professors</b>	
Debashis Chakraborty, Ph.D. (University of Gottingen, Germany)	Organometallic chemistry
Pazhamalai Anbarasan, Ph.D. (IISc, Bangalore)	Design and development of new synthetic methodologies based on carbenes trifluoromethylation and trifluoromethylthiolation synthesis of therapeutically important natural products
Kothandaraman R., Ph.D. (IISc, Bangalore)	Electrochemical systems and electrocatalysis
Jeganmohan M., Ph.D. (NTHU, Taiwan)	Metalcatalyzed organic reactions, total synthesis and asymmetric synthesis
Beeraiah Baire, Ph.D. (IISc, Bangalore)	Organic synthesis
Md Mahinddin Baidya, Ph.D. (LMU, Munich, Germany)	Designer catalysis for organic synthesis asymmetric synthesis, photoredox catalysis, C-H bond activation, synthesis of natural products
Venkatakrishnan P., Ph.D. (IIT Kanpur)	Organic functional materials
<b>Assistant Professors</b>	
Kartik Chandra Mondal, Ph.D. (Karlsruhe Institute of Technology, Germany)	Inorganic chemistry
Arnab Rit, Ph.D. (University of Muenster, Germany)	Organometallic chemistry and catalysis, main-group chemistry
Hema Chandra Kotamarthi	Molecular biophysics/biophysical chemistry
Yamijala S R K Chitanya Shrama	Application of nonadiabatic molecular dynamics (NAMD) methods, electronic structure (DFT) and ab initio molecular dynamics methods



### Short-term courses/workshops/seminars/symposia/conferences attended by faculty members

S. No.	Faculty Member	Purpose of Visit	Institution and Period
1	Prof. Sekar G	Ph.D Viva Voce Examination	IIT Kanpur, 27 June 2020
		Ph.D Viva Voce Examination	IIT Bombay, 9 July 2020
		M.Sc. Project Viva Voce Examination	B.S. Abdur Rahman Crescent Institute of Science & Technology (for nine students), 10 July 2020
		Ph.D. Viva Voce Examination	IIT Hyderabad, 13 July 2020
		Chemical Research Society of India (CRSI) council meeting	15 July 2020
		CRSI general body meeting	16 July 2020
	The Academy of Sciences (Chennai) council meeting	24 July 2020	
2	Prof. Sundargopal Ghosh	Second and Third council meeting	Indian Chemical Society
3	Prof. Ramesh L Gardas	Ph.D. Viva Voc Examination	JNTU Anapatur, 7 July 2020 NISER, Bhubaneswar, 13 July 2020
4	Dr Beeraiah Baire	Ph.D. Viva Voce Examination	Vikrama Simhapuri University, Nellore, Andhra Pradesh, 29 February 2020
		Ph.D. Viva Voce Examination	JNTU Hyderabad, 9 June 2020
5	Prof. Bhyrappa P	Faculty recruitment	Kannur University, Kerala, 3-4 July 2020
		CSIR-NET question paper setting	CSIR, New Delhi, 10-25 July 2020
6	Prof. Ranga Rao G	Ph.D. Viva Voce Examination	JNTU Hyderabad, 10 July 2020
		Expert Member - Faculty Recruitment	GITAM University, Visakhapatnam, 6-7 June 2020
7	Dr Venkatakrishnan P	DC meeting	SRM University, Chennai, 8 June 2020
		Ph.D. Viva Voice Examination	IIT Roorkee, 23 August 2020
8	Prof. Sangaranarayanan M V	Ph.D. Viva Voce Examination	IIT Hyderabad, 7 March 2020
		Editorial Board meeting of the Bulletin of Materials Science	JNCASR Bangalore, 17 July 2020
		SERB meeting	New Delhi, 23 July 2020
		Research Council meeting	CECRI Karaikudi, 24 July 2020
		Ph.D. Viva Voce Examination	PSG College of Technology-Coimbatore, 27 July 2020
9	Prof. Mangala Sunder	New Faculty recruitment at IISER Thiruvananthapuram, review of academic profiles of current faculty members of the Department of Chemistry at the same IISER	Several days during December 2020-March 2021



10	Prof. Sanjay Kumar	Organised and chaired a session at the symposium: Spectroscopy and Dynamics of Molecules and Clusters (SDMC) 2020	20-23 February, 2020, Fateh Safari Lodge, Kumbhalgarh, Rajasthan, India
		Lecture at the International Conference on Structure and Dynamics of Molecular and Condensed Matter Systems (ICSD-2020)	1-4 March 2020, Holiday Resort, Puri, Odisha, India

### Special lecture (webinar) delivered by faculty in other institutions

S. No.	Faculty Member	Topic of the Lecture	Venue and Date
1	Dr Beeraiah Baire	Green Chemistry Principles	Vikrama Simhapuri University, Nellore, Andhra Pradesh, 29 February 2020
		NMR Spectroscopy: Tool for Structural Elucidation	KBN College, Vijayawada, Andhra Pradesh, 30 May 2020
		The Synthesis and Reactivity of Unprecedented gem-Dihaloketones: The $\alpha,\alpha$ -Dihalo- $\beta$ -Acetoxyketone Building Blocks	Faculty Development Program on Recent Advances in Chemical Sciences, Department of Chemistry, SRM Institute of Science and Technology, Kattankulathur, 11 July 2020
		Unravelling the Details of Unexpected Results in Research: The Synthetic Organic Chemist View	Chemistry Lecture Series for research scholars and faculty members, Department of Chemistry, SRM Institute of Science and Technology, Kattankulathur, 28 July 2020
2	Prof. Sangaranarayanan M V	Interfacial Electrochemistry-Progress and Prospects	IISER Thirupathi, 28 May 2020
		Analysis of Electrochemical Systems-Challenges and Opportunities	Sathyabama Institute for FDP, 8 July 2020
3	Prof. Sekar G	Asymmetric Synthesis of Chiral Alcohols	National Webinar on Synthesis and Application of Bioactive Organic Molecules, B. S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, 19 June 2020
		Metal-Carbon Covalent Bond Stabilized Transition Metal Nano-catalysts, Plenary Lecture	International Virtual Conference on Recent Advances in Organic Medicinal and Biological Chemistry, VIT Chennai, 8 July 2020
		Asymmetric Synthesis of Chiral Alcohols	Sathyabama Institute of Science and Technology, Chennai, 11 July 2020
		Asymmetric Synthesis of Chiral Alcohols	Summer Training Program (STP-2020) in Chemistry Academy of Sciences, Madras University, Chennai, 22 July 2020



S. No.	Faculty Member	Topic of the Lecture	Venue and Date
4	Prof. Ramesh L Gardas	Formulations of Research Proposal and Objectives	Online workshop on Research Methodology Maharshi Dayanand University, Rohtak, Haryana, 16 May 2020
		Few Tips on Literature Search and Organization	Faculty Development Program-cum-Webinar, Amity University, Noida, Uttar Pradesh, 26 May 2020
		Green Solvents for Sustainable Developments in Chemical and Technological Applications	National-Level Faculty Development Program on Multidisciplinary Approach Towards Emerging Trends in Science and Humanities (MASH-2020), Ramachandra College of Engineering, Eluru, Andhra Pradesh, 3 June 2020
		Tips on Effective Ways of Scientific Literature Search	Webinar, Chennai Institute of Technology, Tamil Nadu, 11 June 2020
		Tips to Avoid Your Next Paper Getting Rejected	National webinar, Amrutvahini College of Engineering, Sangamner, Maharashtra, 13 June 2020
		Careers with Science	Webinar on "Research Opportunities in Area of Science" organised by KPES Science College, Bhavnagar, CSIR-CSMCRI and MK Bhavnagar University, Gujarat, 15 June 2020
		Effective Paper Writing Ways and Selection of Journals	FDP on Research Capacity Building (UGC STRIDE scheme), V.O. Chidambaram College, Thoothukudi, 16 June 2020
		Few Tips to Use Lockdown Time for Research Progress	Online FDP, Jain University, Bangalore, 17 June 2020
		How to Search and Analyse Effectively to Get Relevant and Latest Literature: Few Time-Saving Tips	Webinar, Jyothi Engineering College, Thrissur, 25 June 2020
		Effective Use of Lockdown Time to Enhance Your Scientific Writing and Networking Skills	Webinar, SSN College of Engineering, Chennai, 2 July 2020
		Scientific Writing Tips for Funding Proposals and Journal Publications	Online FDP, organised by Arunai International Research Foundation, Tiruvannamalai, Elsevier India Private Limited and Annamalai University, Tamil Nadu, 3 July 2020
		How to Search Scientific Literature and Collaborator for Project Proposals and International Publications: Do's & Don'ts	Online FDP, Commissionerate of Collegiate Education, Vijayawada, 4 July 2020
		Green Solvents for Sustainable Developments in Chemical and Technological Applications: Challenges and Opportunities	Online Interdisciplinary FDP Shri Guruji Gobind Singhji Institute of Engineering and Technology, Nanded, Maharashtra, 7 July 2020
		A Few Tips on Scientific Literature Search and Writing Skills: Do's & Don'ts	Webinar, Homi Bhabha National Institute, Mumbai, Maharashtra, 15 July 2020

S. No.	Faculty Member	Topic of the Lecture	Venue and Date
5	Prof. Pradeep T	Ionic Liquids as Green Solvents for Sustainable Developments in Chemical and Technological Applications	Online FDP, Kongu Engineering College, Erode, 20 July 2020
		A Few Tips on Scientific Literature Search and Writing Skills: Do's & Don'ts	Online FDP, Ilahia College of Engineering and Technology, Muvattupuzha, Kerala, 25 July 2020
		Deep Eutectic Solvents: Introduction, Properties and Applications	Webinar sponsored by the Scheme for Promotion of Academic and Research Collaboration (SPARC) under Ministry of Education, Government of India, jointly organised by Indian Institute of Technology Guwahati (India), Universidade Nova De Lisboa (Portugal), and Federal University of Rio De Janeiro (Brazil), 29 July 2020
		Introduction, Properties and Applications of Ionic Liquids as Environmentally Benign Solvents for Sustainable Developments	Webinar, Sri Meenakshi Government Arts College for Women, Madurai, 30 July 2020
		Environmentally Benign Solvents for Sustainable Developments: Introduction, Properties and Applications	International Webinar on Chemistry for the Societal Advancement, jointly organised by Dr B.R. Ambedkar University, Srikakulam and Andhra Pradesh Akademi of Sciences, Amaravathi, Andhra Pradesh, 18 August 2020
		COVID-19: Challenges and Opportunities in Chemistry Research	Webinar on Challenges in Chemistry Research in the post-COVID 19 era, jointly organised by K. L. University, Akademi of Sciences, Amaravathi, Andhra Pradesh, 21 August 2020
		Interview: Visiting scientist or Post-doc position	ICCW, 2 September 2020
		Centre for Excellence meeting - with Profs Cooks, Hahn Horst Kappes, Manfred, Robert L Whetten, Ras Robin and others	4 September 2020
		International Day of Clean Air for Blue Skies (a resolution adopted by the UN General Assembly)	Government Madhav Science P.G. College, Ujjain (Madhya Pradesh), 7 September 2020
		The second meeting of the Technical Committee for Examination and Use of Innovations and Technologies in Drinking Water and Sanitation Sector	Department of Drinking Water and Sanitation, 29 September 2020
Meeting with District Collector of East Kameng, Arunachal Pradesh (ICCW)	Arunachal Pradesh, 12 October 2020		

S. No.	Faculty Member	Topic of the Lecture	Venue and Date
6	Prof. Ranga Rao G	9th Meeting of the Programme Advisory Committee (PAC) in the area of Inorganic & Physical Chemistry	SERB, New Delhi, 14-16 October 2020
		Impact of Inaction, New Technologies and Mass Implementation	ICCW, 7 October 2020
		Topic: Affordable Excellence: Doing Science in India	Singularity 2020 - Science Council of IISER Bhopal, 16 October 2020
		How to Build Academia-Industry Linkage in Colleges?	Lecture Series (under Paramarsh Scheme by UGC), Farook College, Kozhikode, Kerala, 22 October 2020
		Insight-Exploring Beyond Imagination	Indian Institute Technology Jammu, 23 October 2020
		Future of Our Universities	Kerala Sasthra Sahithya Parishad State Committee, 57th Annual Conference, 26 October 2020
		Clean Water Using Nanotechnology: Science, Technology and Entrepreneurship	King Abdullah University of Science and Technology (KAUST), Kingdom of Saudi Arabia, 28 October 2020
		BOS meeting	Audisankara College, Gudur, Andhra Pradesh, 7 September 2020
		Doctoral Committee meeting	VIT Vellore, 7 October 2020
		Hydrogen Production Using Indigenous Ceria-based Materials by Thermocatalytic Method	National Symposium on Recent Trends in Chemical Sciences (NSRTCS-2020) organised by IIT Tirupati, 3-4 October 2020
Hydrogen Production Using Indigenous Ceria-based Materials by Thermocatalytic Method	One-day workshop on Accelerating Hydrogen and Fuel Cell Technology, organised by International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Centre for Fuel Cell Technology, IITM Research Park, 8 October 2020		
7	Prof. Mangala Sunder K	Microwave Spectroscopy of Semirigid Molecules and Molecular Complexes	Dr BR Ambedkar University, Srikakulam, Andhra Pradesh 24 September 2020
8	Prof. Muraleedharan K M	Current Scenario on Affordability, Availability and Quality of Drugs for Various Diseases	Vaishvik Bhartiya Vaigyanik (VAIBHAV) Summit, 19 October 2020

**Special lecture (webinar) delivered by faculty members/visitors**

S.No.	Faculty Member	Topic of Lecture	Institute	Date
1	Prof. Ramesh Gardas L	Few Tips on Literature Search and Organization	Department of Chemistry, IIT Madras	27 April 2020
2	Prof. Thalappil Pradeep	How Can Chemistry Make a Difference for Clean Water?	Department of Chemistry, IIT Madras	15 May 2020
3	Prof. Rajakumar B	Chemistry and its Influence on Global Warming and Climate	Department of Chemistry, IIT Madras	5 June 2020
4	Prof. Sankaran Subramanian, Adjunct Faculty	Dancing with the Electrons: Electron Spin Resonance Imaging and its Implications in Cancer Research		12 June 2020
5	Prof. Vijayamohan K Pillai, Adjunct Faculty	Phosphorene Quantum Dots: Preparation, Heteroatom Doping and Possible Applications	Indian Institute of Science Education and Research, Tirupati 517507	19 June 2020
6	Prof. K. S. Viswanathan, Adjunct Faculty	Non-Covalent Interactions: Close Encounters of the Third Kind	Department of Chemical Sciences, Indian Institute of Science Education & Research Mohali	26 June 2020
7	Prof. N. Chandrakumar, Emeritus Professor	The Discovery of Spin or Rather, the 'Covery' of Spin, and After!		10 July 2020
8	Dr Karthik Raman, Department of Biotechnology, IIT Madras	Learning and Predicting Novel Metabolic Pathways Through Subgraph Mining		17 July 2020
9	Prof. P. Ramamurthy, Adjunct Faculty	Carbon Dots: New Material with Fluorescence Sensing and Imaging, and Donor-Acceptor Properties		24 July 2020
10	Dr Rajappa Vaidyanathan, Adjunct Faculty	Development of Robust, Environmentally Responsible Processes: The Tofacitinib Story	Chemical Synthetic and Analytical Development BBRC, Bengaluru	31 July 2020

### Honours and awards obtained by faculty

S. No.	Faculty Member	Award	Awarded by
1	Prof. Pradeep T	Padma Shri for 2020	Government of India
		CRSI Silver Medal for 2020	Chemical Research Society of India (CRSI)
		Nikkei Asia Prize, 2020	Nikkei Inc.
		Chairman, Board of Governors, IINST Mohali, 2020	Indian Institute of Nano Science and Technology Mohali
		Elected Fellow, 2019	The World Academy of Sciences (TWAS)
		Member, Advisory Board, Nanoscale Advances	Royal Society of Chemistry
		Member, Advisory Board of ChemComm	Royal Society of Chemistry
2	Prof. Sankararaman S	Fellow, FNA 2019	Indian National Science Academy
		Chairperson, Empowerment and Equity Opportunities for Excellence	Science and Engineering Research Board (SERB), DST, India
		Chairperson, Organic PAC	SERB, DST, India
3	Prof. Baskaran S	Fellow, FNA 2019	Indian National Science Academy
4	Prof. Sanjay Kumar	INSA Teacher Award, 2019	Indian National Science Academy
5	Prof. Sundargopal Ghosh	Joined as Associate Editor of Inorganica Chimica Acta from June 2020	Inorganica Chimica Acta
6	Prof. M V Sangaranarayanan	Fellow, 2020	Electrochemical Society of India
7	Prof. Dillip Kumar Chand	Institute Mid-Career Research & Development Award for 2019	IIT Madras
		Fellow, 2020	Indian Chemical Society, Kolkata
8	Prof Sekar G	Fellow, 2019	The National Academy of Sciences, Allahabad
		Joint Secretary, CRSI, 2020-2023	Chemical Research Society of India
		NOST council member, 2019-2022	National Organic Symposium Trust (NOST), India
		Co-opted member, Programme Advisory Committee (PAC) of Organic Chemistry, 2021-2024	SERB, DST, India
		Member of the Screening Committee of DST "SERB-SUPRA," 2020-2021	SERB, DST, India

S. No.	Faculty Member	Award	Awarded by
		Executive Council Member, 2020	The Academy of Sciences, Chennai
		Convener of CRSI - Chennai Local Chapter, 2020-2023	CRSI
		Golden Jubilee Alumni Endowment Award Lecture 2020	Department of Organic Chemistry, University of Madras, Chennai
		Regional Coordinator (Chennai), KVPY (2019 and 2020)	Kishore Vaigyanik Protsahan Yojana (KVPY) Examination, IISc Bangalore
9	Prof Rajakumar B	Fellow, 2020	The National Academy of Sciences, Allahabad
		Fellow, FRSC 2020	Royal Society of Chemistry, UK
		Bronze Medal, CRSI 2020	CRSI
10	Prof. Ramesh L Gardas	Member of Board of Studies	Krishna University, Andhra Pradesh
		Member of Board of Studies	P.P. Savani University, Gujarat
		Member of Board of Studies	SR University, Warangal, Telangana
		Institute Mid-Career Research and Development Award for the year 2019-20	IIT Madras
		Associate Editor, Journal of Chemical & Engineering Data	American Chemical Society, USA
		Editorial Board Member	Open Chemistry, De Gruyter
		Editorial Board Member	Molecules, MDPI
		Editorial Board Member	Open Chemistry, De Gruyter
		Fellow, FRSC 2019	Royal Society of Chemistry, UK
		Fellow, FTAS 2019	Telangana Academy of Sciences, Hyderabad
		Fellow, FASC 2020	The Academy of Sciences, Chennai
		Fellow, FAPAS 2020	Andhra Pradesh Akademi of Sciences, Amaravathi
		Executive Committee Member, 2021	Society for Advancement of Chemical Sciences and Education (SACSE), IGCAR, Kalpakkam
I&EC Research 2020: Recognised one among 35 Notable Contributors in I&EC Research	American Chemical Society, USA, Journal: <i>Industrial &amp; Engineering Chemistry Research</i>		

S. No.	Faculty Member	Award	Awarded by
11	Prof Kothandaraman R	Fellow, FRSC 2020	Royal Society of Chemistry, UK
		Fellow, FASC 2020	The Academy of Sciences, Chennai
		Vice President, ISEAC, 2021-24	Indian Society for Electroanalytical Chemistry (ISEAC), BARC, Mumbai
		Guest Editor, focus issue: Energy Storage in China, in 2021	<i>Journal of the Electrochemical Society</i> , USA
12	Prof Jeganmohan M	Fellow, FRSC 2019	Royal Society of Chemistry, UK
13	Prof Anbarasan P	SwarnaJayanti Fellowship 2019-20	Department of Science & Technology, India
		2020 AVRA Young Scientist Award	ACVRA Laboratories, Hyderabad
		Young Scientist Award (Saraswathy Srinivasan Prize), 2020	The Academy of Sciences, Chennai
		Bronze Medal, CRSI 2020	CRSI
14	Dr P. Anbarasan	Young Scientist Award 2020 of the Academy of Sciences	Academy of Sciences, Chennai
15	Prof. Ramesh L Gardas	Invited to serve as an Editorial Board Member of <i>Green Chemistry Letters and Reviews</i> , Taylor & Francis publication, invited to serve as an Associate Editor of <i>Journal of Chemical &amp; Engineering Data</i> , an American Chemical Society publication, for three years with effect from 1 January 2021.	
16	Prof. Sankaran Subramanian	Elected as a Fellow of the International Society of Magnetic Resonance (ISMAR). There are only four other fellows of ISMAR from India.	
17	Prof. B. Rajakumar	Elected as Fellow of The National Academy of Sciences, India (NASI) for 2020	
18	Prof. Mangala Sunder K.	Nominated to NASSCOM IT-IteS Sector Skill Council as Eminent Academician member of the Governing Council, renewed for the period 2021-2022; nominated as Co-chairman for the Future Skills Prime Programme Review and Steering Group by the Ministry of Electronics and Information Technology	



**4.5.4. Research and Consultancy****Sponsored research projects (ongoing and new)****List of Consultancy project under Department of Chemistry for the Financial year 2020 - 2021**

S. No.	Type	PI Name	Agency Name	Title	Start Date	Close Date	Sanction value
1.	IC	Ranga Rao G	Suven Life Sciences Limited	Technical opinion on the preparation of Ferric	01/07/2044	31/01/2022	5.90
2.	CR	Kothandaraman Ramanujam	Tide Water Oil company (India) Limited	Converting spent zinc carbon and zinc based alkaline batteries into a	01/07/2047	22/03/2023	20.83
3.	RC	Sankararaman S	Alikem Laboratories Limited	Alkem Laboratories Consulting service	01/08/2020	31/07/2021	7.08
4.	ET	Pradeep T	Common Code	Analytical Services Using Advanced Instrumental Facilities	20/01/2021	19/01/2026	5.00
5.	IT	Pradeep T	Common Code	Providing Drinking Water kiosk using CDI Techonology	20/01/2021	19/01/2026	5.00
6.	CR	Pradeep T	Indian Oil Corporation Limited	for Chokkanathanpatti village in Kappalur village Panchayat in Madurai district of Tamil Nadu	12/02/2021	31/05/2021	19.84

S.No.	PI Name	Agency Name	Title	Period	Amopunt (Rs. in lakh)
1	Prof. Pradeep T and Prof. Sundargopal Ghosh	Department of Science & Technology	Carborane-protected metal nanoclusters: a new family of materials with atomic precision	6 October 2020-5 October 2023	Rs 37.50 lakh
2	Dr Kothandaraman Ramanujam	Indian Space Research Organisation	Meso-microporous core-shell carbon-based materials and electroactive diluent for long cycle life and high energy density Li-S batteries	29 October 2020-28 October 2022	Rs 25 lakh
3	Dr Hema Chandra Kotamarthi	NFSG	Dissecting the chemo-mechanical coupling mechanism of Mycobacterial tuberculosis proteasome activator (Mpa) and Disaggregase (ClpB) using single-molecule force-spectroscopy	12 October 2020-11 October 2023	Rs 28 lakh

Due to COVID-19 and its impact on the department, considerable activities have been carried out through electronic means only.

## 4.6 Department of Civil Engineering

### 4.6.1. Introduction

The Department of Civil Engineering has been in existence since the inception of IIT Madras in 1959. Since then, it is contributing to the nation's infrastructure development and human resource generation. The departmental activities include teaching, research, consultancy and training. These activities are carried out under different disciplines, administratively organised into five divisions,

namely Building Technology and Construction Management (BTCM), Environmental and Water Resources Engineering (EWRE), Geotechnical Engineering (GT), Structural Engineering (ST) and Transportation Engineering (TR). There are 14 well-equipped laboratories attached to these divisions. The EWRE and ST laboratories have received substantial initial funding from the Federal Republic of Germany.

### 4.6.2. Academic Programmes

The department has postgraduate programmes leading to Dual Degree, M.Tech., M.S. and Ph.D. degrees in various disciplines of civil engineering in addition to the undergraduate B.Tech. programme in civil engineering.

### New courses introduced

Course No.	Course Name	BAC	BAC Date
CE5026	Design of Steel-Concrete Composite Structures	233	29 January 2021
CE5225	Numerical Techniques in Civil Engineering	232	13 October 2020
CE5235	Understanding Climate Dynamics and its Mysteries	232	13 October 2020
CE6215	Soil-Plant-Atmosphere Continuum	232	13 October 2020
CE5215	Concrete Pavement Technology	230	9 June 2020
CE5815	Computational Geomechanics	230	9 June 2020

### New labs established

- Geosynthetic Lab - Dr K. Rajagopal
- Environmental Lab - Dr Dalli Naidu Arnepalli
- New Hydraulics Lab - Dr Venu Chandra

### Students on roll as of September 2019+M.S. and Ph.D. admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	124	111	57	47	23	362
Dual Degree	-	-	32	41	50	123
M.Tech.	92	73	<b>More than 2 years - 6</b>			171
M.B.A.	-	-	-	-	-	-
M.S.	20	18	10	4	3	55
Ph.D.	51	54	34	41	146	326

**Students/Scholars who won outside prizes and awards/Institute/Convocation Prizes****Institute Day Prize**

S. No.	Name	Roll No.	Award Name
1	Kannan Neha Rajan	CE15B101	Shri Venkataraman Ravi Prize
2	Yukti	CE16B136	MSK Chaitanya Varma Memorial Prize
3	Neduri Leela Venkata Sri Harsha	CE17B011	Computer Age Management Services Private Limited Prize
4	Mohamed Althaaf Hussain M	CE18M039	S Sambasivan Award
5	Shivakumar B	CE18M117	Prof. Gerhard Rouve Memorial Prize
6	Silpa P J	CE18M119	Smt. Jayalakshmi Narasimhan Memorial Prize

**Alumni Day Award**

1.	Praveen Koshy	CE18M018	Dronnadula Nagaratnam Reddy Award
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**Convocation Day Prizes 2020**

1	Nookala Harsha Vardhan	CE15B084	Dr NR Dave Prize
2	Swathy Manohar	CE15D036	Shree Gaayathree Devi Award
3	J Eswar Avinash	CE16B033	Larsen & Toubro ECC Endowment Prize
4	Jones Joju	CE17S006	Shri K Sreeharsha Memorial Prize
5	C G Krishnanunni	CE17S009	Shri K Sreeharsha Memorial Prize
6	Yugant Kapur	CE18M052	L&T Endowment Prize
7	Anshu Abhinav	CE18M063	Rajnikant Gandhi Memorial Award
8	Anujith K Babu	CE18M064	Prof Juergen Plaehn Prize
9	Kalluri Asha Kiran	CE18M086	Valli Anantharamakrishnan Merit Prize
10	Kalluri Asha Kiran	CE18M086	Institute Merit Prize
11	Chaudhari Ankit Anil	CE18M126	K Devarajan Memorial Prize
12	Piriya Saisujan	CE19G005	Smt Jayalakshmi and Shri R Narasiman Prize

**4.6.3. Faculty and Their Specialisations****Faculty**

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Dr Alagusundaramoorthy P, Ph.D. (IIT Madras)	Composite technology
Dr Amlan Kumar Sengupta Ph.D. (University of Missouri)	Structural engineering
Dr Appa Rao G., Ph.D. (IISc. Bangalore)	Structural engineering
Dr Arul Jayachandran, Ph.D. (IIT Madras)	Structural engineering
Dr Ashwin Mahalingam, Ph.D. (Stanford University)	Building technology and construction management
Dr Balaji Narasimhan, Ph.D. (Texas A&M University)	Water resources engineering

Name and Qualifications	Major Areas of Specialisation
Dr Benny Raphael, Ph.D. (University of Strathclyde, UK).	Building technology and construction management
Dr Boominathan A., Ph.D. (Moscow)	Geotechnical engineering
Dr Devdas Menon, Ph.D. (IIT Madras)	Structural engineering
Dr Dodagoudar G.R., Ph.D. (IIT Bombay)	Geotechnical engineering
Dr Gandhi S.R., Ph.D. (IIT Madras)	Geotechnical engineering
Dr Indumathi M. Nambi, Ph.D. (Clarkson University)	Environmental engineering
Dr Karthik K. Srinivasan Ph.D. (Texas, Austin)	Transportation engineering
Dr Koshy Varghese, Ph.D. (Texas, Austin)	Building technology and construction management
Dr Lelitha Devi, Ph.D. (Texas A&M)	Transportation engineering
Dr Ligy Philip, Ph.D. (IIT Kanpur)	Environmental engineering
Dr Manu Santhanam, Ph.D. (Purdue University)	Building technology and construction management
Dr Meher Prasad A., Ph.D. (RICE)	Structural engineering
Dr Mohan S., Ph.D. (IISc., Bangalore)	Water resources engineering
Dr Murali Krishnan J., Ph.D. (IIT Madras)	Transportation engineering
Dr Murty B.S., Ph.D. (Washington St)	Water resources engineering
Dr Murty C.V.R, Ph.D. (California Institute of Technology)	Structural engineering
Dr Nageswara Rao B., Ph.D (Iowa University)	Structural engineering
Dr Raghukanth S.T.G, Ph.D. (IISc Bangalore)	Structural engineering
Dr Rajagopal K., Ph.D. (Florida)	Geotechnical engineering
Dr Ramamurthy K., Ph.D. (IIT Madras)	Building technology and construction management
Dr Ravindra Gettu, Ph.D. (Northwestern)	Building technology and construction management
Dr Robinson R.G., Ph.D. (IISc., Bangalore)	Geotechnical engineering
Dr Saravanan U., Ph.D. (Texas A&M)	Structural engineering
Dr Satish Kumar S.R., D. Engg. (Nagoya University)	Structural engineering
Dr Satyanarayana K.N., Ph.D. (Clemson)	Building technology and construction management
Dr Shiva Nagendra S.M., Ph.D. (IIT Delhi)	Environmental engineering
Dr Sivanandan R, Ph.D. (Virginia Tech.)	Transportation engineering
Dr Srinivasan K, Ph.D. (IIT Madras)	Water resources engineering
Dr Sudheer K.P., Ph.D. (IIT Delhi)	Water resources engineering
Dr Thyagaraj T, Ph.D. (IISc Bangalore)	Geotechnical engineering
Dr Veeraragavan A, Ph.D. (Bangalore University)	Transportation engineering
<b>Associate Professors</b>	
Dr Arun Menon, Ph.D. (University of Pavia, Italy)	Structural engineering
Dr Atul Narayanan, Ph.D. (Texas A&M)	Transportation engineering
Dr Dali Naidu Arnepalli, Ph.D. (IIT Bombay)	Geotechnical engineering

Name and Qualifications	Major Areas of Specialisation
Dr Gitakrishnan Ramadurai, Ph.D. (Rensselaer Polytechnic institute)	Transportation engineering
Dr Mathava Kumar, Ph.D. (IIT Madras)	Environmental engineering
Dr Radhakrishna G. Pillai, Ph.D. (Texas A&M University)	Building technology and construction management
Dr Rupen Goswami, Ph.D. (IIT Kanpur)	Structural engineering
Dr Sachin S. Gunthe, Ph.D. (IITM Pune)	Atmospheric chemistry and physics
Dr Sivakumar Palaniappan, Ph.D. (Arizona State University)	Building technology and construction management
Dr Subhadeep Banerjee, Ph.D. (NUS, Singapore)	Geotechnical engineering
Dr Soumendra Nath Kuiry, Ph.D. (IIT Kharagpur)	Hydraulics and water resources engineering
Dr Venu Chandra, Ph.D. (IIT Kanpur)	Hydraulics and water resources engineering
Dr Vidya Bhushan Maji, Ph.D. (IISc Bangalore)	Geotechnical engineering
<b>Assistant Professors</b>	
Dr P. Alagappan, Ph.D. (Texas A&M University, USA)	Structural engineering
Dr Bhargava Rama Chilikuri, Ph.D. (Georgia Institute of Technology, Atlanta, Georgia, USA)	Transportation engineering
Dr Chandrasekhar Annavarapu, Ph.D. (Duke University, USA)	Geotechnical engineering
Dr Chandan Sarangi, Ph.D. (IIT Kanpur)	Environmental engineering
Dr Lakshmi Priya, Ph.D. (Georgia Institute of Technology)	Structural engineering
Dr Nikhil Bughalia, Ph.D. (University of Tokya, Japan)	Building technology and construction management
Dr Phanaisri Pradeep Pratapa, Ph.D. (Georgia Institute of Technology, Atlanta, USA)	Structural engineering
Dr Piyush Chaunsali, Ph.D. (University of Illinois at Urbana-Champaign, USA)	Building technology and construction management
Dr Ramesh Kannan K, Ph.D., IISc Bangalore	Geotechnical engineering
Dr Surender Singh, Ph.D., IIT Roorkee	Transport engineering
Dr Tarun Naskar, Ph.D., Indian Institute of Science, Bangalore	Geotechnical engineering
Dr Venkatraman Srinivasan, University of Illinois Urbana Champaign, USA	Environmental engineering
<b>Professor of Practice</b>	
Prof. N. Raghavan, Ph.D.	Building technology and construction management
Mr P.G. Venkatraman	Building technology and construction management
<b>Adjunct Faculty</b>	
Dr Sanjay Nimbalkar	Building technology and construction management
Dr Kumar N. Pitchumani	Building technology and construction management

Name and Qualifications	Major Areas of Specialisation
<b>Guest Faculty</b>	
Mr K. Ganesan	Building technology and construction management
<b>Visiting Faculty</b>	
Dr Hadas Mamane	Environmental engineering
<b>SPARC Visiting Faculty</b>	
Prof. Mark Gavin Alexander	
Prof. David Trejo	
Prof. Elsa A. Olivetti	

### Short-term courses/workshops/seminars/symposia/conferences/trainings organised by the faculty members

S. No.	Coordinator(s)	Title	Institution	Period
<b>Workshops</b>				
1.	Dr Ravindra Gettu	Online workshop on Recent Advances in Science and Technology of Concrete	IIT Madras	2 May 2020
2.	Dr Ravindra Gettu	Online Workshop on Resilience of Concrete Construction	IIT Madras	23 May 2020
3.	Dr S.M. Shiva Nagendra	Indoor Air Quality Movement	IIT Madras	11 December 2020
4.	Dr Bhargava Chilukuri	Advanced Techniques for Mobility and Congestion Analysis for Indian Cities	IIT Madras	26 March 2021
<b>Conferences</b>				
1	Prof. S.M. Shiva Nagendra	Winter School on Human Exposure to Indoor and Outdoor Air Pollution as part of the 5th Indian International Conference on Air Quality Management (IICAQM 2020) - Measurement, Modelling, Health Risk, and Public Policy	This event is jointly organised by the Department of Civil Engineering, IIT Madras, University of Bath (UK), Australian National University (Australia), and UFZ Helmholtz Centre for Environmental Research (Germany)	7 December 2020
2	Prof. S.M. Shiva Nagendra	IICAQM 2020	Department of Civil Engineering, IIT Madras; University of Bath, UK; Australian National University; and UFZ Helmholtz Centre for Environmental Research, Germany	9-11 December 2020
3	Dr Lakshmi Priya, Dr Rupen Goswami	Design of Steel Buildings for Earthquake and Fire	IIT Madras	15-23 March 2021
4	Dr Chandan Sarangi, Dr Soumendra Nath Kuiry	Modelling Air Quality and Hydro-meteorological Extremes over Indian Mega-cities	IIT Madras-AICTE	22-27 March 2021

**Honours, awards and new assignment obtained by faculty**

Dr Dali Naidu Arnepalli and his former students, Sandeep Bandipally (MS) and Dr Chinchu Cherian (Ph.D.), Department of Civil Engineering, won the IGS-Shri A. G. Dastidar Biennial Award for Best Paper on Ground Improvement published through Indian Geotechnical Society, for their paper, Characterization of lime-treated bentonite using thermogravimetric analysis for assessing its short-term strength behaviour, which was published in Indian Geotechnical Journal, Vol. 48, Issue 3, September 2018 (pp. 393-404).

**New Assignment**

1.	Prof. Indumathi M. Nambi, Department of Civil Engineering, has been invited to serve as a Member on the Editorial Board of Journal of Hazardous Materials, an Elsevier journal.
2.	Prof. Devdas Menon has been chosen as the first occupant of the P.C. Varghese Chair Professorship.
3.	Dr Sachin S. Gunthe, Department of Civil Engineering, has been invited to serve as a member on the Editorial Board of the Journal of Atmospheric Chemistry.

**Honours, awards and new assignment obtained by student**

- Ms. Atmakuri Priyanka, CE15D040, won the Best Paper award for her paper, Characterizing driving behaviour under mixed traffic conditions using instrumented vehicles, co-authored with her guides, Prof. R. Sivanandan and Prof. Karthik K. Srinivasan, *et al.* at the 8th Conference of the Putrajaya International Built Environment, Technology and Engineering Conference (PIBEC8) held online on 21-22 December 2020.
- Siva Poornan Vasudevan, Doctoral Scholar (CE19D750), Department of Civil Engineering, emerged as the winner of the ASCE-EMI 2020 Elasticity Student Paper Competition for his paper, Scissor-Hinge lattice structure with programmable Poisson's Ratio over large strain, organised by The American Society of Civil Engineers' Engineering Mechanics Institute (ASCE EMI) virtually on 27 May 2020.

**Faculty members participation with other institution under MoU**

S. No.	Faculty Member	Participation details	University
1	Benny Raphael	Supervision of Master's thesis	Czech Technical University, Prague

**Distinguished visitors to the department**

S. No.	Visitors and Designations	Title of the Talk	Date
1	Prof. Nguyen Thi Kim Oanh, Asian Institute of Technology, Thailand	Crop residue field burning and effects on air quality	20 November 2020
2	Prof. Mukesh Sharma, Department of Civil Engineering, IIT Kanpur	Challenges and strategy for abating PM2.5 pollution: a case study of National Capital Territory of Delhi	18 December 2020
3	Prof. Mukesh Khare, Department of Civil Engineering, IIT Delhi	Air quality management in India - way ahead	22 January 2021
4	Prof. Margaret C. Bell, CBE, Science City Professor of Transport and Environment, Newcastle University, United Kingdom	Modelling and managing air quality using data from intelligent transport system technologies	25 February 2021
5	Prof. Enda Hayes, Professor of Air Quality and Carbon Management, University of the West of England, Bristol, United Kingdom	A citizen-centred approach for air quality management: a case study from the United Kingdom and Europe	19 March 2021
6	Mr Xavier Benedict, an architect and a water historian passionately working on the conservation of Pulicat Lake	Coromandel monsoon and Pulicat Lake - making Chennai water resilient	24 March 2021

## International collaboration achievements by the department

IIT Madras-Purdue University Collaborations in Intelligent Transportation Systems by Dr Lelitha Dev

## Major infrastructure development made in the department

### Equipment purchased on department grant 2020-21

PO Date	PO No.	Description	Firm	Amount (Rs)
31 January 2020	CE/2019/0258/SPL	Steam chamber	M/s. S.G. Furnace Control Systems	120960
29 January 2020	CE/2019/0256/SPL	Workstation	M/s. Dev Systems & IT Services Private Limited	155872
31 January 2020	CE/2019/0257/SPL	HP Desktop	M/s. USAM Technology	74705
25 February 2020	CE/2019/0269/SPL	5 KVA UPS Online	M/s. Elite Power System	94,945
4 March 2020	CE/2019/0278/SPL	Dell - desktop	M/s. Dev Systems	36645
9 July 2020	CE/2019/269A/SPL	HP Computer - 2 Nos.	M/s. Sri Balaji Enterprises	73500
9 June 2020	CE/2020/0200/SPL	1.5 Split AC	Mother Aircon & C	48514
9 June 2020	CE/2020/0201/SPL	1.5 Split AC	Mother Aircon & C	48514
9 June 2020	CE/2020/0202/SPL	Furniture - Loft Box	R M Steel Works	138060
29 July 2020	CE/2020/0203/SPL	I Pad	M/s. Data Logistics	39641
6 August 2020	CE/2020/0204/SPL	Wacom tablet - 3 Nos.	M/s. Lithesha Softwares	168178
4 September 2020	CE/2020/0208/SPL	HP LED Monitor - 27"	M/s. USAM Technology	17,237
9 September 2020	CE/2020/0209/SPL	HP Printer	M/s. USAM Technology	28,560
29 September 2020	CE/2020/0210/SPL	Syringe pump controller	M/s. Septech Marketing LLP	240000
2 October 2020	CE/2020/0211/SPL	Peristaltic pumps - 2 Nos.	M/s. Miclins India Chennai	97177
6 October 2020	CE/2020/0212/SPL	Network switches	Networks	29400
26 October 2020	CE/2020/0213/SPL	All-In-One Systems	M/s. Dev Systems	57960
9 November 2020	CE/2020/0214/SPL	Laptop HP_450	USAM Technology	76314
2 December 2020	CE/2020/0216/SPL	Workstation HP	M/s. USAM Technology Solutions	393593
5 December 2020	CE/2020/0217/SPL	Network switch	M/s. Networks	29400
8 December 2020	CE/2020/0218/SPL	5 KVA UPS Numeric	Novateur Electrical & Digital Systems Private Limited	83370
9 December 2020	CE/2020/0219/SPL	Balance - weighing machine	M/s. Smart Labtech Private Limited	84000
21 December 2020	CE/2020/0220A/SPL	Samsung HD LED TV	M/s. Amazon.in	35989
24 December 2020	CE/2020/0221/SPL	All-In-One Computer	M/s. USAM Technology Solutions	104101



PO Date	PO No.	Description	Firm	Amount (Rs)
5 January 2021	CE/2020/0224/SPL	SMS Universal radial drilling machine	M/s. Montek Machinery Technology	238350
7 January 2021	CE/2020/0225/SPL	HP LED monitor - 2 Nos.	M/s. USAM Technology Solutions	27216
8 January 2021	CE/2020/0226/SPL	HP photocopier and printer	M/s. USAM Technology	187960
12 January 2020	CE/2020/0227/SPL	Weather station	M/s. Schelt Technology	249900
12 January 2020	CE/2020/0228/SPL	Digital mass flow controllers	M/s. SRS Innovative Solutions	133394
19 January 2021	CE/2020/0229/SPL	Gas purification panel	M/s. Rana Industrial Gases	82740
19 January 2021	CE/2020/0230/SPL	Data acquisition system	M/s. Hydraulic & Engineering Instruments	204750
22 January 2021	CE/2020/0231/SPL	Workstation	M/s. Dev Systems & IT Services Private Limited	165638
4 February 2021	CE/2020/0232/SPL	Chemical storage cabinet	M/s. Sterile Tech India	33600
5 February 2021	CE/2020/0233/SPL	Loft box for Room No. 206	R M Steel Works	143771
5 February 2021	CE/2020/0234/SPL	Loft box for Room No. 202	R M Steel Works	163182
5 February 2021	CE/2020/0235/SPL	Dial gauge	M/s. Baker Gauges India Private Limited	53370
9 February 2021	CE/2020/0236/SPL	Loft box for Room No. 205	R M Steel Works	143771
10 February 2021	CE/2020/0237/SPL	Visitors' chair	Visitors' chair	88500
10 February 2021	CE/2020/0238/SPL	Wooden table	M/s. Palve	34502
10 February 2021	CE/2020/0239/SPL	Acer computer	Ascent e-Digital Solutions	230355
12 February 2021	CE/2020/0240/SPL	All in one - Apple	M/s. Data Logistics	185053
12 February 2021	CE/2020/0241/SPL	Desktop - Dell	M/s. Dev Systems	58300
12 February 2021	CE/2020/0243/SPL	Sony DSLR ILCE-7MC body	M/s. Ichiban	159990
12 February 2021	CE/2020/0245/SPL	Network switch	M/s. Networks	29400
15 February 2021	CE/2020/0247/SPL	Platinum stock products	Structural Solutions Private Limited	248745
15 February 2021	CE/2020/0248/SPL	ICP Triaxial shock accelerometer	Structural Solutions Private Limited	248850
15 February 2021	CE/2020/0249/SPL	Loft box for Room No. 305	R M Steel Works	137274
24 February 2021	CE/2020/0252/SPL	Loft box for Room No. 200	R M Steel Works	134947
25 February 2021	CE/2020/0253/SPL	Bookshelf Room No. 306	R M Steel Works	82836
2 March 2021	CE/2020/0254/SPL	Dell computers and monitors	M/s. Dev Systems & IT Services Private Limited	214725

PO Date	PO No.	Description	Firm	Amount (Rs)
4 March 2021	CE/2020/0257/SPL	Worktables and chairs	M/s. Techno Seating Systems	55696
4 March 2021	CE/2020/0258/SPL	Worktables and chairs	M/s. Techno Seating Systems	55696
6 March 2021	CE/2020/0259/SPL	Biometric machine	M/s. Black Stone	24990
6 March 2021	CE/2020/0260/SPL	High-speed centrifuge	M/s. Analytic Services	94264
15 March 2021	CE/2020/0261/SPL	Samsung monitor	M/s. Prithvi Computers	14213
12 March 2021	CE/2020/0262/SPL	Dial gauge baker	M/s. Baker Gauges India Private Limited	94579
12 March 2021	CE/2020/0263/SPL	Multiple weighing units	M/s. Chem-O-Chem	45675
17 March 2021	CE/2020/0266/SPL	Wooden cupboard	M/s. Ragul Décor	105728
Total				6448595

#### Equipment purchased on project grant 2020-2021

PO Date	PO No.	Description	Firm	Amount (Rs)	Amount (in Rs.)
11 June 2020	CIE/8405/2020/1008/SPLX	60TR Water chiller	M/s. Werner Finley Private Limited	2568090.00	2568090.00
29 June 2020	CIE/2795/2020/1009/SPLX	Modular Doffing Unit	M/s. Metal Scope	420000.00	420000.00
2 July 2020	CIE/8251/2020/1010/SPLX	Mahindra E-Verito Car	M/s. Mahindra & Mahindra	1280964.00	1280964.00
9 July 2020	CIE/8190/2020/1020/SPLX	Dell Optiplex 7780 All in one	M/s. SS Information Systems (P) Limited	1545731.00	1545731.00
26 August 2020	CIE/8952/2020/1024/SPLX	Pendulum skid resistance tester	M/s. Aimil Limited	500850.00	500850.00
16 September 2020	CIE/8953/2020/1028/SPLX	High-pressure syringe pump	M/s. Septech Marketing LLP, Mumbai	1004250.00	1004250.00
12 October 2020	CIE/5034/2020/1030/SPIX	Profometer 630 AI/upgrade kit	M/s. Proceq Asia Private Limited	CHF 9564.5	7460310.00
23 October 2020	CIE/8459/2020/1032/SPIX	Amplifier with integrated digital display	M/s. Hottinger Bruel & Kjeer GmbH	€1804	155144.00
3 November 2020	CIE/8459/2020/1034/SPIX	Comprehensive force transducer	M/s. Hottinger Bruel & Kjeer GmbH	€1404	120744.00
17 November 2020	CIE/8926/2020/1036/SPIX	CSA Binder	M/s. Envirotech Instruments Private Limited, New Delhi	\$1250	92500.00

23 December 2021	CIE/8934/2020/1042/SPIX	48 Channel MASW test apparatus	M/s. HGS India Limited, Haryana	3200900.00	3200900.00
10 June 2020	CIE/USAR/2019/1044/SPI	Data acquisition system	M/s. HBM	€121607.95	104584837.00
11 November 2020	CIE/INDU/2019/1050/SPL	Flow flat	M/s. Semcotech Trading and Engineering	706798.00	706798.00
21 August 2020	CIE/KARG/2019/1061/SPL	Conversion petro fit	M/s. Aimil Limited	565990.00	565990.00
3 July 2020	CIE/KARG/2019/1067/SPL	Physisorption and chemisorption	M/s. Anton Paar	3689570.00	3689570.00
16 October 2020	CIE/8952/2019/1068/SPL	Gyratory compactor for concrete	M/s. Semcotech Trading and Engineering	M/s. Cemcoteur Trading & Engg	28,11,810.00
4 July 2020	CIE/8876/2019/1069/SPL	MGC plus 20 channels	M/s. HBM GmbH	€9685	8,32,910.00
8 December 2020	CIE/AMLA/2019/1070/SPI	LVDT and load cell	M/s. HBM Germany	€7483.6	6,43,624.00
23 November 2020	CIE/8941/2019/1072/SPL	Powder bed laying system	M/s. Tvasta Manufacturing Solutions Private Limited	846300.00	8,46,300.00
3 June 2020	CIE/INDU/2019/1075/SPL	XRF Analyser	M/s. IR Technologies Services	1575000.00	15,75,000.00
14 August 2020	CIE/8253/2019/1077/SPL	Tower Server 2X Intel Xeon Scalable	M/s. Prithivi Computers	\$5745	4,25,496.00
9 March 2021	CIE/8876/2019/1078/SPL	Strain gauge, residual stress, carbide cutters	M/s. VPG - Vishay Measurement Groups	\$5682.1	4,20,475.00
18 May 2020	CIE/LIGY/2020/D1001/SPLX	M/s. USAM Technology		160333	160333
28 May 2020	CIE/USAR/2020/D1002/SPLX	M/s. USAM Technology		66339	66339
28 May 2020	CIE/SMAT/2020/D1003/SPLX	M/s. USAM Technology		48989	48989
9 June 2020	CIE/LIGY/2020/D1008/SPLX	M/s. USAM Technology		48989	48989
11 June 2020	CIE/8251/2020/D1011/SPLX	M/s. Datalogics India Private Limited		104944	104944
11 June 2020	CIE/8251/2020/D1012/SPLX	M/s. Datalogics India Private Limited		247806	247806
11 June 2020	CIE/8478/2020/D1013/SPLX	M/s. Frontier Business System		195312	195312

11 June 2020	CIE/8347/2020/D1014/SPLX	M/s. Frontier Business System	195312	195312
18 June 2020	CIE/8251/2020/D1020/SPLX	M/s. USAM Technology	64071	64071
29 June 2020	CIE/8405/2020/D1023/SPLX	M/s. Dev Systems	86415	86415
7 July 2020	CIE/5017/2020/D1028/SPLX	M/s. Univeso Integrated Solutions (P) Limited	37800	37800
2 November 2020	CIE/AMEH/2020/D1030/SPLX	M/s. Datalogics India Private Limited	243861	243861
28 July 2020	CIE/8671/2020/D1036/SPLX	M/s. Sniper Systems and Solutions (P) Limited	102694	102694
28 July 2020	CIE/8834/2020/D1037/SPLX	M/s. Dev Systems	132950	132950
29 July 2020	CIE/8100/2020/D1038/SPLX	M/s. Sniper Systems and Solutions (P) Limited	88936	88936
7 August 2020	CIE/AMEH/2020/D1044/SPLX	M/s. Blue Hill	175000	175000
7 August 2020	CIE/AMEH/2020/D1045/SPLX	M/s. Datalogics India Private Limited	210942	210942
10 August 2020	CIE/8588/2020/D1046/SPLX	M/s. Reliance Digital	239990	239990
10 August 2020	CIE/8321/2020/D1047/SPLX	M/s. USAM Technology	77385	77385
29 July 2020	CIE/8251/2020/D1049/SPLX	M/s. Mehta Scientific Corporation	218650	218650
7 August 2020	CIE/8251/2020/D1052/SPLX	M/s. Mehta Scientific Corporation	218650	218650
25 August 2020	CIE/8502/2020/D1062/SPLX	M/s. Holmare Opto Machork Private Limited	99500	99500
26 August 2020	CIE/8237/2020/D1064/SPLX	M/s. Just Shopping Private Limited	35500	35500
1 September 2020	CIE/8893/2020/D1066/SPLX	M/s. Structural Solutions Private Limited	146055	146055
31 August 2020	CIE/8251/2020/D1067/SPLX	M/s. Element 14, Karnataka	64170	64170
1 September 2020	CIE/5036/2020/D1068/SPLX	M/s. Technocrats Intext Solution	117075	117075
1 September 2020	CIE/8941/2020/D1069/SPLX	M/s. Dev Systems	229845	229845
1 September 2020	CIE/8957/2020/D1070/SPLX	M/s. Datalogics India Private Limited	123793	123793

7 September 2020	CIE/VBMA/2020/D1072/ SPLX	M/s. USAM Technology	97220	97220
11 September 2020	CIE/TARUN/2020/ D1081/SPLX	M/s. USAM Technology	28560	28560
14 September 2020	CIE/SMSH/2020/D1085/ SPLX	M/s. Datalogics India Private Limited	39641	39641
16 September 2020	CIE/TANA/2020/D1086/ SPLX	M/s. Dev Systems	26040	26040
17 September 2020	CIE/ALAG/2020/D1088/ SPLX	M/s. USAM Technology	17955	17955
17 September 2020	CIE/5036/2020/D1089/ SPLX	M/s. Waters (India) Private Limited	128623	128623
18 September 2020	CIE/8834/2020/D1090/ SPLX	M/s. Dev Systems	81270	81270
18 September 2020	CIE/8253/2020/D1091/ SPLX	M/s. Dev Systems	81270	81270
27 August 2020	CIE/8251/2020/D1093/ SPLX	M/s. Caldi Pree Online Solution	26450	26450
22 September 2020	CIE/BALJ/2020/D1094/ SPLX	M/s. USAM Technology	14305	14305
22 September 2020	CIE/BALJ/2020/D1095/ SPLX	M/s. USAM Technology	22575	22575
22 September 2020	CIE/VBMA/2020/D1097/ SPLX	M/s. USAM Technology	26700	26700
24 September 2020	CIE/8952/2020/D1100/ SPLX	M/s. Dev Systems	65400	65400
30 September 2020	CIE/RADH/2020/D1107/ SPLX	M/s. Sri Balaji Enterprises	109200	109200
13 October 2020	CIE/5036/2020/D1116/ SPLX	M/s. Novateur Electrical and Digital Systems	24307	24307
15 October 2020	CIE/5036/2020/D1117/ SPLX	M/s. USAM Technology	15112	15112
16 October 2020	CIE/KOSH/2020/D1118/ SPLX	M/s. Sniper Systems and Solutions (P) Limited	182306	182306

16 October 2020	CIE/PALN/2020/D1123/ SPLX	M/s. USAM Technology	118258	118258
22 October 2020	CIE/5036/2020/D1127/ SPLX	M/s. Yes Square Marketing	132825	132825
23 October 2020	CIE/ALAG/2020/D1128/ SPLX	M/s. USAM Technology	63180	63180
27 October 2020	CIE/5036/2020/D1132/ SPLX	M/s. Space Techno Solutions	39980	39980
28 October 2020	CIE/5036/2020/D1133/ SPLX	M/s. Miclins India	60532	60532
5 November 2020	CIE/5036/2020/D1139/ SPLX	M/s. USAM Technology	48989	48989
5 November 2020	CIE/8310/2020/D1140/ SPLX	M/s. Hach DHR (I) Private Limited	54292	54292
6 November 2020	CIE/8893/2020/D1146/ SPLX	M/s. Elite Power Systems Private Limited	19650	19650
11 November 2020	CIE/8952/2020/D1149/ SPLX	M/s. Techno Seating System	67614	67614
12 November 2020	CIE/8175/2020/D1153/ SPLX	M/s. Mother Aircon & CO	47079	47079
13 November 2020	CIE/8160/2020/D1156/ SPLX	M/s. Lithesha Softwares	30500	30500
27 November 2020	CIE/BENN/2020/D1161/ SPLX	M/s. USAM Technology	176059	176059
1 December 2020	CIE/2804/2020/D1166/ SPLX	M/s. Ziptech Enterprises Private Limited	79998	79998
9 December 2020	CIE/8134/2020/D1174/ SPLX	M/s. Dev Systems	68670	68670
21 December 2020	CIE/BALJ/2020/D1178/ SPLX	M/s. USAM Technology	203700	203700
24 December 2020	CIE/2777/2020/D1183/ SPLX	M/s. USAM Technology	26402	26402
24 December 2020	CIE/2777/2020/D1184/ SPLX	M/s. Dev Systems	98490	98490

24 December 2020	CIE/INDU/2020/D1186/SPLX	M/s. Kovai Classic Industries	54863	54863
24 December 2020	CIE/INDU/2020/D1185/SPLX	M/s. ATR Solar	72963	72963
5 January 2021	CIE/8160/2020/D1196/SPLX	M/s. Lithesha Softwares	30500	30500
19 January 2021	CIE/8175/2020/D1206/SPLX	M/s. USAM Technology	60470	60470
22 January 2021	CIE/8100/2020/D1215/SPLX	M/s. Frontier Business system	49783	49783
25 January 2021	CIE/2777/2020/D1220/SPLX	M/s. Lithesha Softwares	30500	30500
29 January 2021	CIE/8566/2020/D1222/SPLX	M/s. Datalogics India Private Limited	169212	169212
1 February 21	CIE/5036/2020/D1225/SPLX	M/s. USAM Technology	43890	43890
4 February 21	CIE/SARU/2020/D1230/SPLX	M/s. Lithesha Softwares	30500	30500
2 February 21	CIE/SMOH/2020/D1231/SPLX	M/s. Sri Balaji Enterprises	62989	62989
8 February 21	CIE/8251/2020/D1236/SPLX	M/s. Mehta Scientific Corporation	103193	103193
16 February 21	CIE/8436/2020/D1257/SPLX	M/s. HTA Instrumentation Private Limited	13098	13098
1 March 2021	CIE/2797/2020/D1275/SPLX	M/s. Amazon	71999	71999
5 March 2021	CIE/8327/2020/D1283A/SPLX	M/s. Lithesha Softwares	30500	30500
5 March 2021	CIE/8930/2020/D1284/SPLX	M/s. Ziptech Enterprises Private Limited	31999	31999
15 March 2021	CIE/USAR/2020/D1298/SPLX	M/s. USAM Technology	132422	132422
18 March 2021	CIE/GARO/2020/D1310/SPLX	M/s. USAM Technology	59648	59648
<b>Total</b>			<b>142605280.00</b>	



**List of sponsored projects sanctioned during the financial year 2020 - 2021**

S No.	Project Number	Principal Investigator	Agency Name	Title	Start Date	Close Date	Sanction Value (in lakh)
1	CE19201054SERB008237	Saravanan U	Science and Engineering Research Board	Numerical technique to solve boundary value problems in solid mechanics	25 February 2020	24 February 2023	15.75
2	CE19201055SERB008190	Ravindra Gettu; Co-PI: Radhakrishna G Pillai	Science and Engineering Research Board	Study of the deterioration mechanisms in glass textile reinforced concrete and improvement of its durability	26 February 2020	25 February 2023	54.82
3	CE19201089IGST008190	Ravindra Gettu; Co-PI: Ligy Philip	Indo-German Science & Technology Centre	Modular lightweight wastewater treatment units made with TRC for rural and periurban dwellings (CleanWater)	9 March 2020	8 March 2023	84.77
4	CE19201122DSTX005036	Ligy Philip	Department of Science & Technology	Identifying best available technologies for decentralised wastewater treatment and resource recovery for India	11 March 2020	10 March 2024	164.53
5	CE1920155ISRO008502	Sachin S Gunthe; Co-PI: Rama Shanker Verma	Indian Space Research Organisation	Relation between pathogenic bio-aerosol and biotic stress of crop – a case study for yellow rust fungus of wheat	5 January 2019	30 April 2021	45.00
6	CE1920158SPAR008204	Indumathi M Nambi; Co-PI: Tiju Thomas	Scheme for Promotion of Academic and Research Collaboration	Circular economy in sanitation projects – NPK fertiliser, carbon recovery and water reuse	28 March 2019	27 March 2021	83.05
7	CE1920161SPAR008671	Mathava Kumar S; Co-PI: Raghuram Chetty	Scheme for Promotion of Academic and Research Collaboration	Biomass to energy from low strength municipal wastewater using a new microalgal-anaerobic-membrane-bioreactor(s)	30 April 2019	29 April 2021	49.51
8	CE1920204SPAR008100	Manu Santhanam; Co-PI: Ravindra Gettu	Scheme for Promotion of Academic and Research Collaboration	Towards durability specifications with recycled aggregate concrete	15 May 2019	14 May 2021	67.79
9	CE1920246MIMP008134	Karthik K Srinivasan; Co-PI: Lelitha Devi, Gitakrishnan Ramadurai	Impacting Research Innovation and Technology - Imprint	A connected intermediate public transport mobility-as-a-service (IPTMAAS) solution for the last mile connectivity and multi-model integration problems of public transit	26 March 2019	25 March 2022	54.53



S No.	Project Number	Principal Investigator	Agency Name	Title	Start Date	Close Date	Sanction Value (in lakh)
10	CE1920291SPAR002786	Mohan S	Scheme for Promotion of Academic and Research Collaboration	Bioremediation of urban sites contaminated due to municipal wastewater disposal	25 June 2019	24 June 2021	21.06
11	CE1920292MEIT000167	Sivanandan R; Co-PI: Karthik K Srinivasan	Ministry of Electronics and Information Technology	Promoting road safety through deployment of driver assistance and warning systems	28 June 2019	27 June 2021	58.06
12	CE1920331MEIT008253	Lelitha Devi; Co-PI: Bhargava Rama Chilukuri	Ministry of Electronics and Information Technology	Development of a bus priority system at signalized intersections using V2I communication	28 June 2019	27 June 2021	65.73
13	CE1920332SPAR008459	Radhakrishna G Pillai; Co-PI: Manu Santhanam	Scheme for Promotion of Academic and Research Collaboration	Enhancing the durability and sustainability of concrete structures in emerging economics	11 July 2019	10 July 2021	71.28
14	CE1920355DSTX008190	Ravindra Gettu; Co-PI: Piyush Chaunsali, Surender Singh	Department of Science and Technology	A new framework of high value added zero-waste recycling of concrete from construction and demolition waste	26 July 2019	25 July 2021	33.86
15	CE1920369MEIT008834	Bhargava Rama Chilukuri; Co-PI: Lelitha Devi	Ministry of Electronics and Information Technology	Departure time planner using V2V and V2I communication	28 June 2019	27 June 2021	81.10
16	CE1920374MEIT008134	Karthik K Srinivasan; Co-PI: Sivanandan R, Gitakrishnan Ramadurai	Ministry of Electronics and Information Technology	Data-driven models and decision support tools for improved transit reliability in Indian cities	28 June 2019	27 December 2021	83.49
17	CE1920389NDMA008318	Murty C V R	National Disaster Management Authority	Illustrated homeowners guide for earthquake and cyclone safety	25 June 2019	30 October 2019	3.67
18	CE1920425SPAR008121	Sudheer K P	Scheme for Promotion of Academic and Research Collaboration	Enhancing the water use efficiency in agriculture practices in Himalayan region	8 August 2019	7 August 2021	43.84
19	CE1920577NDMA008321	Rupen Goswami	National Disaster Management Authority	Draft of Indian standard code of practice for seismic design and detailing of steel structures	3 September 2019	2 September 2020	6.54

S No.	Project Number	Principal Investigator	Agency Name	Title	Start Date	Close Date	Sanction Value (in lakh)
20	CE1920579NRRD008165	Veeraragavan A	National Rural Road Development Agency	Lifecycle and performance assessment of waste plastic roads	16 September 2019	15 March 2021	9.60
21	CE1920580NRRD008165	Veeraragavan A	National Rural Road Development Agency	Lifecycle and performance assessment of cold mix roads	16 September 2019	15 March 2021	9.60
22	CE1920621SERB008876	Lakshmi Subramanian	Science and Engineering Research Board	Moment-shear interaction of unstiffened steel I-sections subject to lateral torsional buckling	1 October 2019	17 March 2022	47.02
23	CE1920633IUSS008204	Indumathi Manivannan Nambi	Indo-US Science and Technology Forum	An integrated-modular-onsite urine treatment unit for the recovery of green fertilizers and water	20 September 2019	19 September 2020	11.00
24	CE1920751SERB008893	Alagappan Ponnalagu	Science and Engineering Research Board	A study of blast wave impact on helmet-head assembly to mitigate traumatic brain injury	26 November 2019	25 November 2021	29.44
25	CE1920785SERB008121	Sudheer K P	Science and Engineering Research Board	Faculty travel under first edition of SERB Purdue University Overseas Visiting Doctoral Fellowship	1 December 2019	17 December 2019	3.91
26	CE1920817SERB008941	Phanisri Pradeep Pratapa	Science and Engineering Research Board	Designing Origami-based metamaterials with low frequency elastic bandgaps	14 December 2019	13 December 2021	32.54
27	CE1920870UKRI008251	Shiva Nagendra S M	UK Research and Innovation	GCRF Clean Environment and Planetary Health in Asia (CEPHA) Network	20 September 2019	19 September 2021	141.12
28	CE1920935MOES008204	Indumathi Manivannan Nambi	Ministry of Earth Sciences, New Delhi	Marine litter and microplastic	23 January 2020	22 January 2021	26.10
29	CE1920987MIMP008204	Indumathi Manivannan Nambi; Co-PI: Tiju Thomas	Impacting Research Innovation and Technology - IMPRINT	Sanitation in the circular economy - an integrative-modular-onsite toilet treatment for NPK fertilizer, carbon and water	22 January 2020	21 January 2022	69.07

## List of sponsored projects sanctioned during the financial year 2020 - 2021

S No.	Project Number	Principal Investigator	Agency Name	Title	Start Date	Close Date	Sanction Value (in lakh)
1	CE2021050MEIT008566	Soumendra Nath Kuiry; Co-PI: Murty B S, Balaji Narasimhan	Ministry of Electronics and Information Technology	Urban modelling: development of multi-sectorial simulation lab and science-based decision support framework to address urban environment issues	27 June 2019	26 June 2023	40.00
2	CE2021057SHAS008671	Mathava Kumar S	Shastri Indo-Canadian Institute	Development of novel water and wastewater treatment technologies	27 April 2020	26 April 2022	10.00
3	SP20210536CEIGST008204	Indumathi Manivannan Nambi	Indo-German Science and Technology Centre	Effect-based monitoring demonstrates efficiency of electrically driven water treatment processes to remove salts and micropollutants from process water (EfectroH2O)	21 October 2020	20 October 2023	140.01
4	SP20210568CESERB008953	Ramesh Kannan Kandasami	Science and Engineering Research Board	A critical understanding on the mechanics of gas hydrate sediments for sustainable long term energy extraction	24 November 2020	23 November 2022	33.00
5	SP20210632CEDBTX008566	Soumendra Nath Kuiry; Co-PI: Indumathi Manivannan Nambi, Balaji Narasimhan	Department of Biotechnology	AMRFlows: Antimicrobials and resistance from manufacturing flows to people: joined up experiments, mathematical modelling and risk analysis	11 December 2020	10 December 2023	104.20
6	SP20210588CESERB008961	Chandan Sarangi	Science and Engineering Research Board	Process level understanding of aerosol-fog-urbanization coupling over IGP	3 December 2020	2 December 2022	32.92
7	SP20211000CESERB008310	Balaji Narasimhan	Science and Engineering Research Board	Integrating hydrology and agriculture with livelihood issues: development of climate change adaptation approaches for sustainable water management in humid tropical Kerala	1 April 2021	31 March 2024	5.50
8	SP20210974CENRSC008310	Balaji Narasimhan	National Remote Sensing Centre	Development of web-enabled hydrologic modelling in SWAT (WEHMS) under National Hydrology Project	11 March 2021	31 March 2024	64.68

## List of consultancy projects sanctioned during the financial year 2020-2021

S. No.	Type	Project Number	Principal Investigator	Agency Name	Title	Start Date	Close Date
1	IC	IC1920CE043BHEL008335	Thyagaraj T; Co-PI: Subhadeep Banerjee	Bharat Heavy Electricals Limited	Vetting of rectification measures for TG foundation of Unit #1 for Ennore SEZ 2X 660MW	4 January 2019	31 October 2019
2	IC	IC1920CE045SKIL005034	Alagusundaramoorthy P	Skilled Construction Company Limited	Review of structural design and drawing of 45 M composite girder for Konkan Railway	4 January 2019	30 June 2019
3	IC	IC1920CE046UTRA005034	Alagusundaramoorthy P	Utracon Structural System Private Limited	Review of the design of post-tensioned beams in the Lecture Hall and Seminar Hall at IIT Indore campus	4 January 2019	30 June 2019
4	IC	IC1920CE047AABS005034	Alagusundaramoorthy P	Adyar Ananda Bhavan Sweets India Private Limited	Review of the analysis and design of the foundation and super structure of the proposed food plaza at Central Railway Station, Chennai	4 January 2019	30 June 2019
5	RB	RB1920CE117WEBD008588	Benny Raphael	WebDatacast L.l.c	State of art of sunshade protection for residences and public spaces	5 January 2019	31 December 2020
6	RB	RB1920CE017OOZE008310	Balaji Narasimhan; Co-PI: Indumathi M Nambi	Ooze Architects	"Water as leverage" (Chennai) - City of 1000 tanks	4 May 2019	31 December 2020
7	IC	IC1920CE031AXLE002776	Meher Prasad A	Axles India Limited	Testing of commercial axle housing	4 May 2019	31 October 2019
8	IC	IC1920CE035AAAA005002	Satish Kumar S R	Common Code	Proof checking of structural design	4 May 2019	4 April 2022
9	IC	IC1920CE037LNTL005003	Devdas Menon; Co-PI: Arul Jayachandran S	Larsen & Toubro Limited	Proof checking and approval of design and drawings of substructure and superstructure for rail flyovers (RFOs) and road over bridges (ROBs) for the project, Western Dedicated Freight Corridor Package-3R (Iqbalgarh-Vadodara Section)	4 September 2019	30 April 2020
10	IC	IC1920CE038LNTL005003	Devdas Menon	L&T Infrastructure Engineering Limited	Proof checking of the designs and drawings of substructure and foundation for railway grade separator, Katni Project	4 September 2019	30 April 2020
11	IC	IC1920CE114TSCB002777	Boominathan A	Tamilnadu Slum Clearance Board	Geotechnical investigation for reconstruction of slum tenements at Vyasarpadi Old Block, Corp. Divn: 46	4 October 2019	31 March 2020

12	IC	IC1920CE113DLLX005003	Devdas Menon	Directorate of Lighthouses and Lightships	Establishment of new lighthouse at Dhanushkodi -architectural and structural design of RCC lighthouse tower of 45m height	4 December 2019	31 October 2019
13	IC	IC1920CE030LRHC008111	Appa Rao G	Lakshmi Royal Home Constructions	Proof checking of post-tensioned beams in an apartment at Vanagaram	15 March 2019	13 June 2019
14	IC	IC1920CE036SSIC008459	Radhakrishna G Pillai	S S Infrastructure Development Consultants Limited	Condition assessment of reinforced concrete systems in port facilities	15 April 2019	15 October 2019
15	IC	IC1920CE115TNGD008335	Thyagaraj T; Co-PI: Robinson R G	Tamil Nadu Generation and Distribution Corporation Limited	Consultancy services for the rehabilitation and raising of ash dyke at Ennore SEZ STPP	15 April 2019	4 September 2020
16	IC	IC1920CE116AMCS005036	Ligy Philip; Co-PI: Sreenivasa Murthy B	AM Corporate Social Responsibility Foundation	Identification of reliable source for drinking water supply and designing of conveyance systems in Vilangadupakkam	22 April 2019	30 April 2020
17	IC	IC1920CE105EKKI005003	Devdas Menon	EKK Infrastructure Limited	Proof checking of four-laning of Thalassery-Mahe Bypass Section of NH-17 (new NH-66) from Km 170.600 (design Ch Km 170.600) to Km 188.000 (design Ch Km 189.200) under NHDP Phase- on EPC mode III, Kerala	23 April 2019	30 September 2019
18	IC	IC1920CE048URCC005034	Alagusundaramoorthy P	URC Construction Private Limited	Analyzing and testing of materials for the construction of major bridges, RCC box bridges and pre-cast RCC box segments in Madurai Division of Southern Railway	24 April 2019	23 April 2020
19	IC	IC1920CE011SNSI008169	Nageswara Rao B	SNS Infracon Private Limited	Proof checking and vetting of structural design of upcoming boys' hostel (15280 sqm) at Bhubaneswar, Odisha	25 March 2019	24 March 2020
20	IC	IC1920CE103AFCO008169	Nageswara Rao B	Afcons Infrastructure Limited	Design qualification test for railway concrete sleeper - construction of single standard gauge railway line from Tema to Akosombo on engineering, procurement and construction (EPC) basis, Ghana	26 April 2019	25 April 2020

21	IC	IC1920CE015VGTMM002776	Meher Prasad A	VGTM Urban Development Authority	Proof checking for the structural designs and drawings of Amaravati Happy Nest Project	29 March 2019	31 December 2019
22	IC	IC1920CE102HYUD008251	Shiva Nagendra S M	Hyundai Motor India Limited	Conducting environmental compliance audit	30 March 2019	30 August 2019
23	IC	IC1920CE014ULCL005003	Devdas Menon	Ultratech Cement Limited	Dynamic load test for Ultratech Power Grout	30 March 2019	30 September 2019
24	IC	IC1920CE012PCPR008347	Dali Naidu Arnepalli	P&C Projects	Design and proof checking of RE wall for ROB between Ambattur and Avadi Railway Stations near Annanur Railway Station	31 March 2019	31 March 2020
25	IC	IC1920CE123LNTL008204	Indumathi M Nambi	Larsen & Toubro Limited	Proof checking of storm water drain at Patna Smart City	5 January 2019	30 April 2020
26	IC	IC1920CE112LNTN002776	Meher Prasad A	L&T Infrastructure Engineering Limited	Proof checking of seven bridges in APCRDA Zone 4	5 January 2019	31 October 2019
27	IC	IC1920CE096BRID005002	Satish Kumar S R	Bridge & Roof Co., (India) Limited	Proof checking structural design of MUC and PGH at Sishu Bhawan, Cuttack	5 January 2019	31 December 2019
28	IC	IC1920CE134TNHB005034	Alagusundaramoorthy P	Tamil Nadu Housing Board	Review of analysis and design and vetting of drawings for construction TNGRHS flats at Saidapet for Tamil Nadu Housing Board	5 January 2019	30 April 2020
29	RB	RB1920CE148TSCB005034	Alagusundaramoorthy P	Tamilnadu Slum Clearance Board	Soil investigation and analysis and design of multi-storey buildings for TNSCB at Chennai	5 January 2019	31 May 2021
30	IC	IC1920CE146TURI008111	Appa Rao G	Turbo Industries Private Limited	Testing of scaffolding towers for capacity requirement	5 January 2019	31 July 2019
31	IC	IC1920CE140KELL008160	Robinson R G; Co-PI: Subhadeep Banerjee	Keller Ground Engineering India Private Limited	Proof checking the geotechnical design for ground improvement works using stone, IOCL Refinery, Paradip, Odisha	6 January 2019	31 March 2020
32	IC	IC1920CE111LTCW008554	Venu Chandra	L&T Construction, Water & Effluent Treatment IC	Vetting and approval of rural piped water supply projects pertaining to mining affected villages of Mayurbhanj district, Odisha	5 February 2019	31 December 2020
33	IC	IC1920CE110LTCW008554	Venu Chandra	L&T Construction, Water & Effluent Treatment IC	Vetting and approval of rural piped water supply projects pertaining to mining affected villages of Keonjhar district, Odisha	5 February 2019	31 December 2020

34	IC	IC1920CE118LNTL002776	Meher Prasad A	Larsen & Toubro Limited	Proof checking of major bridges, drains and structural units of STP with intermediate pumping stations for Amaravati Capital City- Zone 6	5 March 2019	30 November 2019
35	IC	IC1920CE121RAIL005003	Devdas Menon	Rail Vikas Nigam Limited	Proof checking of foundation and sub-structural design calculations for abutments and piers-15 nos	5 September 2019	31 December 2019
36	IC	IC1920CE120KNRC005003	Devdas Menon	KNR Construction Limited	Proof checking of construction of six-laning of NH-140 from Chittoor (design Km.0.000/existing Km.158.000 of NH-4) to Mallavarm (design Km.61.128/existing Km.41.800 of NH-140) in AP under Bharatmala Pariyojana on hybrid annuity mode	5 September 2019	30 November 2019
37	IC	IC1920CE124RDSP008169	Nageswara Rao B	RDS Project Limited	Checking and vetting of structural design and drawings including foundation of proposed construction of new four-lane with elevated highway including approaches and service roads connecting Kazhakoottam Jn. and Technopark Jn. of NH-47 in Kerala	5 September 2019	5 August 2020
38	IC	IC1920CE119SBSA008111	Appa Rao G	SBS Associates	Design and verification of underpass in national highway between Tuticorin and Tirunelveli	4 October 2019	30 September 2019
39	IC	IC1920CE133URCC005002	Satish Kumar S R	URC Construction Private Limited	NBCC-SAIL Project at Rourkela	17 May 2019	31 December 2019
40	IC	IC1920CE142TNHB002776	Meher Prasad A	Tamil Nadu Housing Board	Proof checking of structural designs of 114 super high flats (stilt+19 floors) under self-finance scheme at SAF Games Village, Koyambedu, Chennai	18 May 2019	18 May 2020

41	IC	IC1920CE143LNTN002776	Meher Prasad A	L&T Construction, Buildings and Factories	Proof checking vetting of structural design and drawings for proposed construction of physical and social infra facilities for EWS housing for selected UIB's in Krishna and Prakasham for West Godavari district, Andhra Pradesh	22 May 2019	30 November 2019
42	IC	IC1920CE144FLSL005002	Satish Kumar S R	FLSmith Private Limited	Proof checking of railway crossing gallery at Joda East	22 May 2019	31 December 2019
43	IC	IC1920CE145PENN005002	Satish Kumar S R	Pennar Engineering Building Systems Limited	Proof checking design of PEBs	22 May 2019	31 December 2019
44	IC	IC1920CE099LNTL008204	Indumathi M Nambi	Larsen & Toubro Limited	Vetting of water treatment plant in Mayurbhanj, Odisha	24 April 2019	23 March 2020
45	IC	IC1920CE098LNTL008204	Indumathi M Nambi	Larsen & Toubro Limited	Vetting of water treatment plant in Boudh, Odisha	24 April 2019	23 March 2020
46	IC	IC1920CE100KCPE005003	Devdas Menon	KCP Engineers Private Limited	Construction of multi-level car parking project at DB Road, Coimbatore	26 April 2019	28 February 2021
47	IC	IC1920CE095LNTL005003	Devdas Menon	Larsen & Toubro Limited	Testing of modular scaffold tower system	30 April 2019	31 October 2019
48	IC	IC1920CE227LNTL002804	Rajagopal K	Larsen & Toubro Limited	Geotechnical consultancy services for Western Dedicate Freight Corridor	6 January 2019	31 May 2020
49	RB	RB1920CE199PATR008100	Manu Santhanam	Patil Rail Infrastructure Private Limited	Evaluation of delayed ettringite formation in concrete sleepers	6 January 2019	31 May 2020
50	IC	IC1920CE225PSGP008111	Appa Rao G	PS Group Realty Private Limited	Design and verification of drawings of G+8 office building at Kolkata (typical floor only)	6 March 2019	31 August 2019
51	IC	IC1920CE229VIVO008111	Appa Rao G	Vivo Mobile India Private Limited	Vetting of designs and drawing, details and analysis of industrial building at YEIDA, Greater Noida	6 March 2019	30 June 2020
52	IC	IC1920CE197NLCI008169	Nageswara Rao B	NLC India Limited	Checking and vetting of structural design and drawings of new arch gate for NLCIL Entrance at Neyveli	6 April 2019	4 March 2020
53	IC	IC1920CE196ECOX008169	Nageswara Rao B	Eco Chimneys Private Limited	Checking and vetting structural design and drawings of proposed construction of 61m chimney for MRF Tyres, Dahej	6 May 2019	6 April 2020



54	IC	IC1920CE257CMKP005034	Alagusundaramoorthy P	CMK Projects Private Limited	Review of the analysis and design of Tamilnadu Slum Clearance Board Type A Building at Moolakothalam in Chennai	6 June 2019	6 May 2020
55	IC	IC1920CE180EKKI005003	Devdas Menon	EKK Infrastructure Limited	Proof checking of four laning of Thalassery-Mahe Bypass Section of NH-17 (new NH-66) from Km 170.600 (design Ch Km 170.600) To Km 188.000 (design Ch Km 189.200) under NHDP Phase-on EPC Mode III in Kerala	6 June 2019	31 December 2019
56	IC	IC1920CE183GETD005034	Alagusundaramoorthy P	GE T&D India Limited	Review of the analysis and vetting of the design calculations of support structure and platform for circuit breakers	6 June 2019	6 May 2020
57	IC	IC1920CE184URCC002776	Meher Prasad A	URC Construction Private Limited	Proof checking of the structural De of new BMC Corporation Building including the Intelligent City Operations and Management Centre (ICOMC) at Unit IX, Bhubaneswar, Odisha	6 June 2019	29 May 2020
58	IC	IC1920CE194TSCB002777	Boominathan A	Tamilnadu Slum Clearance Board	Geotechnical studies for construction of 3024 tenements of various scheme storyed RCC framed structures at Mappedu, Pakkam A and B project schemes in Thiruvallur district (Tamil Nadu)	5 October 2019	31 March 2020
59	RB	RB1920CE259APPC008251	Shiva Nagendra S M	Andhra Pradesh Pollution Control Board	Carrying capacity assessment of stone quarrying mines at Perecherla, Guntur	6 October 2019	31 October 2019
60	IC	IC1920CE176LTCN008436	Arul Jayachandran S; Co-PI: Alagappan P	L&T Construction	Full-scale load test of the sky bridge at L&T fabrication shop at Kanchipuram	6 October 2019	7 August 2019
61	IC	IC1920CE219TTP0005034	Alagusundaramoorthy P	Tamil Nadu Trade Promotion Organisation	Review of the structural design and vet the drawings for construction towards the expansion of existing Chennai Trade Centre Campus in Chennai	6 October 2019	6 November 2020
62	IC	IC1920CE221FDCM008169	Nageswara Rao B	Freyssinet Dynamic Consortium	Fatigue test on dynamic prestress anchorage system for epoxy coated strands	6 October 2019	6 September 2020

63	RB	RB1920CE217SGIP008100	Manu Santhanam	Saint-Gobain India Private Limited	Comfort studies on lime plaster	17 June 2019	31 December 2019
64	IC	IC1920CE220SSIC008169	Nageswara Rao B	SS Infrastructure Development Consultants Limited	Vetting of the report, Study of condition assessment of strength of reinforced concrete jetty deck beams/slabs supporting Ell cranes, MYU Department	18 June 2019	6 September 2020
65	IC	IC1920CE237AAAA005036	Ligy Philip	Common Code	Water, wastewater and soil sample analysis	20 June 2019	19 June 2022
66	IC	IC1920CE235TPLT005036	Ligy Philip	Tata Projects Limited	Study on pollution abatement process of Budha Nallah, Ludhiana	20 June 2019	19 December 2019
67	IC	IC1920CE280KELL008478	Subhadeep Banerjee; Co-PI: Robinson R G	Keller Ground Engineering India Private Limited	Vetting of pile foundation design at HPCL refinery, Vizag	28 June 2019	1 October 2019
68	IC	IC1920CE265DDFC005036	Ligy Philip	DDF Consultants Private Limited	Proof checking of plant design of STP and WTP in IIT Palakkad	16 June 2019	15 December 2019
69	IC	IC1920CE317TPLT005002	Sathish Kumar S R	Tata Projects Limited	Proof checking of hospital building at Keonjhar	17 July 2019	17 March 2020
70	IC	IC1920CE335LTHL008478	Subhadeep Banerjee; Co-PI: Boominathan A	L&T Hydrocarbon Engineering Limited	Recommendation for the tank foundation - HRRL, Rajasthan	23 July 2019	30 November 2019
71	IC	IC1920CE327LTCW008111	Apparao G	L&T Construction Water & Effluent Treatment IC	Proof checking and approval of structural and civil design and drawing for Patna Smart City Project	1 July 2019	31 May 2020
72	IC	IC1920CE328STEW008190	Ravindra Gettu	Stewols India Private Limited	Testing of Shaktiman fibres for use in concrete tunnel linings	21 July 2019	30 September 2019
73	IC	IC1920CE318TPLT005002	Sathish Kumar S R	Tata Projects Limited	Proof checking of Bhavanipatna Medical College buildings	18 July 2019	18 March 2020
74	IC	IC1920CE305RAIL005003	Devdas Menon	Rail Vikas Nigam Limited	Proof checking of tripling with electrification of railway line between Gudur-Krishna Canal stations in Vijayawada Division of South Central Railway	11 July 2019	31 January 2020
75	IC	IC1920CE306RAIL005003	Devdas Menon	Rail Vikas Nigam Limited	Proof checking of tripling with electrification of railway line between Gudur Krishna Canal stations in Vijayawada Division of South Central Railway	11 July 2019	31 January 2020

76	IC	IC1920CE299LNTG002777	Boominathan A; Co-PI: Subhadeep Banerjee	L&T Geostructure LLP	Proof checking of stone column design for tank foundations at BPCL Krishnapatinam project site	12 July 2019	12 December 2019
77	IC	IC1920CE287LNTL005003	Devdas Menon	Larsen & Toubro Limited	Proof checking of construction of ROB between L-xing no.29 and 30 at Railway km 37/3-4 on Delhi-Rewari Section near Basai Dhankot Station	2 July 2019	31 January 2020
78	IC	IC1920CE288KMCH005003	Devdas Menon; Co-PI: Meher Prasad A	Kovai Medical Center and Hospital Limited	Proof checking of structural designs and drawings for Medical College Hospital Building (Block A&B) Hostel Block and Residential quarters	5 July 2019	30 June 2020
79	IC	IC1920CE289BIAL005003	Devdas Menon	Bangalore International Airport Limited	Proof checking of two railway ROBs proposed with the Trumpet expansion works which is a major upgradation work of Main Access Road leading to KIA, Bangalore	5 July 2019	31 January 2020
80	IC	IC1920CE340ARIP005036	Ligy Philip	Aurobindo Realty & Infrastructure Private Limited	Vetting the design for pipe reactor system of Galaxy Towers	17 July 2019	16 January 2020
81	IC	IC1920CE344RKCP008169	Nageswara Rao B	R Karunanidhe Constructions Private Limited	Checking and vetting of structural design and drawings including foundation of three PEB buildings at KR Pet, Karnataka, with 1,00,000, 50,000 and 20,000 sq.ft. construction area	25 July 2019	24 July 2020
82	IC	IC1920CE358GCE005036	Ligy Philip	Gangapuram Common Effluent Treatment Plant Private Limited	Detailed Project Report for ZLD for Gangapuram Common Effluent Treatment Plant Private Limited	26 July 2019	31 January 2020
83	IC	IC1920CE359NNE008321	Rupen Goswami	NNE Limited	Displacement-based seismic safety assessment of RC building blocks	25 July 2019	31 July 2020
84	IC	IC1920CE361SRSA008169	Nageswara Rao B	Sri Ram Samaj	Stability analysis of the reinforced concrete structures of the Sitaram Vidyalaya Matriculation Higher Secondary School Buildings of M/s Sri Ram Samaj, Chennai	24 July 2019	23 July 2020
85	IC	IC1920CE366SKIP008436	Arul Jayachandran S	Skipper Limited	Design checking of steel transmission line monopoles	30 July 2019	9 August 2019

86	IC	IC1920CE367LTCW008554	Venu Chandra	L&T Construction Water & Effluent Treatment Ic	Vetting and approval of mechanical drawings and documents pertaining to execution of rural water supply projects to Boudh district, Odisha	29 July 2019	31 December 2020
87	IC	IC1920CE277PERW008436	Arul Jayachandran S	PERI Werk (India) Private Limited	Experimental testing of aluminum panels for PERI, Pune	27 June 2019	4 July 2019
88	IC	IC1920CE274SHPS005002	Sathish Kumar S R	Seven Hills PEB Systems Private Limited	Proof checking of PEB design for Alstom at Sricity	28 June 2019	31 December 2019
89	IC	IC1920CE275VGSPO05002	Sathish Kumar S R	Volta Green Structures Private Limited	Proof checking of PEB design for GE Diesel Loco	27 June 2019	31 December 2019
90	IC	IC1920CE261RDSPO08169	Nageswara Rao B	RDS Project Limited	Checking and vetting of structural design and drawings including foundation - proposed construction of two lane with paved shoulders Alappuzha Bypass from Km 408+100 to Km 414+900 on NH-47 in Kerala	24 June 2019	23 July 2020
91	RB	RB1920CE264SAIO005036	Ligy Philip	Saint-Gobain Research India Limited	Water filtration performance of Saint-Gobain ceramic filters	25 June 2019	30 June 2020
92	IC	IC1920CE268MIMS002777	Boominathan A; Co-PI: Subhadeep Banerjee	McDermott International Management S. DE.RL	Site-specific seismic study for the KG-DWN-SPS+SURF Project, Eastern Offshore, India	24 June 2019	23 December 2019
93	IC	IC1920CE283LTCH008554	Venu Chandra; Co-PI: Murty B S	L&T Construction Heavy Civil Infrastructure	Proof checking of hydrology report prepared for the construction of six-lanes iconic bridge between Pavithra Sangamam and N10 Road, Amaravati, Andhra Pradesh	6 July 2019	31 December 2020
94	IC	IC1920CE279NCCI005034	Alagusundaramoorthy P	NCC Limited	Analyzing and testing elastomeric bearing pads for bridge applications	27 June 2019	31 December 2019
95	RB	RB1920CE270NLCI008251	Shiva Nagendra S M; Co-PI: Srirama Srinivas	NLC India Limited	Development of mobile EV based - real time air quality monitoring and modeling for NLCIL	26 June 2019	25 June 2022
96	IC	IC1920CE407KRIE008111	Apparao G	M/s Krishi Infratech	Vetting of structural designs and drawings of two-lane ROB	1 August 2019	31 October 2019

97	IC	IC1920CE404GEOR008111	Apparao G	M/s. Geostructural Private Limited	Proof checking of designs and drawings of multi-storey building, Aryabhangy Rhinestone Apartment Project	1 August 2019	30 November 2019
98	IC	IC1920CE412RCCP002777	Boominathan A	Ramalingam Construction Company (P) Limited	Construction of three high rise (S+19 floors) buildings for TNHB at Thodhunter Nagar site (Chennai) - Geotechnical Investigation	14 August 2019	31 March 2020
99	IC	IC1920CE377VASA008321	Rupen Goswami; Co-PI: Amlan K Sengupta	Vastunidhi	Proof checking of buildings in residential zone of permanent campus of IIT Palakkad	26 July 2019	31 July 2020
100	IC	IC1920CE392EPMC005002	Sathish Kumar S R	Engineering Project Management Consultancy and Research Private Limited	Proof checking of RCC wall design and drawings for TNCSC Godowns at Kovilpathu, Nagapattinam	2 August 2019	2 March 2020
101	IC	IC1920CE391LTCW008478	Subhadeep Banerjee; Co-PI: Boominathan A	Larsen & Toubro Limited Construction Water and Effluent Treatment IC	Analysis of deep excavation for Greater Colombo Waste Water Project	2 August 2019	31 August 2020
102	IC	IC1920CE402URCC002776	Meher Prasad A	URC Construction Private Limited	Proof checking for design and construction of four- lane grade separator of an approximate length 1 km and two road over bridges (ROB) over the existing railway line, vehicular under pass (VUP) and road bridge across NH 44	1 August 2019	29 January 2020
103	IC	IC1920CE410CETP005036	Ligy Philip	Green Kalingarayan Common Effluent Treatment Plant Private Limited	Detailed Project Report for ZLD for Green Kalingarayan Common Effluent Treatment Plant Private Limited	5 August 2019	4 February 2020
104	IC	IC1920CE413TIBP008671	Mathava Kumar S	Ticel Bio Park Limited	Evaluation of the performance of STP and ETP in TICEL Bio Park Limited, Chennai	7 August 2019	7 February 2020
105	IC	IC1920CE416MPEZ008169	Nageswara Rao B	Madras Export Processing Zone	Assessment of the structural strength of the building for the proposed construction of additional floor, viz 3rd floor in the Administrative Building of M/s Madras Export Processing Zone (MPEZ) at Tambaram, Chennai	2 August 2019	31 July 2020

106	IC	IC1920CE420UTRA005003	Devdas Menon	Utracon Structural Systems Private Limited	Proof checking of post tensioned design and details for Biogas Plant at Chandigarh	13 August 2019	31 July 2020
107	IC	IC1920CE419AHPL008169	Nageswara Rao B	Anjali Hotels Private limited	Proof checking and vetting of design and drawing of Food Plaza at Chennai Railway Station (MMC)	1 August 2019	31 July 2020
108	IC	IC1920CE429KRFB008169	Nageswara Rao B	Kerala Road Fund Board	Inspection of the project and verification of the structural design and carrying out if any additional tests required for ensuring the structural stability of six-lane flyover at Vyttila (Km 348/380 of NH47)	13 August 2019	12 August 2020
109	IC	IC1920CE432AACL008111	Apparao G	AECOM Asia Company Limited	Verification of safety of elastomeric bearings, testing, site visit and recommendations	1 August 2019	31 December 2019
110	IC	IC1920CE433SCET005036	Ligy Philip	Suriyampalayam Common Effluent Treatment Plant Private Limited	Detailed Project Report for ZLD for Suriyampalayam CETP	9 August 2019	08 February 2020
111	IC	IC1920CE434VILL005036	Ligy Philip	Villarasampatti Common Effluent Treatment Plant	Detailed Project Report for ZLD for Villarasampatti CETP	8 August 2019	07 February 2020
112	IC	IC1920CE439MICL002786	Mohan S	Micro Labs Limited	Environmental audit	1 August 2019	30 April 2020
113	IC	IC1920CE447SIEY005002	Sathish Kumar S R	Sieyuan Electric (India) Private Limited	Proof checking of PEB for GIS factory at Sricity	21 August 2019	31 March 2020
114	IC	IC1920CE448ROAS008169	Nageswara Rao B	Roads and Bridges Development Corporation of Kerala Limited	Inspection of the project and verification of the structural design and carrying out if any additional tests required for ensuring the structural stability of Kundannoor Flyover	13 August 2019	12 August 2020
115	IC	IC1920CE449SSIP005002	Sathish Kumar S R	Smith Structures India Private Limited	Proof checking of PEB for Hamilton Housewares at Sricity	20 August 2019	31 March 2020
116	IC	IC1920CE453LLPX002776	Meher Prasad A	Lansum Properties LLP	Proof checking of Lansum Square MVP Colony, Vizag	19 August 2019	18 August 2020
117	RB	RB1920CE428RRIC008347	Dali Naidu Arnepalli	RR Infraa Construction	Design and proof checking of RE walls for construction of flyover at Kandanampatti Junction, Tiruchengode Ariyanur Road, Eddapady Road Reg.	13 August 2019	13 August 2020

118	RB	RB1920CE456SOUT008588	Benny Raphael; Co-PIs: Rupen Goswami, Arun Menon, Radhakrishna G Pillai	Southern Railways	Condition assessment of railway bridges	26 August 2019	25 August 2021
119	RB	RB1920CE455GTFL008347	Dali Naidu Arnepalli	Garware Technical Fibres Limited	Design of phosphogypsum stack at Greenstar Limited (SPIC)-Tuticorin Reg.	1 August 2019	24 May 2020
120	RB	RB1920CE465NDMA008344	Raghukanth S T G	National Disaster Management Authority	Probabilistic seismic hazard map of India	16 August 2019	16 August 2020
121	IC	IC1920CE472LTCW008554	Venu Chandra	Larsen & Toubro Limited Construction Water and Effluent Treatment IC	Proof checking and approval of network design and drawing for Ranchi Smart City, Jharkhand	1 September 2019	31 December 2020
122	IC	IC1920CE539BHEL008478	Subhadeep Banerjee	Bharat Heavy Electricals Limited - Industrial Systems Group	Design and assessment of ground improvement in the coal stock pile area for 2X660 MW TANGEDCO, Ennore STPP	25 September 2019	01 October 2020
123	IC	IC1920CE534SIOT008111	Apparao G	Sical Iron Ore Terminals Limited	Structural stability certification for wagon loading system for modification of rail siding at SIOTL Site, Kamarajar Port	7 September 2019	31 December 2019
124	IC	IC1920CE540BRIG005003	Devdas Menon	Bridges Department	Preparation feasibility report and Detailed Project Report (DPR) for widening of bridge across Coom at Arunachala Road	25 September 2019	31 March 2020
125	RB	RB1920CE535PCPR008347	Dali Naidu Arnepalli; Co-PIs: Shankar Krishnapillai, Parag Ravindran	P&C Projects Private Limited	Design and proof checking of RE walls for construction of grade separator at the intersection of Mount -Medavakkam Road and Pallavaram-Thuraipakkam Road, near Kilkattalai Reg.	19 September 2019	18 September 2020
126	IC	IC1920CE536APCP005002	Sathish Kumar S R	Arch Project Consultants Private Limited	Proof checking of shed for TPI composites at Aarush Logistic Park Chennai	24 September 2019	24 March 2020
127	IC	IC1920CE537SSIC002776	Meher Prasad A	SS Infrastructure Development Consultants Limited	Proof checking of structural designs for BEL factory at Machlipatanam	25 September 2019	20 September 2020
128	IC	IC1920CE538EPMC008321	Rupen Goswami	Engineering Project Management Consultancy and Research Private Limited	Peer review of structural design of depot and station buildings of MLRT	10 September 2019	30 April 2020

129	IC	IC1920CE511KETP005036	Ligy Philip	Kadayampatti Common Effluent Treatment Plant (Bhavani) Private Limited	Detailed Project Report for ZLD for proposed textile Common Reject Management Systems Private Limited (CRMS)	13 September 2019	12 March 2020
130	IC	IC1920CE512KETP005036	Ligy Philip	Kadayampatti Common Effluent Treatment Plant (Bhavani) Private Limited	Detailed Project Report for ZLD for proposed Kadayampatti CETP	13 September 2019	12 March 2020
131	IC	IC1920CE522VOYA005002	Sathish Kumar S R; Co-PI: Abhijit Deshpande P	Voyants Solutions Private Limited	Proof checking of structural design and drawing of D wall and construction sequence for Central Square Building	18 September 2019	18 March 2020
132	IC	IC1920CE481PSTE005034	Alagusundaramoorthy P	PST Engineering Construction	Review of the analysis and design of B2 and C types multi-storey buildings for Tamil Nadu Housing Board	2 September 2019	31 August 2020
133	IC	IC1920CE504TWML002786	Mohan S	Tamil Nadu Waste Management Limited	Environmental audit for biomedical waste facility	10 September 2019	30 August 2020
134	IC	IC1920CE575KRIE008111	Apparao G	M/s Krishi Infratech	Proof checking of design of four-lane RoB at Railway Chainage Km. 44/679 between Putalapattu and RVS Nagar Station in AP	1 October 2019	31 March 2020
135	IC	IC1920CE599ZAMI005002	Sathish Kumar S R	Zamil Steel Buildings India Private Limited	Proof checking of structural design of PEBs	17 October 2019	17 April 2020
136	IC	IC1920CE595CPWD008169	Nageswara Rao B	CPWD Madras Central Division I	Third-party Quality assurance of construction of additional office building in the existing GPOA and GPRA campus at Shastri Bhavan, Chennai	1 October 2019	30 September 2021
137	IC	IC1920CE554LTCW008554	Venu Chandra	L&T Construction Water and Effluent Treatment Ic	Vetting and approval of mechanical drawings and documents pertaining to Jharsuguda RWSS, Odisha	1 October 2019	31 December 2020
138	IC	IC1920CE568TPIN002776	Meher Prasad A	Teemage Builders Private Limited	Proof checking of residential buildings for Coimbatore and Trichy Airport	1 October 2019	31 March 2020
139	IC	IC1920CE570RVNL005003	Devdas Menon	Rail Vikas Nigam Limited	Proof checking of Bridge No.357 Substructure (1 no), FoB substructure (1 no), RCC Box structure (2 nos)	4 October 2019	31 March 2020



140	IC	IC1920CE573SKAC005034	Alagusundaramoorthy P	S Kadirvel and Company	Review of the analysis and design of multi-storey residential flats at Chennai for Tamil Nadu Housing Board	1 October 2019	30 September 2020
141	IC	IC1920CE581BCDB005003	Devdas Menon	Bilaspur Central Division	Proof checking of structural design and drawings for the construction of 100-bedded hospital, 32 nos quarters, canteen and mortuary for ESIC at Raigarh	3 October 2019	31 December 2020
142	IC	IC1920CE597MERX002786	Mohan S	Milma Ernakulam Regional Cooperative Milk Producers Union Limited	Adequacy check of effluent treatment plant at Ernakulam Dairy industry	17 October 2019	31 March 2020
143	IC	IC1920CE604AHLX005002	Sathish Kumar S R	Ashiana Housing Limited	Design validation of main building structures	22 October 2019	22 April 2020
144	IC	IC1920CE566BRIG008436	Arul Jayachandran S; Co-PI: Devdas Menon	Bridges Department	Proof checking of design and drawings for the construction bridge over the Virugambakkam Canal from Natesan Nagar Kalliamman Koil Street	3 October 2019	1 November 2019
145	IC	IC1920CE567BRIG008436	Arul Jayachandran S	Bridges Department	Design of a skywalk from Mambalam station to T Nagar Bus stand for Chennai Corporation	3 October 2019	16 October 2019
146	RB	RB1920CE552KTDF005034	Alagusundaramoorthy P	Kerala Transport Development Finance Corporation Limited	Condition assessment and repair and rehabilitation of KSRTC Bus Terminal Complex at Kozhikode	1 October 2019	30 September 2020
147	RB	RB1920CE565SOUT008237	Saravanan U; Co-PI: Arul Jayachandran S	Southern Railways	Continuous health monitoring of the Scherzer Span of the Pamban Bridge	4 October 2019	31 March 2022
148	RB	RB1920CE606VRTC008175	Murali Krishnan J	V R Techniche Consultants Private Limited	Selection of optimal aggregate gradation for Indian Highways	1 November 2019	30 June 2020
149	RC	RC1920CE558AAIX008432	Gitakrishnan Ramadurai	Airports Authority of India	Traffic circulation plan for Chennai Airport	1 October 2019	31 October 2019
150	IC	IC1920CE627HLLX008169	Nageswara Rao B	HLL Infra Tech Services Limited	Proof checking of the proposed construction of Government Medical College, Kottayam, Kerala	1 November 2019	30 September 2020
151	IC	IC1920CE625CALX008436	Arul Jayachandran S	Craftsman Automation Limited	Evaluation of uprights as per EN 15512	29 October 2019	8 November 2019
152	IC	IC1920CE689MRFL008190	Ravindra Gettu	MRF Limited	Fibre reinforced floor design	1 December 2019	29 February 2020

153	IC	IC1920CE670CEWC008111	Apparao G	Central Warehousing Corporation	Design of godowns at Central Warehouse, Port Blair	1 November 2019	30 April 2020
154	IC	IC1920CE694GARR008310	Balaji Narasimhan	Garrison Engineer (P) NW	Vetting of storm water drainage design of Kochi Naval Base	1 December 2019	30 November 2020
155	RB	RB1920CE695APPC008930	Venkatraman Srinivasan; Co-PI: Murty B S, Ligy Philip	Andhra Pradesh Pollution Control Board	Study to conclusively establish the source of groundwater contamination in the wells surrounding the tailing pond of Uranium Corporation of India Limited, Thummalapalli, YSR (Kadapa) district, Andhra Pradesh	16 November 2019	15 November 2020
156	IC	IC1920CE690TPIN002776	Meher Prasad A	Teemage Builders Private Limited	Proof checking for extension part of NIEPMD, Chennai project	22 November 2019	31 May 2020
157	IC	IC1920CE682IMBP005002	Sathish Kumar S R	Intertouch Metal Buildings Private Limited	Proof checking of PEB for M/s Steel Shoppe India Private Limited	21 November 2019	20 May 2020
158	IC	IC1920CE683STRT002804	Rajagopal K	Strata Geosystems India Private Limited	Recommendations for the design and construction of geosynthetic reinforced soil retaining walls	1 November 2019	30 September 2020
159	RC	RC1920CE643GIMI005036	Ligy Philip	Greenenvironment Innovation and Marketing India Private Limited	Consulting services agreement with M/s: Greenenvironment Innovation and Marketing India (P) Limited	1 October 2019	30 September 2022
160	IC	IC1920CE645OCPX008169	Nageswara Rao B	Olympia Cyberspace Private Limited	Vetting of structural design of Cyberspace IT park project at Alathur Road, Guindy	1 November 2019	13 October 2020
161	IC	IC1920CE628LNTX005003	Devdas Menon	Larsen & Toubro Limited	Proof checking for major bridge DMTC 40 and 217	1 November 2019	31 December 2020
162	IC	IC1920CE623ACET008204	Indumathi Manivannan Nambi	Andipalayam Common Effluent Treatment Plant Private Limited	Modification towards achieving zero liquid discharge	15 October 2019	14 November 2019
163	IC	IC1920CE650SPSC008111	Apparao G	SP Singla Constructions Private Limited	Fatigue testing of 15.2mm diameter HT Strands	4 November 2019	31 March 2020
164	IC	IC1920CE651AADI005002	Sathish Kumar S R	Arkie Atelier Design India (P) Limited	Proof checking of building designs for NITK Surathkal	1 November 2019	1 May 2020
165	IC	IC1920CE657KSNT008436	Arul Jayachandran S	KSN Tech Ventures Private Limited	Design vetting of three sheds designed by M/s KSN ventures for Reliance, Mukutban	15 November 2019	29 November 2019

166	IC	IC1920CE649KRIE002804	Rajagopal K	Krishi Infratech	Consultancy services for construction of geosynthetic reinforced soil walls for RoB approach roads	1 November 2019	29 October 2020
167	IC	IC1920CE666IBPP008436	Arul Jayachandran S	Interarch Building Products Private Limited	Design vetting of PEBs designed by M/s Interarch Building Products (P) Limited for M/s ONGC	11 November 2019	06 December 2019
168	IC	IC1920CE667KIRB008436	Arul Jayachandran S	Kirby Building Systems and Structures India Private Limited	Vetting the design of buildings HY-05656A1 and HW-05140A1 for M/s. Instakart Services Private Limited by Ms Kirby Building Systems	11 November 2019	30 November 2019
169	IC	IC1920CE792TSCB002777	Boominathan A	Tamilnadu Slum Clearance Board	Geotechnical investigation at Vembuliamman Koil Street and M.S. Nagar (Egmore) for reconstruction of slum tenements	7 December 2019	31 December 2020
170	IC	IC1920CE771HQPS002776	Meher Prasad A; Co-Pls: Prakash Maiya M, Krishna Vasudevan, Subhadeep Banerjee	HQ Project Seabird	Third-party review and design vetting of Project Seabird Phase IIA DC-NAD Package	10 December 2019	31 December 2020
171	IC	IC1920CE763GARR008169	Nageswara Rao B	Garrison Engineer [P] (N) Military Engineer Services	Structural integrity/soundness of the various buildings of the residential quarters at NAD, Sunabeda	1 December 2019	31 December 2019
172	IC	IC1920CE764TCAS008169	Nageswara Rao B	Tamil Nadu Cricket Association	Condition assessment of the reinforced concrete (RC) structural elements of the terrace (wing beam) and gallery (seating area) at the Pavilion end of M.A. Chidambaram Stadium	5 December 2019	4 December 2020
173	IC	IC1920CE713DLFD008436	Arul Jayachandran S	DLF Limited	Structural vetting provision of stability certificate of Block - 12 DLF - IT/ITES, SEZ Manapakkam, Chennai	10 December 2019	31 December 2019
174	IC	IC1920CE761LNTL002776	Meher Prasad A	Larsen & Toubro Limited	Proof checking of structural design/drawings for NXTRA Datacenter Chennai, Siruseri	6 December 2019	30 November 2020
175	IC	IC1920CE776INKL008436	Arul Jayachandran S	INKEL Limited	Proof checking -bridge design in Trivandrum Medical College Project	12 December 2019	31 December 2019

176	IC	IC1920CE807DCPL008169	Nageswara Rao B	Development Consultants Private Limited	Proof checking and vetting of structural design calculations and drawings of sheds having PEB roofs, including foundation for IOCL LPG bottling plants at Korba, Sitarganj, Khurda and Kharagpur	1 December 2019	30 November 2020
177	IC	IC1920CE819JCEP005034	Alagusundaramoorthy P	JTP Consulting Engineers Private Limited	Review of civil/structural design and drawings for the proposed axle shop for COFMOW in RWF Bangalore	1 December 2019	31 October 2020
178	IC	IC1920CE775MACA002804	Rajagopal K	Maccaferri Environmental Solutions Private Limited	Recommendation of interface properties between Paralink and different types of soils and Gabions	1 December 2019	2 October 2020
179	IC	IC1920CE765CMKP005034	Alagusundaramoorthy P	CMK Projects Private Limited	Review of the analysis and design and vet the drawings of flats at Hodd Hunter Nagar for TNHB	1 December 2019	31 December 2020
180	IC	IC1920CE766SKIL005034	Alagusundaramoorthy P	Skilled Construction Company Limited	Review of the structural design and drawing of composite girders of 40m span and 30m span	1 December 2019	31 December 2020
181	IC	IC1920CE767KVJS005034	Alagusundaramoorthy P	K V Joseph and Sons Private Limited	Condition assessment and repairing of microconcrete flooring on existing Ernakulam wharf	1 December 2019	31 December 2020
182	IC	IC1920CE758EPEP005034	Alagusundaramoorthy P	Eco Protection Engineers Private limited	Review of the structural design calculations and vet the drawings of 36MLD and 20MLD capacity STPs and 196 MLD capacity WTP for Tiruppur Municipal Corporation, Tamil Nadu	1 December 2019	31 December 2020
183	IC	IC1920CE702KELL008160	Robinson R G; Co-PI: Subhadeep Banerjee	Keller Ground Engineering India Private Limited	Proof checking of ground improvement works for IOCL projects at Paradip	9 December 2019	31 December 2020
184	IC	IC1920CE809BPCL005034	Alagusundaramoorthy P	Bharat Petroleum Corporation Limited	Modification of overhead railway bridge No. 6 of cryogenic pipeline at BPCL in Uran at Mumbai	1 December 2019	31 October 2020
185	IC	IC1920CE813MARA002777	Boominathan A; Co-PI: Subhadeep Banerjee	Maradu Municipality	Monitoring of ground vibrations during demolition of high rise buildings - Maradu, Ernakulam, Kerala	27 December 2019	27 May 2020
186	IC	IC1920CE793CERA008111	Apparao G	Cera Chem Private Limited	Characterisation of high-strength CERA Grout 40G	1 December 2019	30 June 2020

187	IC	IC1920CE927RAIL008169	Nageswara Rao B	Rail Vikas Nigam Limited	Proof checking and vetting of structural design of RCC box of minor bridge, design of foundation of FoB and design of RCC/face/return wall	23 January 2020	22 January 2021
188	IC	IC1920CE868SCRX008169	Nageswara Rao B	South Central Railway	Checking and vetting of design and drawings of foundations and substructure of important bridge across Vasista river (19×76.20 m open web girder)	12 December 2019	11 December 2020
189	IC	IC1920CE873PWDX008436	Arul Jayachandran S	Public Works Department	On-site stability checking of Anaikarai bridge	8 January 2020	31 January 2020
190	IC	IC1920CE854HIGD008169	Nageswara Rao B	Highways Department	Condition assessment of the Mayor Muthu Bridge (km 443/8 - 444/2) on NH-7 of the Madurai (Highways) C&M Division, Madurai	2 January 2020	1 January 2021
191	RB	RB1920CE826HPCL008175	Murali Krishnan J	Hindustan Petroleum Corporation Limited	Laboratory evaluation of rutting and fatigue response of sulfur modified bituminous mixtures	6 January 2020	4 January 2021
192	IC	IC1920CE858TAMU005003	Devdas Menon	Tamilnadu Road Development Company Limited	TNRDC - Development of Comprehensive Integrated Traffic Infrastructure at TIDEL Park Junction, including U-shaped flyovers at TIDEL Park Junction and Indira Nagar Junction in Rajiv Gandhi Salai - proof checking of structural design	10 January 2020	31 July 2020
193	IC	IC1920CE849MRDL008169	Nageswara Rao B	Mahindra Residential Developers Limited	Structural stability of C7, C8 and C9 tower blocks (stilt + eight floors) of Aquality Project at Mahindra World City	1 January 2020	31 December 2020
194	IC	IC1920CE850LTCW005034	Alagusundaramoorthy P	Larsen & Toubro Limited Construction Water and Effluent Treatment IC	Byarma Multi Village Rural Water Supply Scheme Damoh district	1 January 2020	31 December 2020
195	IC	IC1920CE851LTCW005034	Alagusundaramoorthy P	Larsen & Toubro Limited Construction Water and Effluent Treatment IC	Review of the analysis vetting and approval of civil engineering design and drawings for Buxwaha Multi-Village Rural Water Supply Scheme	1 January 2020	31 December 2020

196	IC	IC1920CE852LTCW005034	Alagusundaramoorthy P	Larsen & Toubro Limited Construction Water and Effluent Treatment IC	Review of the analysis vetting and approval of designs and drawings of Mohanpura Multi-Village Rural Water Supply Scheme	1 January 2020	31 December 2020
197	RB	RB1920CE844TATC002776	Meher Prasad A; Co-PIs: Nageswara Rao B, Subhadeep Banerjee	Tata Consultancy Service Limited	Centre for Finite Element Analysis and Design (CFEAD)	1 January 2020	31 December 2020
198	IC	IC1920CE835PEIL005002	Sathish Kumar S R	Pennar Industries Limited	Proof checking of PEB designs for Wipro, DLM and Chettinad	1 January 2020	5 May 2020
199	IC	IC1920CE922LTCW008554	Venu Chandra	L&T Construction, Water and Effluent Treatment IC	Augmentation and strengthening of Dhanbad Urban water Supply Scheme Phase-II Under Dhanbad Municipal Corporation, Jharkhand	20 January 2020	31 May 2021
200	IC	IC1920CE865NACO008169	Nageswara Rao B	Nagesh Consultants	Design vetting of flyover (at Chainage 2+200) as part of Tuticorin to Tirunelveli section from km 0/0 to km 47/250 of NH-138 (erstwhile NH- 7A) in Tamil Nadu under Tuticorin PIU	1 January 2020	31 December 2020
201	IC	IC1920CE939LNTL008344	Raghukanth S T G	Larsen & Toubro Limited	Site-specific spectra for Dhubri-Phulbari site in Assam	28 January 2020	28 January 2021
202	IC	IC1920CE930AECPO05034	Alagusundaramoorthy P	Aadriks Engineering and Consultants Private Limited	Review of the analysis and design of Multipurpose Hall at Kudankulam	20 January 2020	31 December 2020
203	IC	IC1920CE863KPRC008111	Apparao G	K.P.R. Construction	Proof checking of structural designs and detailing of four-lane ROB at Km 84/04-05 between Akiveedu and Pallevada stations in AP	9 January 2020	31 March 2020
204	IC	IC1920CE864ECET005036	Ligy Philip	Erode Common Effluent Treatment Plant Private Limited	Detailed Project Report for ZLD for proposed CETP for RO Reject in Erode	10 January 2020	9 July 2020
205	IC	IC1920CE876ESCP008436	Arul Jayachandran S	Eversendai Construction Private Limited	Field testing of profiled decksheet	6 January 2020	25 January 2020
206	RB	RB1920CE838ARPL008105	Dodagoudar G R	Amara Raja Infra Private Limited	Seismic site characterization and development of site spectra for new CATF Building Site at ISITE Campus Mathahalli, for ISRO Bangalore	23 December 2019	22 December 2023

207	IC	IC1920CE848ARPL002776	Meher Prasad A	Amara Raja Infra Private Limited	Combined raft foundation system and RCC pedestals for supporting reflectors, DUT Positioner and Feed Positioner inside the New CATF facility	10 January 2020	10 January 2021
208	IC	IC1920CE859EGCL008436	Arul Jayachandran S	Expo Gas Containers Limited	Proof checking the design of tanks-fire walls at IOCL Ahmedabad Terminal	8 January 2020	31 January 2020
209	RB	RB1920CE860KREA008566	Soumendra Nath Kuiry; Co-PI: Balaji Narasimhan	KREA University	Hydrological study to analyse the vulnerability of flooding at the proposed Krea University site, AP	15 January 2020	14 April 2020
210	IC	IC1920CE862MWCD005002	Sathish Kumar S R	Megawide Construction DMCC	Structural design certification for MOPA Airport Goa	14 January 2020	31 December 2020
211	IC	IC1920CE1031INDR002777	Boominathan A	Indian Railways	Suitability of soil for railway earthwork and blanket	11 February 2020	11 April 2020
212	IC	IC1920CE1010TSCB002777	Boominathan A	Tamilnadu Slum Clearance Board	Construction of multi-storey slum tenements at Perumbakkam and Semmanchery Schemes - soil investigation	1 February 2020	2 February 2021
213	IC	IC1920CE963TSCB002777	Boominathan A	Tamilnadu Slum Clearance Board	Reconstruction of slum tenements in Gandhi Nagar in Corporation Dn.No.96: Soil investigation	27 January 2020	31 March 2021
214	IC	IC1920CE966CCED002776	Meher Prasad A	Chief Construction Engineer (R&D) Delhi	Third-party approval of structural designs and drawings for the Nau Sena Bhawan, Near Rajaji Marg in New Delhi	30 January 2020	31 December 2020
215	IC	IC1920CE999LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the analysis and design of structures of individual rural piped water supply project pertaining to Kendrapeda, Jharsuguda and Angul districts in Odisha	1 February 2020	31 January 2021
216	IC	IC1920CE1000LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the analysis and design of structures for individual rural piped water supply project pertaining to Cuttack and Jagatsinghpur districts in Odisha	1 February 2020	4 January 2021
217	IC	IC1920CE1001LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the analysis and design of structures for rural piped water supply project pertaining to Nuapada district in Odisha	1 February 2020	3 February 2021

218	IC	IC1920CE1018LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the design of RCC delivery chambers DC01A and DC01B for Kundalia Irrigation Project Left Bank	1 January 2020	31 January 2021
219	IC	IC1920CE1019LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the analysis and design of irrigation structures for ISP Kalisindh Phase I Micro Lift Irrigation Project	1 January 2020	31 January 2021
220	IC	IC1920CE1020LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the analysis and design and vet the drawings of RCC delivery chambers DC02 A and 02 B for Kundalia Irrigation Project Right Bank	2 February 2020	3 February 2021
221	IC	IC1920CE1021LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the analysis and design of structures for the Payali Multi-Village Rural Water Supply Scheme in districts Jabalpur, Narashingpur and Seoni	6 February 2020	28 February 2021
222	IC	IC1920CE1022LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the analysis and design of structures for two numbers of individual rural piped water supply projects pertaining to Mayurbhanj district, Odisha	10 February 2020	28 February 2021
223	IC	IC1920CE984LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the analysis and design of structures of Kundaliya Multi Village Water Supply Scheme in Rajgarh district, Madhya Pradesh	1 January 2020	31 January 2021
224	IC	IC1920CE985LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the analysis and design of structures for Satna-Bansagar Multi-Village Rural Water Supply Scheme in Madhya Pradesh	1 January 2020	31 January 2021
225	IC	IC1920CE986LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the analysis and design of structures for the rural water supply projects pertaining to Keonjhar district, Odisha	10 February 2020	09 February 2021
226	IC	IC1920CE1025AIRP008335	Thyagaraj T; Co-PI: Subhadeep Banerjee	Airports Authority of India	Ground improvement for the New Apron with Link Taxiways at VSI Airport, Port Blair	3 February 2020	31 August 2020
227	IC	IC1920CE981LNTL005003	Devdas Menon	Larsen & Toubro Limited	Design qualification tests for PSC track sleepers (RDSO/T-7008)	4 February 2020	31 August 2020



228	IC	IC1920CE1035TIRS005036	Ligy Philip	Tirunelveli Smart City limited	Tirunelveli City Municipal Corporation, construction of sewage treatment plant	24 January 2020	23 July 2020
229	IC	IC1920CE1036CIAS005036	Ligy Philip	Chemical Industries Association	Characterization of the surface water sludge and feeders to the water bodies in and around Ranipet Industrial area	20 February 2020	19 February 2021
230	IC	IC1920CE948BGRE008169	Nageswara Rao B	BGR Energy Systems Limited	Condition assessment of TG columns, NDCT raker columns and RC piers of the Cooling Water PH	10 January 2020	9 January 2021
231	IC	IC1920CE950TRED008169	Nageswara Rao B	Trif Real Estate and Development Limited	Building vibration analysis of Trilium Mall, Nagpur	27 January 2020	26 January 2021
232	IC	IC1920CE951KITC005003	Devdas Menon	M/s Kitco Limited	Proof checking of construction of GV Raja Centre of Excellence, Menamkulam, Trivandrum	29 January 2020	31 July 2020
233	IC	IC1920CE949VNCP002776	Meher Prasad A	Vijay Nirman Company Private Limited	Proof checking of construction of a composite-level grade separators with architectural fixings aesthetics, service roads etc., at Naval Armament Depot (NAD) Junction, Visakhapatnam	29 January 2020	31 July 2020
234	RB	RB1920CE1050VIKI008459	Radhakrishna G Pillai; Co-PIs: Lakshman Neelakantan, Venugopal S	Viki Industries Private Limited	Corrosion and mechanical characteristics of galvanized and plasma-coated steel reinforcement	10 February 2020	31 December 2020
235	IC	IC1920CE1030TMSP008169	Nageswara Rao B	Technomedia Solutions Private Limited	Condition assessment of the existing columns and associated structure of Maalai Malar building at Egmore, Chennai to accommodate proposed mezzanine floor and issuance of safety certificate	17 February 2020	16 February 2021
236	IC	IC1920CE982KECP008554	Venu Chandra	Kevadiya Construction Private Limited	Begusarai sewerage network and STP project	10 February 2020	31 December 2021
237	IC	IC1920CE960WSIP002786	Mohan S	Water Systems India Private Limited	Adequacy check for the proposed 450 KLD sewage treatment plant	31 January 2020	31 October 2020
238	IC	IC1920CE961WSIP002786	Mohan S	Water Systems India Private Limited	Adequacy check for proposed 60 KLD effluent treatment plant	1 February 2020	30 September 2020

239	IC	IC1920CE962TEPL008169	Nageswara Rao B	Triveni Engicons Private Limited	Proof checking services for major bridge at Ch 0+389 from Kanko Chowk to Binod Bihari Chowk Via Shakthi Chowk Road in Dhanbad NCB01 for State Highway Authority of Jharkhand (SHAJ)	29 January 2020	28 January 2021
240	IC	IC1920CE971RGPP008941	Phanisri Pradeep Pratapa; Co-PI: Radhakrishna G Pillai	Ratnagiri Gas and Power Private Limited	Structural/condition assessment of cooling tower at RGPPL	15 January 2020	15 June 2020
241	IC	IC1920CE972LNTL002776	Meher Prasad A	Larsen & Toubro Limited	Proof checking of structural design and drawings for development of transit storage yard and material receiving and dispatch centre at ONGC, Kakinada, Andhra Pradesh	3 February 2020	31 December 2020
242	IC	IC1920CE973VGSP005002	Sathish Kumar S R	Volta Green Structures Private Limited	Proof checking of PEB design for Mahindra at Pune and Kharagpur	5 February 2020	5 August 2020
243	IC	IC1920CE979BAAS008169	Nageswara Rao B	Baashyaam Constructions Private Limited	Proof checking and vetting of structural design of proposed multi-storey building, The Plutus Residence, Old No 148/ New No 32, LB Road, Adyar, Chennai, 600041 - 18 floors, parking - three basements+stilt	3 February 2020	2 February 2021
244	IC	IC1920CE980LNTL008893	Alagappan Ponnalagu	Larsen & Toubro Limited	Underwater shock wave experimental testing	3 February 2020	3 April 2020
245	IC	IC1920CE994MEPL008436	Arul Jayachandran S	Metafold Engineering Private Limited	Development of design data for cold formed steel pallet rack components as per EN15512 EN validation of rack products of M/s Metafold Engineering Private Limited, Pune	10 February 2020	16 March 2020
246	IC	IC1920CE1058ACXX008204	Indumathi Manivannan Nambi	Ankita Construction	Performance evaluation study of 15.55 MLD, STP at Narasaraopet	1 March 2020	10 July 2020
247	IC	IC1920CE1103TSCB005034	Alagusundaramoorthy P; Co-PI: Sathish Kumar S R	Tamilnadu Slum Clearance Board	Analysis and design and issue of drawings for the construction of super structures and foundation for the project at Reddiyarpatti in Palayamkottai taluk, Tamil Nadu	29 January 2020	28 January 2021

248	IC	IC1920CE1104TSCB005034	Alagusundaramoorthy P; Co-PI: Sathish Kumar S R	Tamilnadu Slum Clearance Board	Analysis and design and issue of drawings for the construction of super structures and foundation for the project at Vallam Vadaku Sethi village in Tanjore district	29 January 2020	28 January 2021
249	IC	IC1920CE1119TBSS005002	Sathish Kumar S R	Tata Bluescope Steel Private Limited	Proof checking of structural design of PEB for IUP Jindal Metal Alloys at Haryana	14 March 2020	14 September 2020
250	IC	IC1920CE1116KELL008160	Robinson R G; Co-PI: Subhadeep Banerjee	Keller Ground Engineering India Private Limited	Ground improvement work using vibro stone columns for mounts, fire water tanks and other buildings at Cochin LPG Import Terminal	1 April 2020	31 March 2021
251	CR	CR1920CE1131SBSP008502	Sachin S Gunthe	Sharp Business Systems India Private Limited	High altitude air pollution monitoring - Munnar, Kerala	1 April 2020	30 March 2021
252	IC	IC1920CE1115LNTL002786	Mohan S	Larsen & Toubro Limited	Surface and sub-surface permeability and groundwater recharge assessment study	1 March 2020	28 February 2021
253	IC	IC1920CE1118TAMU005003	Devdas Menon	Tamilnadu Road Development Company Limited	Construction of elevated corridor over at CORR phase-II	13 March 2020	30 September 2020
254	IC	IC1920CE1074TRIC005003	Devdas Menon	Tamilnadu Road Infrastructure Development Corporation	Construction of interchange at KM 47/4 of GST Road	3 March 2020	28 August 2020
255	IC	IC1920CE1075LTCW005034	Alagusundaramoorthy P	L&T Construction, Water and Effluent Treatment IC	Review of the design of RCC delivery chambers DC02 DC03 for Kundalia Irrigation Project Left Bank	1 March 2020	02 February 2021
256	IC	IC1920CE1064LTCW008554	Venu Chandra	L&T Construction Water and Effluent Treatment IC	Vetting and approval of mechanical drawings and documents pertaining to Keonjhar RWSS - 03, Odisha	1 March 2020	31 May 2022
257	IC	IC1920CE1066LTCW008111	Apparao G	L&T Construction, Water and Effluent Treatment IC	Proof checking of structural design calculations and drawings for construction of sewage pumping station at Saidpur Project in Patna	1 March 2020	31 July 2020
258	IC	IC1920CE1059HIGD008347	Dali Naidu Arnepalli	Highways Department	Evaluation of geogrids for construction of RE wall at ROB, bypass road to Thiruttani	25 February 2020	25 August 2020

259	IC	IC1920CE1105RUBB005034	Alagusundaramoorthy P	Rubber Board	Condition assessment of Silver Jubilee Memorial Building at Rubber Board Kottayam	11 March 2020	01 December 2020
260	IC	IC1920CE1111KANN008111	Apparao G	Kannur University	Vetting of detailed drawings and design of Administrative Building at Kannur University	1 March 2020	30 June 2020
261	IC	IC1920CE1099KHRI008459	Radhakrishna G Pillai; Co-PIs: Manu Santhanam, Ravindra Gettu, Piyush Chaunsali	Kerala Highway Research Institute	Good practices for construction, maintenance and repair of concrete bridges	10 March 2020	01 October 2020
262	IC	IC1920CE1072CRNA002776	Meher Prasad A	C R Narayana Rao Consultants Private Limited	Proof checking of National Payments Corporation of India-Construction of Tier IV Captive Data Center (CDC) in Chennai and Hyderabad	18 February 2020	18 February 2021
263	IC	IC1920CE1073LNLT002776	Meher Prasad A	Larsen & Toubro Limited	Third-party proof check of structural design/drawings for the construction of Assam Cancer Care Hospitals at 18 locations in Assam	26 February 2020	31 August 2020
264	IC	IC1920CE1063KRIE008111	Apparao G	M/s Krishi Infratech	Vetting of structural designs and drawings of four-lane RoB LC No. 75 between Mulvad and Jumnal stations on Bijapur-Hubli NH218	3 March 2020	30 June 2020
265	IC	IC1920CE1076TPLT008344	Raghukanth S T G	Tata Projects Limited	PSHA analysis of bridge over Brahmaputra river between Dhubri and Phulbari	2 March 2020	02 March 2021
266	IC	IC1920CE1079BAAS008169	Nageswara Rao B	Baashyaam Constructions Private Limited	Proof checking and vetting of structural design drawings and documents (including foundations) of proposed residential development at Koyambedu Chennai	3 March 2020	02 March 2021
267	IC	IC1920CE1087LEIP008111	Apparao G	Lekcon Infrastructure Private Limited	Vetting of designs and drawings of RoB @ Ch. 93+736 along NH-544DD in Kalyanadurg-Molakamuru Section	2 March 2020	30 June 2020
268	RB	RB1920CE1062UOEA008276	Ashwin Mahalingam	University of East Anglia	Urban and peri urban agriculture as green infrastructure	18 November 2019	17 November 2021
269	IC	IC1920CE1065STLC008175	Murali Krishnan J	Sripath Technologies LLC	Investigations on the use of PGXpand with bitumen processed in Indian Refineries	2 March 2020	31 December 2020

## List of consultancy projects sanctioned during the financial year 2020-2021

1	IC	IC2021CE026ZAMI005002	Sathish Kumar S R	Zamil Steel Buildings India Private Limited	Proof checking of PEB design for Growever and Cella Space	1 April 2020	17 September 2020
2	IC	IC2021CE027ICIL005002	Sathish Kumar S R	Indian Commerce & Industries Company Private Limited	Proof checking of PEBs for Sundaram Fasteners	1 April 2020	17 September 2020
3	CR	CR2021CE003ITPL002795	Koshy Varghese; Co-PI: Arul Jayachandran S	Ionixx Technologies Private Limited	Fabrication and commissioning of prefabricated doffing rooms for CHMC for COVID-19	6 April 2020	30 June 2020
4	CR	CR2021CE004KSPL002795	Koshy Varghese; Co-PI: Arul Jayachandran S	Kumaran Systems Private Limited	Fabrication and commissioning of prefabricated doffing rooms for CHMC for COVID-19	6 April 2020	30 June 2020
5	IC	IC2021CE042TPL005002	Sathish Kumar S R	Tata Projects Limited	Proof checking of PEB for ICF2750 at Chennai	17 March 2020	17 September 2020
6	IC	IC2021CE033SBEL002804	Rajagopal K	Shree Balaji Engicons Limited	Proof checking and approval of approach roads for JSG-Barpali Rail Line Project	19 March 2020	18 September 2020
7	IC	IC2021CE022TSCB002777	Boominathan A	Tamilnadu Slum Clearance Board	Geotechnical Investigation for construction slum tenements with G+5 and G+4 pattern in Old Block Vyasarpadi Scheme (phase 1 to 4) in Corporation Dn.No.46 and MGR Nagar scheme in Corporation Dn. No.37, Chennai	1 March 2020	31 March 2021
8	IC	IC2021CE036RDPC008169	Nageswara Rao B	RSP Design Consultants (India) Private Limited	Proof checking and vetting of structural designs/ drawings of JFP Hindu Heritage Experience two buildings (1) Lotus Building; and (2) Namaste Building at Mangarh, Uttar Pradesh	17 March 2020	16 March 2021
9	IC	IC2021CE044HYPL005036	Ligy Philip	Hydromaterials Private Limited	Vetting of design of iron-arsenic removal plants to be installed in Punjab	27 April 2020	26 October 2020
10	IC	IC2021CE023VATE008671	Mathava Kumar S	VA Tech Wabag Limited	Proof checking of civil engineering documents and drawings for development of sewerage treatment plant at Digha and Kankarbagh Zones of Patna, Bihar	18 March 2020	31 March 2021

11	IC	IC2021CE024VATE008554	Venu Chandra	VA Tech Wabag Limited	Proof checking of STP plant and sewerage network in Digha and Kankarbagh, Patna Bihar	17 March 2020	31 May 2022
12	IC	IC2021CE025NTCE005002	Sathish Kumar S R	NTC Engineering and PMC LLP	Proof checking of PEB design for Shreevari Towers at Melakaranthai	1 April 2020	17 September 2020
13	RB	RB2021CE040DUKE005036	Ligy Philip	Duke University	Sustainability of India - EFT platform	21 April 2020	16 February 2021
14	IC	IC2021CE061KGKD008204	Indumathi Manivannan Nambi	Kumarapalayam Green Kavery Dyeing Cluster	Vetting of DR and design adequacy check in Namakkal	20 March 2020	19 June 2020
15	IC	IC2021CE0550MCC005034	Alagusundaramoorthy P	Omkar Construction Company	Review of the design of temporary supports and connection details of modification of overhead Railway Bridge No. 6 of cryogenic pipeline at BPCL in Uran Mumbai	2 March 2020	1 March 2021
16	IC	IC2021CE0562TNHB005034	Alagusundaramoorthy P	Tamil Nadu Housing Board	Review of the analysis and design of the proposed construction of 20 MIG flats at Phase-III in Hosur for Tamil Nadu Housing Board	28 November 2019	27 May 2020
17	IC	IC2021CE062TWML002786	Mohan S; Co-PI: Robinson R G	Tamilnadu Waste Management Limited	Design and monitoring of Cell 8 at Tamil Nadu Waste Management Limited Gummidipoondi	15 March 2020	31 December 2021
18	IC	IC2021CE058HPCL008169	Nageswara Rao B	Hindustan Petroleum Corporation Limited	Consultancy services for Chimney Civil Foundation modification	8 May 2020	7 May 2021
19	IC	IC2021CE067RAIL008169	Nageswara Rao B	Rail Vikas Nigam Limited	Proof checking and vetting of structural design and drawings of proposed bridges (Br. No. 327, 361, 400, 577, 588 and 4) for doubling of BG between Vanchi Maniyachi and Nagercoil with 25 tonne axle loading	18 May 2020	17 May 2021
20	IC	IC2021CE078GARR008169	Nageswara Rao B	Garrison Engineer	Soundness assessment of Viswanathan Building, Admin Block of CSD Depot, and structural stability and load test of existing mast at Raw Complex Naval Base Kochi	18 May 2020	17 March 2021
21	CR	CR2021CE079TWOC008926	Piyush Chaunsali; Co-PI: Manu Santhanam	Tide Water Oil Company (India) Limited	Beneficial utilization of agricultural (stubble) waste in structural materials	23 March 2020	22 March 2023

22	IC	IC2021CE072PWX008169	Nageswara Rao B	Public Works Department	Proof checking of the proposed construction of structural design for proposed construction of Engineering College at Yanam in UT of Puducherry	20 May 2020	19 May 2021
23	RB	RB2021CE059GNCT008251	Shiva Nagendra S M	Government of National Capital Territory of Delhi	Microanalysis of ambient particulate matter characteristics in contrasting areas of Delhi megacity during COVID-19 national lockdown	1 May 2020	31 October 2020
24	IC	IC2021CE054NAHI005034	Alagusundaramoorthy P; Co-PI: Sathish Kumar S. R.	National Highways	Condition assessment of existing Vettar Bridge in NH 45A at Km 186/603-187/072 in Nagapattinam district	13 March 2020	12 March 2021
25	IC	IC2021CE099PISL008169	Nageswara Rao B	Proclaim Insurance Surveyors and Loss Assessors Private Limited	Assessment of settlement problem reported in ongoing construction work at International Flavors and Fragrance at Sricity, AP	1 July 2023	9 January 2021
26	IC	IC2021CE100SKIP008436	Arul Jayachandran S	Skipper Limited	Design checking of 12 nos 232 KV steel poles for M/s Skipper Limited	1 July 2024	16 June 2020
27	IC	IC2021CE101VALM008436	Arul Jayachandran S	Valmont Structures Private Limited	Design vetting steel transmission line poles-232 kV	1 July 2025	23 June 2020
28	IC	IC2021CE094SKAC008671	Mathava Kumar S	S Kadirvel and Company	Vetting the design of four MLD sewage treatment plant (STP) at Periyakulam Lake, Coimbatore	1 July 2030	30 September 2020
29	IC	IC2021CE090CVCC008169	Nageswara Rao B	Cherian Varkey Construction Company Private Limited	Proof checking and vetting of structural design and drawings of proposed construction of Azhimavukadavu River Bridge in Thrissur district	1 July 2031	1 June 2021
30	IC	IC2021CE120JMCC008111	Apparao G	JMC Constructions Private Limited	Proof checking of designs and drawings of major and minor bridges between Murukumbattu Jn and Rangampet Cross in AP	1 July 2040	31 August 2020
31	IC	IC2021CE110DILI008190	Ravindra Gettu	Dilip Buildcon Limited	Shotcrete testing for Rewa-Sidhi Road Tunnel on NH75E	1 July 2049	30 September 2020
32	IC	IC2021CE117PNCI008436	Arul Jayachandran S	PNC Infratech Limited	Proof checking the design of ROB at Km 367+568 Challakere Hiriyur Road Project	1 July 2050	30 June 2020

33	RB	RB2021CE121LTCW008566	Soumendra Nath Kuiry; Co-PI: Pallab Sinha Mahapatra	L&T Construction, Water and Effluent Treatment IC	Preparing and submitting of CFD analysis reports and drawing for Satna Rural Water Supply Scheme of Madhya Pradesh	1 July 2054	22 June 2020
34	IC	IC2021CE130KMRC002804	Rajagopal K; Co-PIs: Ramesh Kannan Kandasami, Chandrasekhar Annavarapu Srinivas	Kolkata Metro Rail Corporation Limited	Consultancy services for restoration of tunneling works in Kolkata East West Metro Line	1 July 2058	02 February 2021
35	IC	IC2021CE131LNTN008436	Arul Jayachandran S	L&T Infrastructure Engineering Limited	Consultancy services for proof checking the structural design, detailing of the reconstruction of four-lane Tallah RoB (Hemanta Setu) adjacent to Tala Railway Station on Barrackpore Trunk Road, Kolkata, West Bengal	1 July 2059	31 July 2020
36	IC	IC2021CE124LTCN008554	Venu Chandra	Larsen & Toubro Limited	Vetting and approval of design calculations along with process descriptions for STP of both 165 and 315 KLD at Olympia Grande	1 July 2061	14 June 2020
37	IC	IC2021CE180TSCB002777	Boominathan A	Tamilnadu Slum Clearance Board	Soil investigation for construction of 2,184 nos of tenements at Arungulam Pocket 1, 2 and 3 project schemes at Tiruvallur district	14 July 2020	31 July 2021
38	IC	IC2021CE198PSLI008436	Arul Jayachandran S	Peb Steel Lloyd India Limited	Proof checking the design of PEBs for Central Ware Housing at Devanahalli, Karnataka	17 July 2020	24 July 2020
39	CR	CR2021CE155TUBE002795	Koshy Varghese; Co-PI: Arul Jayachandran S	Tube Investments of India	Fabrication and commissioning of prefabricated doffing rooms for CHMC for COVID-19	1 July 2020	30 September 2020
40	IC	IC2021CE171LNTL008478	Subhadeep Banerjee	Larsen & Toubro Limited	Review and approval of methodology/procedure adopted for liquefaction assessment during bidding stage and detail engineering stage for 16 bridge structures for DFCC CTP 14	6 July 2020	31 July 2021
41	IC	IC2021CE168LNTL008478	Subhadeep Banerjee; Co-PI: Boominathan A	Larsen & Toubro Limited	Geotechnical consultancy of Assam cancer hospitals	1 July 2020	31 August 2021



42	IC	IC2021CE173NCCI002776	Meher Prasad A	NCC Limited	Vetting of structural design and drawings of the Metro Bhavan, Operations Control Center and Training Academy for Mumbai Metro Rail Project at Aarey Mumbai	4 July 2020	4 July 2022
43	IC	IC2021CE175SMGD002776	Meher Prasad A	SMG Design Inc	Proof checking of Provision of composite civil infrastructure and allied services (Non-IT) for establishment of Data Center at Hyderabad in Design and Build Mode	8 July 2020	31 January 2021
44	IC	IC2021CE177VEIL005002	Sathish Kumar S R	VENSA Infrastructure Limited	Proof checking design for EMC Project at Raviryal for TSIIC Hyderabad	10 July 2020	31 March 2021
45	IC	IC2021CE178TPLT005002	Sathish Kumar S R	Tata Projects Limited	Proof checking structural design for ICF LHB Project at Chennai	10 July 2020	31 March 2021
46	IC	IC2021CE179KNRC008169	Nageswara Rao B	KNR Constructions Limited	Proof checking and vetting of (i) Major Bridge at CH:56+730; (ii) Minor Bridge at CH:43+142; and (iii) Box MNBR (1x10.0x2.5) at CH:42+672	8 July 2020	7 July 2021
47	IC	IC2021CE170LTHL002777	Boominathan A; Co-PI: Subhadeep Banerjee	L&T Hydrocarbon Engineering Limited	Investigation on Full Hydrocracker unit Foundation Problem at HPCL, Visakhapatnam	1 August 2019	31 August 2020
48	IC	IC2021CE189LNTL008566	Soumendra Nath Kuiry	Larsen & Toubro Limited	Checking surge simulations for Odisha mega lift irrigation project Cluster IV	12 May 2020	31 December 2020
49	IC	IC2021CE196LNTL008566	Soumendra Nath Kuiry	Larsen & Toubro Limited	Checking surge simulations, required devices and report with necessary modification	12 May 2020	31 December 2020
50	IC	IC2021CE210MFLX008671	Mathava Kumar S; Co-PI: Indumathi Manivannan Nambi	Madras Fertilizers Limited	Assessment of hazardous waste management and air quality management at M/s Madras Fertilizers Limited	1 August 2020	31 October 2020
51	IC	IC2021CE205TIFM008276	Ashwin Mahalingam; Co-PIs: Meher Prasad A, Boominathan A, Amlan K Sengupta, Subhadeep Banerjee	Tamil Nadu Infrastructure Fund Management Corporation Limited	Peer review of designs for TN Commerce Hub	23 July 2020	23 April 2021

52	IC	IC2021CE190SCEP008169	Nageswara Rao B	SAI Consulting Engineers Private Limited	Proof checking and vetting of structural design calculations and drawings of various building structures located at Kailasagiri Hill Park in Visakhapatnam	17 July 2020	16 July 2021
53	IC	IC2021CE191KIRB005002	Sathish Kumar S R	Kirby Building Systems and Structures India Private Limited	Proof checking design of PEB for M/s ISRO project at Bangalore	18 July 2020	31 December 2020
54	IC	IC2021CE188SDIN008436	Arul Jayachandran S	SD Infra	Proof checking the designs of an ROB at Kumarapalyaam near Trichy	17 July 2020	24 July 2020
55	IC	IC2021CE185NHPP008169	Nageswara Rao B	Navin Housing and Properties Private Limited	Proof checking and vetting of structural design and drawings of Navin's Starwood Towers-PH-3 (1B+stilt+21 storey) residential building at Vengaivasal, Chennai	14 July 2020	13 July 2021
56	IC	IC2021CE176SIMS008169	Nageswara Rao B	SATRA Infrastructure Management Services Limited	Vetting of bridge inspection reports (147 nos.) prepared for M/s Himachal Pradesh PWD	8 July 2020	7 July 2021
57	IC	IC2021CE174TPIN002776	Meher Prasad A	Teemage Builders Private Limited	Proof checking of structural design of permanent campus of phase 1 for IIIT at Trichy	9 June 2020	9 June 2021
58	CR	CR2021CE156ZOH0002795	Koshy Varghese; Co-PI: Arul Jayachandran S	Zoho Corporation Private Limited	Fabrication and commissioning of prefabricated doffing rooms for CHMC for COVID-19	1 July 2020	30 September 2020
59	CR	CR2021CE154SATR002795	Koshy Varghese; Co-PI: Arul Jayachandran S	Sai Trust	Fabrication and commissioning of prefabricated doffing rooms for CHMC for COVID-19	1 July 2020	30 September 2020
60	IC	IC2021CE158KRIE008111	Apparao G	M/s Krishi Infratech	Vetting of structural design and drawing for construction of two-lane ROB and its approaches LC. No. 88 between Kurabalakota - Madanapalli NH-340 in Andhra Pradesh	15 June 2020	31 December 2020
61	IC	IC2021CE159CRNA005002	Sathish Kumar S R	C R Narayana Rao Consultants Pvt. Limited	Proof checking design of CISF and ISRO buildings at Bangalore	1 July 2020	3 March 2021
62	IC	IC2021CE160TIDE005034	Alagusundaramoorthy P	Tidel Park Limited	Review of the analysis and design of the proposed Tidel Park building at Pattabiram	1 July 2020	31 December 2020

63	IC	IC2021CE161DPWR005034	Alagusundaramoorthy P	DP World Chennai	Damage assessment and repair and rehabilitation of ship damaged portion in CCTPL at Chennai Port	1 July 2020	31 December 2020
64	IC	IC20210260CEDRDO008165	Veeraragavan A	Defence Research and Development Organisation	Rehabilitation of test track for creation of Automotive and Weapon Testing Centre at CVRDE, Avadi	25 June 2020	24 September 2020
65	IC	IC20210291CECPCD008169	Nageswara Rao B	Central Government Postal Civil Division	Condition assessment of Packet Sorting Office (PSO) Building, Kannel Lane, Egmore, Chennai 600008	14 August 2020	13 August 2021
66	IC	IC20210293CEGARR008169	Nageswara Rao B	Garrison Engineer	Structural audit of buildings at Coast Guard Residential Area Ragamaliga at Mogappair, Chennai	14 August 2020	13 August 2021
67	IC	IC20210294CEGARR008169	Nageswara Rao B	Garrison Engineer	Structural audit of Main Workshop Building at Indian Coast Guard Base Maintenance Unit, Chennai	14 August 2020	13 August 2021
68	IC	IC20210320CETSCB002777	Boominathan A	Tamilnadu Slum Clearance Board	Geotechnical investigation for construction of 1560 nos of tenements with G+4 floors type buildings at Murukkampattu and Thalavedu Project schemes at Tiruttani village, Tiruvallur district	23 July 2020	31 March 2021
69	IC	IC20210318CECVCC008169	Nageswara Rao B	Cherian Varkey Construction Company Private Limited	Proof checking and vetting of structural design and drawings of proposed construction of a bridge at Makkekadavu, connecting Makkekadvu Kavala and Udayanapuram Jn across Vembanadu Kayal in Alappuzha district	17 August 2020	16 August 2021
70	IC	IC20210328EURCC005002	Sathish Kumar S R	URC Construction Private Limited	Proof checking design structures for M/s URC Construction Private Limited	20 August 2020	20 March 2021
71	IC	IC20210331CEKRIE008111	Apparao G	M/s Krishi Infratech	Proof checking of structural design and drawings for construction of four-lane ROB along NH 367 in Karnataka	10 August 2020	9 January 2021
72	RB	RB20210334CETWML002786	Mohan S	Tamilnadu Waste Management Limited	Groundwater pollution assessment study due to hazardous waste landfill	20 August 2020	23 September 2021

73	IC	IC20210353CERCCP005034	Alagusundaramoorthy P	Ramalingam Construction Company Private Limited	Review of the analysis and design and vet the drawings of 513 multi-storey residential TNGRHS flats under Group-III in Mambalam village, Guindy taluk, Chennai	3 January 2020	2 January 2021
74	RB	RB20210359CEHEVE005034	Alagusundaramoorthy P; Co-PI: Sathish Kumar S R	Hevea Rubber Technologies Private Limited	Analysis and design and evaluation of elastomeric and metal bearings for infrastructure applications	24 August 2020	23 August 2022
75	IC	IC20210253CECAAI002776	Meher Prasad A	Creative Architect and Interiors	Proof checking of structural designs and drawings for construction of proposed office building for IOCL at Mogappair, Chennai	17 June 2020	17 June 2021
76	IC	IC20210329CEBPIL005002	Sathish Kumar S R	Berger Paints India Limited	Proof checking design structures for M/s Berger Paints Private Limited	15 August 2020	31 March 2021
77	IC	IC20210330CETPLT008169	Nageswara Rao B	Tata Projects Limited	Determination of properties of aggregates and designing of concrete mix	21 August 2020	20 August 2021
78	IC	IC20210319CESOLI002776	Meher Prasad A	Sobha Limited	Peer review of structural designs and drawings for precast structure of Wing 24 of Sobha Dream Acres	17 August 2020	16 July 2021
79	IC	IC20210277CELNTL002776	Meher Prasad A; Co-PI: Subhadeep Banerjee	Larsen & Toubro Limited	Third party proof checking of structural design/drawings for the construction of Assam cancer care hospitals at 18 locations in Assam - SCI campus	11 August 2020	11 August 2021
80	IC	IC20210258CEULCL005003	Devdas Menon	Ultratech Cement Limited	Dynamic load resistance test for Ultratech Power Grout NS-2 (2 million cycle) - 3 Nos	7 August 2020	28 February 2021
81	RB	RB20210255CESAIN005036	Ligy Philip	Saint-Gobain India Private Limited (Research & Development)	Water filtration performance of Saint-Gobain ceramic membranes	4 August 2020	31 May 2021
82	IC	IC20210390CEKPWD008111	Apparao G	Karnataka Public Works Department	Proof checking of the design of Karnataka Bhavan, New Delhi	3 August 2020	30 June 2021
83	IC	IC20210419CEMBEL008436	Arul Jayachandran S	M&B Engineering Limited	Proof checking the design of PEBs for M/s Zyduz Health Care Limited	25 September 2020	1 October 2020

84	IC	IC20210420CELNLT008100	Manu Santhanam; Co-PIs: Piyush Chaunsali, Radhakrishna G Pillai, Ravindra Gettu	Larsen & Toubro Limited	Concrete materials for use in Ayodhya Ram Mandir	16 September 2020	31 December 2020
85	IC	IC20210415CENBCC008169	Nageswara Rao B	NBCC (INDIA) LIMITED	Consultancy services for proposed construction of multi-storey commercial space for UIIC building at White Road, Chennai	23 September 2020	22 September 2021
86	RB	RB20210400CERAMK002786	Mohan S; Co-PI: Robinson R G	Ramky Enviro Engineers Limited	Stability analysis and liner integrity in hazardous waste landfill facility	1 September 2020	31 December 2021
87	IC	IC20210387CELCW008554	Venu Chandra	L&T Construction, Water and Effluent Treatment IC	Vetting and approval of mechanical drawings and documents, surge analysis pertaining to Shivhar WSP, Uttar Pradesh	9 September 2020	31 May 2021
88	IC	IC20210388CELCW008554	Venu Chandra; Co-PI: Indumathi Manivannan Nambi	L&T Construction, Water and Effluent Treatment IC	Vetting of designs and drawings for water supply, recycled water supply with irrigation network, sewer network and storm water drainage network for HiTech Township at Mhalunge, Pune	9 September 2020	30 September 2021
89	IC	IC20210389CEAF0005002	Sathish Kumar S R; Co-PI: Alagusundaramoorthy P	Afcons Infrastructure Limited	Proof checking design of Mokama Bridge for Afcons	1 September 2020	31 December 2021
90	IC	IC20210395CESSPI008111	Apparao G	Structural Specialities and Projects India Private Limited	Proof checking of strengthening of column at Shamsahbad Airport	24 August 2020	20 February 2021
91	RB	RB20210428CEKDPL008344	Raghukanth S T G	DR Kelkar Designs Private Limited	SSS for the site of proposed buildings of JKP Foundation at Mangarh, UP	29 September 2020	1 January 2021
92	IC	IC20210429CEPEIP008671	Mathava Kumar S	Pollucare Engineers India Private Limited	Proof-checking the design of 180 KLD grey-water and 110 KLD black-water treatment plants based on MBBR technology	28 September 2020	15 November 2020
93	RC	RC20210406CESSC008405	Arun Menon; Co-PI: Phanisri Pradeep Pratapa, Manu Santhanam	Sree Shyam Sai Corporation Private Limited	Construction technology Advisory Board	21 September 2020	20 September 2021
94	IC	IC20210360CEWSIP002786	Mohan S	Water Systems India Private Limited	Adequacy check for proposed 300 KLD effluent treatment plant	3 August 2020	31 August 2021
95	IC	IC20210361CETWML002786	Mohan S	Tamilnadu Waste Management Limited	Environmental audit for hazardous waste landfill facility at Gummidipoondi	28 August 2020	30 September 2021

96	IC	IC20210375CEBGSC008111	Apparao G	B G Shirke Construction Technology Private Limited	Design of special concretes for Precast Construction Chennai Light House Project	1 September 2020	4 September 2024
97	IC	IC20210381CEDSSP008111	Apparao G	Deevin Seismic Systems Private Limited	Testing of bearings, anchorage efficiency and fatigue	1 September 2020	31 October 2021
98	IC	IC20210438CEPENN005002	Sathish Kumar S R	Pennar Engineering Building Systems Limited	Proof checking of structural design of PEBs	3 October 2020	31 March 2021
99	IC	IC20210464CEPCMS005003	Devdas Menon	M/s PCM Strescon Overseas Ventures Limited	Testing of prestress concrete mono block sleeper	15 October 2020	30 April 2021
100	IC	IC20210466CELNTL002776	Meher Prasad A	Larsen & Toubro Limited	Proof checking and certification for three span continuous superstructure and substructure located at Parade Ground of Hyderabad Metro Rail Project insisted by CMRS	5 October 2020	30 April 2021
101	IC	IC20210492CESMEC005003	Devdas Menon; Co-PI: Arul Jayachandran S	SMEC Rail India Private Limited	Proof checking of detailed design and drawings for Metro common alignment spans with MRTS between chainages 31240.605 to 31682.742m	27 October 2020	30 April 2021
102	IC	IC20210432CETNSB002777	Boominathan A	Tamilnadu Slum Clearance Board	Geotechnical investigation for construction of housing blocks (G+3) at Pallikaranai scheme (pockets 1 to 5)	11 September 2020	28 February 2021
103	IC	IC20210467CEESCP008436	Arul Jayachandran S	Eversendai Construction Private Limited	Proof checking the design of steel concrete composite tower at Taramani	19 October 2020	9 November 2020
104	IC	IC20210465CERCPL005003	Devdas Menon	Railtrack Concrete Products Private Limited	Design qualification test on dual gauge PSC sleepers as per EN-13230 and EN-1348	15 October 2020	30 April 2021
105	IC	IC20210441CELASA008436	Arul Jayachandran S	LEA Associates South Asia Private Limited	Consultancy services for preparation and approval of detailed design and drawing of various standard spans of ROB with standard deck configuration of 4/6-lane divided carriageway	8 October 2020	30 October 2020
106	IC	IC20210436CELWIP008165	Veeraragavan A	Lancewood Infra Private Limited	Design of pavement for Tamilnadu Polymer Industries Park	1 October 2020	31 March 2021

107	IC	IC20210437CEZAMI005002	Sathish Kumar S R	Zamil Steel Buildings India Private Limited	Proof checking of structural design of PEB for Diversified, Parnika and St.Gobain	3 October 2020	31 March 2021
108	IC	IC20210490CEESEN005002	Sathish Kumar S R	Eskay Enterprises	Proof checking structural design of residential quarters for NSG	27 October 2020	16 March 2021
109	IC	IC20210545CERSGI005034	Alagusundaramoorthy P	Royal Sundaram General Insurance Co. Limited	Failure analysis and stability check of retaining wall in the premises of DRA Adithya Chennai Homes LLP Building Complex at Kovilampakkam in Chennai	16 November 2020	15 February 2021
110	IC	IC20210519CECASA002786	Mohan S	Casa Grande Grace Private Limited	Vetting of the 620 KLD greywater and 340 KLD sewage treatment plant	5 November 2020	31 December 2021
111	RB	RB20210526CESAIN008926	Piyush Chaunsali	Saint-Gobain India Private Limited (Research & Development)	Performance evaluation of biomass ash-based binders for building applications	1 November 2020	1 May 2021
112	RC	RC20210502CESSSC008941	Phanisri Pradeep Pratapa	Sree Shyam Sayi Corporation Private Limited	Advisory inputs on interlocking brick mechanics, design, and analysis	12 October 2020	11 April 2021
113	IC	IC20210566CETSCB002776	Meher Prasad A	Tamil Nadu Slum Clearance Board Division III	Proof checking of structural designs and drawings for construction of 308 (S+11) tenements at Meenambal Sivaraj Nagar Scheme	23 November 2020	31 May 2021
114	IC	IC20210513CETNHB008111	Apparao G	Tamil Nadu Housing Board	Proof checking of structural design drawings of commercial complexes in Mambalam Village, Guindy, Chennai	19 September 2020	31 March 2021
115	IC	IC20210516CELTWCW008554	Venu Chandra	L&T Construction Water & Effluent Treatment IC	Vetting and approval of mechanical drawings and documents, surge analysis pertaining to Khatan WSS, Banda district, Uttar Pradesh	6 November 2020	31 March 2022
116	IC	IC20210529CETFIX002804	Rajagopal K; Co-PI: Amlan K Sengupta	Techfab (India) Industries Limited	Development of a geosynthetic facing connection system and evaluation through large-scale laboratory testing	14 September 2020	13 March 2021
117	IC	IC20210530CELTWCW002786	Mohan S; Co-PI: Sarathi R	L&T Construction Water and Effluent Treatment IC	Design checking of water and wastewater distribution network, treatment	13 November 2020	12 February 2021

118	IC	IC20210523CEDAEW008436	Arul Jayachandran S	Daewoo-L&T JV	Third party re-checking of two ROB spans for Bihar New Ganga Bridge Project	5 November 2020	18 November 2020
119	IC	IC20210524CESMCS005002	Sathish Kumar S R	M/s S M Consultants	Proof checking of DPR for structural drawings for various buildings at Chilka, including helipad	12 November 2020	12 May 2021
120	RB	RB20210565CEEPFL008100	Manu Santhanam; Co-PI: Radhakrishna G Pillai	Ecole Polytechnique Federale de Lausanne	Low Carbon Cement - Phase III	15 September 2020	14 September 2022
121	IC	IC20210555CEPEST008175	Murali Krishnan J	Puma Energy Supply and Trading Pte. Limited	Characterization of polymer modified binder testing	14 November 2020	13 November 2021
122	IC	IC20210589CETNHB008111	Apparao G	Tamil Nadu Housing Board	Proof checking of 56 HIG flats under SFS at Varaganeri, Trichy	1 December 2020	30 June 2021
123	IC	IC20210621CELTCW008204	Indumathi Manivannan Nambi	L&T Construction Water & Effluent Treatment IC	Proof checking of WTPS in Chitrakoot, MP (Situala Mustail and Chandi Bangar)	15 December 2020	30 June 2021
124	IC	IC20210629CENILD008344	Raghukanth S T G	Negolice India Limited	Site-specific spectra for the building site in Delhi	16 December 2020	16 May 2021
125	IC	IC20210630CERAIL008169	Nageswara Rao B	Rail Vikas Nigam Limited	Proof checking of design of sub-structure (typical pier and abutment) for Bridge Nos. 538/1, 538/2 & 538/3	16 December 2020	15 December 2021
126	IC	IC20210619CESSCL008169	Nageswara Rao B	Salem Smart City Limited	Proof checking of structural design and drawings of proposed grade separator of Old Bus Stand in Salem City Municipal Corporation	14 December 2020	13 December 2021
127	IC	IC20210578CEGARR008169	Nageswara Rao B	Garrison Engineer Tirunelveli	Consultancy services for carrying out structural survey of certain buildings at INS Kattabomman	30 November 2020	28 February 2021
128	IC	IC20210585CETNHB008111	Apparao G	Tamil Nadu Housing Board	Vetting of 224 TNGRHS flats at District Revenue Officer Colony, Madurai	7 December 2020	30 June 2021
129	IC	IC20210586CETNHB008111	Apparao G	Tamil Nadu Housing Board	Vetting of 88 TNGRHS Flats A and B Type in Bus Stand Colony at Dindigul	7 December 2020	30 June 2021
130	IC	IC20210572CELTCW008554	Venu Chandra	L&T Construction Water and Effluent Treatment IC	Vetting and approval of mechanical drawings and documents, surge analysis pertaining to Prasi and Belawadh WSP, Uttar Pradesh	27 November 2020	31 May 2022



131	IC	IC20210573CECARB002786	Mohan S	Carborundum Universal Limited	Design check of multiple effective evaporator and agitated thin film dryer for achieving zero liquid waste	23 November 2020	31 August 2021
132	IC	IC20210574CELTWC008554	Venu Chandra	L&T Construction Water and Effluent Treatment IC	Construction of pipe water supply scheme in Silauta-Mustaki and Chandi-Bangar group of villages, pertains to Chitrakoot (district), Uttar Pradesh	27 November 2020	31 May 2022
133	IC	IC20210595CEVATE008671	Mathava Kumar S	VA Tech Wabag Limited	Process documents for improvement of water supply system in Bhagalpur Municipal Corporation (BWSP-02), Bihar - proof checking	1 December 2020	15 December 2020
134	IC	IC20210606CELNLT008405	Arun Menon; Co-PIs: Raghukanth S T G, Meher Prasad A, Subhadeep Banerjee	Larsen & Toubro Limited	Ayodhya Complex - geotechnical, structural and earthquake engineering	5 December 2020	31 December 2021
135	IC	IC20210642CEAFCO008169	Nageswara Rao B	Afcons Infrastructure Limited	Design qualification test for railway concrete sleeper-rail seat repeated load test (fatigue test for 2 million cycles)	23 December 2020	24 December 2021
136	IC	IC20210633CEIOCL002777	Boominathan A; Co-PI: Subhadeep Banerjee	Indian Oil Corporation Limited	Expert opinion on the geotechnical investigation report for the proposed Gross Root Terminal at Vallur, Chennai	20 December 2020	18 June 2021
137	IC	IC20210640CEMEGH008169	Nageswara Rao B	Megha Engineering and Infrastructures Limited	Proof checking of two RoBs for proposed construction of six-lane Vijayawada Bypass from Chinnaautupalli (design Ch 0.000) to Gollapudi (design Ch 30.000) in Vijayawada to Gundugolanu section of NH-16 in Andhra Pradesh	16 December 2020	15 December 2021
138	IC	IC20210660CECOTE002776	Meher Prasad A	Cobratecton Private Limited	Proof checking of 150 MLD desalination plant based on sea water reverse osmosis at Nemmeli, East Coast Road, Chennai	28 December 2020	30 June 2021
139	IC	IC20210575CEMKET008436	Arul Jayachandran S	Metalkarma Engineering Technologies Private Limited	Proof checking the design of space frame structure for M/s Ramco Cements for their Jayanthipuram Limestone shed, by M/s Metalkarma Engineering Technologies Private Limited	26 November 2020	2 December 2020

140	IC	IC20210576CETECP008554	Venu Chandra	Tecton Engineering and Construction (India) Private Limited	Vetting and approval of hydraulic calculations, GA drawings and documents, pertaining to 150 MLD sea water RO desalination plant, Nemmeli, Chennai	27 November 2020	31 May 2021
141	IC	IC20210603CEVALM008436	Arul Jayachandran S	Valmont Structures Private Limited	Design checking of double circuit tension/DE pole type PD+0, 3,6 m Ext.	7 December 2020	14 December 2020
142	IC	IC20210618CEAADI005002	Sathish Kumar SR	Arkie Atelier Design India (Private) Limited	Proof checking of construction of new boys' hostel building at NITK Surathkal	12 December 2020	31 May 2021
143	IC	IC20210756CECPWD008321	Rupen Goswami	Central Public Works Department Division No II Pondicherry	Regional Cancer Centre, JIPMER, Puducherry	1 January 2021	30 November 2021
144	IC	IC20210730CECPWD008321	Rupen Goswami	Central Public Works Department Division No II Pondicherry	Hangar building and dispersal for CGAE, Puducherry	1 December 2020	31 July 2021
145	RB	RB20210726CEJNPT008251	Shiva Nagendra S M	Jawaharlal Nehru Port Trust	Real time air quality monitoring and environmental management system For Jawaharlal Nehru Port	15 January 2021	14 January 2024
146	IC	IC20210681CEGARR005036	Ligy Philip	Garrison Engineer West Jabalpur	Vetting of process design and hydraulic profiles of four proposed STPs in Jabalpur Cantonment Area	1 January 2021	31 May 2021
147	IC	IC20210738CEAIRX008169	Nageswara Rao B	Prasar Bharati Broadcasting Corporation of India	Consultancy services for structural analysis of four DD towers in AIR/DDK at Shimoga, Raichur, Hubli-Dharwad and Vellore	1 January 2021	31 December 2021
148	IC	IC20210743CELNTL002786	Mohan S; Co-PI: Krishna Moorthy Sivalingam	Larsen & Toubro Limited	Development of hydraulic design software - Phase I	7 January 2021	6 May 2021
149	IC	IC20210721CELNTL008588	Benny Raphael; Co-PI: Koshy Varghese	Larsen & Toubro Limited	Proof checking of enabling structures - Tallah ROB	7 January 2021	7 March 2021
150	IC	IC20210677CENAME008175	Murali Krishnan J	NAM Expressway Limited	Mechanical characterization of recycled asphalt pavement materials	21 December 2020	20 June 2021
151	IC	IC20210678CELNTL002776	Meher Prasad A	Larsen & Toubro Limited	Proof checking of structural design drawings for the construction of teaching hospital at Flacq, Mauritius	28 December 2020	3 September 2021

152	IC	IC20210754CETPLT008169	Nageswara Rao B	Tata Projects Limited	Determination of properties of aggregates and designing of concrete mix	13 January 2021	12 January 2022
153	IC	IC20210766CECPCL002786	Mohan S	Chennai Petroleum Corporation Limited	Ambient air quality and stack emission monitoring at CPCL	25 January 2021	31 January 2022
154	IC	IC20210767CETWML002786	Mohan S; Co-PI: Robinson R G	Tamil Nadu Waste Management Limited	Design checking and construction monitoring of Cell 8 - Hazardous Waste Landfill Facility at Gumidipoondi	1 January 2021	31 March 2022
155	IC	IC20210768CETPLT008344	Raghukanth S T G	TATA Projects Limited	Site-specific spectrum for Majuli-Jorhat Bridge, Assam	18 January 2021	1 May 2021
156	IC	IC20210763CETNUI008310	Balaji Narasimhan; Co-PI: Murty B S, Soumendra Nath Kuiry	Tamil Nadu Urban Infrastructure Financial Services Limited	Supervisor consultancy of the consultant cum system integrator for the consulting services for planning, setting up and operationalising a real time flood forecasting and spatial decision support system for Chennai Basins	16 December 2020	16 March 2023
157	IC	IC20210724CEDMIA008554	Venu Chandra	DMIA NYATI LLP	Proof checking of hydrology calculations and reports in connection to eight-lane Delhi-Vadodara Expressway	11 January 2021	31 March 2022
158	IC	IC20210757CEMRHI005003	Devdas Menon	M.R. HI-Tech Engineers Private Limited	Reconstruction of existing ROB at Km 113/4 of construction of grade separator at Km 113/8 of NH-4 (Chennai-Chittoor-Bangalore) in Tamil Nadu—proof checking of design and drawing	4 January 2021	31 July 2021
159	IC	IC20210679CELNTG002776	Meher Prasad A	L&T Geosturcture LLP	Proof checking for construction of HL bridge over river Subarnarekha at 36th km on Haldipada NH-16 to West Bengal border via Baliapal, Pantel and Chandaneswar, including approaches in the district of Balasore, Odisha	28 December 2020	30 June 2021
160	IC	IC20210748CELCW008204	Indumathi Manivannan Nambi	L&T Construction Water & Effluent Treatment IC	Vetting of design documents of 30 MGD STP at Diggian, Chandigarh	10 January 2021	30 June 2021
161	RB	RB20210714CEKIAS008961	Chandan Sarangi	Kathmandu Institute of Applied Sciences	Influence of transboundary air pollutants into the atmosphere of Kathmandu, Nepal	1 October 2020	30 September 2022

162	ET	ET20210733CEAAA008327	Vidya Bhushan Maji	Common Code	Laboratory testing on rocks (common code project - Phase 2)	1 January 2021	31 December 2023
163	IT	IT20210734CEAAA008327	Vidya Bhushan Maji	Common Code	Laboratory testing on rocks (common code project - Phase 2)	1 January 2021	31 December 2023
164	IC	IC20210920CETNHB008111	Apparao G	Tamilnadu Housing Board Besant Nagar	Proof checking of multistoried office cum commercial complex	3 February 2021	31 December 2021
165	IC	IC20210776CELNTL008344	Raghukanth S T G	Larsen & Toubro Limited	Site-specific spectra for Dhubri site	18 January 2021	1 April 2021
166	IC	IC20210896CELCW008554	Venu Chandra	L&T Construction Water and Effluent Treatment IC	Execution of rural piped water supply projects pertaining to Attabira, Bargarh, 1 Nos. G.P of Barpali, Bijepur and Gaislet block of Bargarh district, including five years' operation and maintenance	9 February 2021	31 December 2022
167	IC	IC20210886CELCW008204	Indumathi Manivannan Nambi	L&T Construction Water and Effluent Treatment IC	Vetting of design and drawing of WW network @ Delhi Kirari	16 December 2020	31 December 2021
168	RB	RB20210900CEHSRI008661	Atul Narayan SP; Co-PIs: Manu Santhanam, Murali Krishnan J, Subhadeep Banerjee	High Speed Railways Innovation Center Trust	Indigenous development of cement asphalt mortar (CAM) for high-speed railway track	2 February 2021	31 January 2023
169	RB	RB20210898CEPOIP008344	Raghukanth STG	P-One Infrastructure Private Limited	Seismic hazard of Ocean Towers' site	12 February 2021	11 August 2021
170	RB	RB20210906CEWCIP008952	Surender Singh	Westart Communications India Private Limited	R&D of construction debris	12 January 2021	31 December 2022
171	IC	IC20210915CEMACA002804	Rajagopal K	Maccaferri Environmental Solutions Private Limited	Proof checking and approval of designs for soil support systems at Mopa Airport, Goa	1 January 2021	31 December 2021
172	IC	IC20210917CEICIL005002	Sathish Kumar SR	Indian Commerce and Industries Company Private Limited	Proof checking structural design of PEBs for Sundaram Fasteners and Shri Kailash	10 February 2021	10 August 2021

173	IC	IC20210865CESRMIO08169	Nageswara Rao B	SRM Institute of Science & Technology	Proof checking and vetting the prepared structural design drawing and providing the study report to construct the RCC cast in situ structure above the precast structure of College Hostel Block G+4 for TRP Engineering College, Tiruchirappalli 621105	25 January 2021	21 January 2022
174	IC	IC20210866CEKELLO08160	Robinson R G; Co-PI: Subhadeep Banerjee	Keller Ground Engineering India Private Limited	Proof checking of ground improvement works using stone columns for mounded type pressure vessels, IOCL, Ennore	15 January 2021	14 December 2021
175	IC	IC20210876CERDSCO08169	Nageswara Rao B	RDS-CVCC (JV)	Witnessing, certifying and furnishing the load test report by IIT Madras team as part of carrying out pre-commissioning test of two-lane Alappuzha bypass from KM 408+100 to 414+900 on NH-47, Kerala	14 January 2021	13 January 2022
176	IC	IC20210871CEKELLO08160	Robinson R G; Co-PI: Subhadeep Banerjee	Keller Ground Engineering India Private Limited	Proof checking of vibro-stone column at IOCL-Paradip	27 January 2021	20 January 2022
177	IC	IC20210772CEKAMR008554	Venu Chandra; Co-PI: Nageswara Rao B	Kamarajar Port Limited	Design of pump capacity and structural design of sump to drain the rainwater	11 January 2021	31 December 2021
178	IC	IC20210868CEERSCO02786	Mohan S	Erode Smart City Limited	Erode City Municipal Corporation - Proof checking for design of incinerator	1 February 2021	31 August 2021
179	RB	RB20210770CENLCL002786	Mohan S	Neyveli Lignite Corporation India Limited	Estimation of subsidence due to mining in NLCIL Neyveli region using remote sensing SAR interferometry study	1 January 2021	1 January 2022
180	IC	IC20210779CEERSCO02786	Mohan S	Erode Smart City Limited	Checking evaluation for design of Perumpallam Odai Retaining Wall	1 January 2021	31 August 2021
181	IC	IC20210862CECOAS008478	Subhadeep Banerjee; Co-PI: Boominathan A	Coastal Marine Construction & Engineering Limited	Geotechnical consultancy for Kalpasar Dam project	1 February 2021	1 February 2022
182	IC	IC20210913CELTCW008111	Apparao G	Larsen & Toubro Limited Construction Water and Effluent Treatment IC	Proof checking and approval of civil and structural design and drawing for Kirari Sewer Scheme Project, Delhi	15 January 2021	18 December 2021

183	IC	IC20210909CEHUDC008327	Vidya Bhushan Maji; Co-PI: Boominathan A	HUDCO Limited	Geotechnical investigation and recommendation on foundation design	15 February 2021	14 February 2022
184	IC	IC20210911CEKECI008554	Venu Chandra	KEC International Limited	Vetting and approval of hydraulic, mechanical drawings and documents, surge analysis pertaining to Bheden and Barpali Block WSS of Bargarh district, Odisha	15 February 2021	31 December 2022
185	IC	IC20210883CEINKE008436	Arul Jayachandran S	INKEL Limited	Proof checking the structural design and drawings of New Hospital Block of Government Medical College Ernakulam	4 February 2021	18 February 2021
186	IC	IC20210851CEDSSP008111	Apparao G	Deevin Seismic Systems Private Limited	Anchorage efficiency and load transfer	11 January 2021	31 March 2021
187	RB	RB20210893CELFA008190	Ravindra Gettu; Co-PI: Piyush Chaunsali	Lafarge Centre De Recherche	Development of binders for e-glass reinforcement	1 January 2021	31 December 2024
188	IC	IC20211020CESPSC008111	Apparao G	S P Singla Constructions Private Limited	Studies on fatigue strength of HT strands	1 March 2021	31 March 2022
189	IC	IC20210934CETNHB005002	Sathish Kumar S R	Tamil Nadu Housing Board	Proof checking of RCC building for Tamil Nadu Housing Board at Hosur	20 February 2021	20 August 2021
190	IC	IC20210935CEPWX008478	Subhadeep Banerjee; Co-PIs: Arun Menon-008405, CE Boominathan A-002777, CE	Public Works Department	Impact assessment study of PWD main building	23 February 2021	28 February 2022
191	RB	RB20210939CEUCIP005034	Alagusundaramoorthy P; Co-PI: Sathish Kumar S R-005002, CE	Unitech Couplers India Private Limited	Technical guidance and expert opinion on manufacturing of neoprene bearing pads and pot-cum-PTFE bearings	20 January 2021	19 January 2023
192	IC	IC20210940CETDIS005034	Alagusundaramoorthy P	Three D Integrated Solutions Limited	Review of the analysis and design of RESS and design of foundation for RESS	4 February 2021	3 May 2021
193	IC	IC20210941CETARM008661	Atul Narayan S P; Co-PI: Veeraragavan A-008165, CE	Tarmat Limited	Mix design for overlays for the secondary runway at Chennai airport	1 February 2021	31 January 2023
194	IC	IC20210942CENCL005034	Alagusundaramoorthy P	NCC Limited	Review of the connection design and drawings and shop drawings of the proposed Main Building in Chennai Trade Centre	10 February 2021	9 February 2022

195	IC	IC20210948CEEPEP005034	Alagusundaramoorthy P	Eco Protection Engineers Private Limited	Review of the structural design calculation and drawing of 21.85MLD capacity sewage treatment plant construction project for Rajapalayam City Municipal Corporation in Tami Nadu	19 August 2020	18 August 2021
196	IC	IC20210951CEAEDB002776	Meher Prasad A	AEDBM Consultants Private Limited	Proof checking of classified DRDO project	22 February 2021	30 April 2021
197	IC	IC20210949CECPWD005034	Alagusundaramoorthy P	Central Public Works Department	Condition assessment of the existing Administrative building block, auditorium and laboratory blocks at the Regional Labour Institute in Chennai	11 January 2021	10 July 2021
198	IC	IC20210957CECPWD005034	Alagusundaramoorthy P	Central Public Works Department	Analysis and design of international hostel and Academic Block at CSIR-Central Leather Institute at Adyar in Chennai	26 December 2020	25 April 2021
199	IC	IC20210950CEEPIL005034	Alagusundaramoorthy P	Engineering Projects India Limited	Condition assessment and repair and rehabilitation of TNSCB Building at Perumbakkam in Chennai	27 February 2021	26 February 2022
200	IC	IC20210952CEEHRD008169	Nageswara Rao B	Emerald Haven Realty Developers (Paraniputhur) Private Limited	Review the structural design of building and provide stability certificate for Green Enclave near Porur	4 March 2021	3 March 2022
201	RB	RB20210955CEUAS005036	Ligy Philip	University of Applied Sciences Dresden	CCRBF - Expansion of the Indo-German Competence Centre for Riverbank Filtration	1 July 2020	30 June 2023
202	IC	IC20210956CETNHB005034	Alagusundaramoorthy P	Executive Engineer, Foreshore Estate Division, Tamilnadu Housing Board	Review of the analysis and design and vet the drawings of the proposed multi-storeyed office cum commercial complex in Peter's Road Colony of Mylapore village at Mylapore taluk in Chennai district	29 January 2021	28 January 2022
203	RB	RB20210970CEJNPT008251	Shiva Nagendra S M	Jawaharlal Nehru Port Trust	Real time monitoring system of marine water and sewage treatment plant with environmental assessment of water quality for JNPT	18 March 2021	17 January 2024
204	RB	RB20210971CEIGCA008344	Raghukanth S T G	Indira Gandhi Centre for Atomic Research	Simulation of beyond design basis ground motion for Kalpakkam	22 January 2021	21 January 2022

205	RB	RB20210975CEIRRG008566	Soumendra Nath Kuiry; Co-Pls: Sannasiraj S A-008117, OE; Murty B S-005017, CE; Balaji Narasimhan-008310, CE; Sudheer K P-008121, CE	Irrigation Department, Government of Kerala	Hydrodynamic study for the scheme- Kuttanad package-Flood management programme- Development of the Thottappally leading channel	1 March 2021	28 February 2022
206	IC	IC20210983CELTCW008554	Venu Chandra	L&T Construction Water and Effluent Treatment IC	Execution of rural piped water supply projects of Rajghat Dam Multi-Village Scheme pertaining to Ashoknagar and Guna districts	10 March 2021	31 December 2023
207	IC	IC20211007CENBCC008459	Radhakrishna G Pillai	NBCC (India) Limited	Design of cathodic protection systems for reinforced concrete buildings	12 March 2021	30 September 2021
208	IC	IC20210995CENCL008952	Surender Singh; Co- Pls: Ramesh Kannan Kandasami-008953, CE; Atul Narayan S P-008661, CE	NCC Limited	Resurfacing of runway and taxi track at INS Rajali - Arakkonam	15 March 2021	14 March 2022
209	IC	IC20211011CELNTL002776	Meher Prasad A	Larsen & Toubro Limited	Construction of EWS and LIG houses and infrastructure works for CIDCO at Bamandongri, Kharkopar Station West, Kharkopar Station East, Taloja Sector 39, Navi Mumbai	15 March 2021	30 September 2021
210	IC	IC20211032CEURCC005002	Sathish Kumar S R	URC Construction Private Limited	Proof-checking of RCC buildings for JIPMER Medical College Karaikal	10 March 2021	10 September 2021
211	IC	IC20211019CELTCW008554	Venu Chandra	L&T Construction Water and Effluent Treatment IC	Construction of Gond Deosar Multi-Village Rural Water Supply Scheme for villages in Singrauli district of Madhya Pradesh	17 March 2021	31 May 2023
212	IC	IC20211024CELTCW008554	Venu Chandra	L&T Construction Water and Effluent Treatment IC	Vetting and approval of mechanical drawings and documents, surge analysis pertaining to Agar Malwa Multi-Village Scheme, district Agar Malwa, Madhya Pradesh	16 March 2021	31 May 2023
213	IC	IC20211025CERILD008169	Nageswara Rao B	Royal Infraconstru Limited	Proof-checking and vetting the design/ drawings of composite steel girders 30.5m, 18.3m and 12.2m spans	23 March 2021	22 March 2022



214	IC	IC20211030CERRTB008671	Mathava Kumar S	R R Thulasi Builders India Private Limited	Vetting the design calculations of three MLD STP at Valankulam Lake, Coimbatore	17 March 2021	31 May 2021
215	IC	IC20211040CEURCC002776	Meher Prasad A	URC Construction Private Limited	Proof-checking of redevelopment of Birsa Munda Stadium and construction of multilevel carparking project	13 December 2019	13 December 2021
216	IC	IC20211029CESIKA005003	Devdas Menon	Sika India Private Limited	Testing of cementitious Grout (SIKA Grout - 214IN)	15 March 2021	30 September 2021
217	IC	IC20211039CELCW008554	Venu Chandra	L&T Construction Water and Effluent Treatment IC	Vetting and approval of mechanical drawings and documents pertaining to Madikheda Multi-Village Scheme, district Shivpuri, Madhya Pradesh	18 March 2021	31 May 2023
218	IC	IC20211044CEUPJN008327	Vidya Bhushan Maji; Co-PI: Boominathan A-002777, CE	Construction and Design Services, UP Jal Nigam	Site inspection and to provide suitable selection of foundation for the structure of proposed girls' hostel at Karaikal Campus, Pondicherry University, Puducherry	12 March 2021	7 March 2022
219	IC	IC20211036CEASBL008169	Nageswara Rao B	Ashoka Buildcon Limited	Proof-checking and vetting of structural design and drawings of proposed construction of RoB at kM 2/100-2/200 (NH kM 153+213)	25 March 2021	24 March 2022
220	IC	IC20211045CELNTL002776	Meher Prasad A	Larsen & Toubro Limited	Proof-checking for the design and engineering service for the blast resistant design of substation buildings in KNPC project	29 March 2021	30 September 2021
221	IC	IC20211056CELCW008566	Soumendra Nath Kuiry	L&T Construction Water & Effluent Treatment IC	Consultancy services for vetting of basic engineering package (BEP), hydraulic calculations, GA drawings of PH, DC and BPT, LS drawings, and surge analysis report of Garhwa Lift irrigation project	10 February 2021	6 May 2021
222	IC	IC20211055CELCW008566	Soumendra Nath Kuiry	L&T Construction Water & Effluent Treatment IC	Surge analysis for wastewater pumping main of STP in Kirari, Delhi	28 December 2020	7 May 2021
223	IC	IC20211058CESKIP008436	Arul Jayachandran S	Skipper Limited	Proof-checking of eight towers for M/s Skipper Limited	10 March 2021	23 March 2021

## 4.7. Department of Computer Science and Engineering

### 4.7.1. Introduction

Started as the Computer Centre in 1973, the Department of Computer Science and Engineering was established as a full-fledged department in 1983. The department has a vibrant student body of around 620 students and 30 faculty members. About 60% of students are postgraduates, mostly supported

by Government of India scholarships and research projects. The department also offers several attractive industry-sponsored fellowships for outstanding Ph.D. scholars. The vision of the CSE Department is “global excellence and local relevance” in research, teaching, and technology development in computer science and engineering.

### 4.7.2. Academic Programmes

B.Tech., Dual Degree (B.Tech. and M.Tech.), M.Tech., M.S., Ph.D., Dual M.S./Ph.D., Dual M.Tech./Ph.D.; Inter-disciplinary Dual Degree in Data Science (B.Tech/M.Tech).

#### New discipline/branch introduced

Minor stream on Artificial Intelligence and Machine Learning

#### New courses introduced

S. No.	Course No.	Title
1	CS6225	Programs and Proofs
2	CS6650	Smart Sensing for Internet of Things
3	CS7260	Post-Quantum Cryptography
4	CS6235	Analysis of Parallel Programs
5	CS6741	Statistical Foundations of Data Science
6	CS6240	Structural Graph Theory

#### Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	87	81	71	44	6	289
Dual Degree	-	-	2	19	16	37
M.Tech.	70	61	2	0	1	134
M.S.	30	19	23	5	1	78
Ph.D.	20	7	17	12	8+6+8+9=31	87
Total	207	168	115	80	55	625

**Student/Scholar who attended conferences/seminars/symposia abroad/India**

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposia/Workshop	Date and Venue	Financial Assistance from
<b>Abroad</b>					
1	Sadbhavana Babar	CS18S029	WACV	January 2021 (virtual)	IITM
2	Keerthi K	CS17D013	CHES	September 2020	IITM
3	Muhammad Arsath	CS16S035	IEEE HOST	December 2020	IITM
4	Girija Limaye	CS17D006	SAGT	September 2020 (virtual)	
5	Barath Ashok	CS17S029	SIROCCO	July 2020 (virtual)	
<b>India</b>					
1	Ebenezer Rajadurai	CS20D012	Principles and Practice of Parallel Programming (PPoPP)	27 February-3 March 2021, online	Project
2	Ashwina Kumar	CS20D016	PPoPP	27 February-3 March 2021, online	Project
3	Joe Augustine	CS16S031	International Conference on Computer Design	18-21 October 2020, online	Institute
4	Aman Nougrihiya	CS12D023	Code Generation and Optimization	27 February-3 March 2021	Project
5	Brintha VP	CS18D017	ISMB 2020 (Annual International Conference on Intelligent Systems for Molecular Biology), virtual	13-16 July 2020	Project
6	Sugyani Mahapatra	CS18D015	GCLR workshop at AAAI 2021, virtual	9 February 2021	Project
7	Jadhav Aditya Dinkar	CS18M023	ICML workshop on Computational Biology 2020, virtual	17 July 2020	Project

**Students/Scholars who won outside prizes and awards**

S. No.	Student/Scholar	Roll No.	Prize	Prize awarded by
1.	Monosij Maitra	CS15D010	IBM Best Thesis Award	IBM
2.	Muhammad Arsath	CS16S035	Best paper at IEEE HOST 2020	HOST conference
3.	Ayalur V. Lakshmy	cs16b101	Qualcomm Innovation Fellowship	QIF
4.	Tarun Kumar	CS15D017	Intel India Fellowship for year 2020-21	Intel
5.	Gargi Mitra	CS15D303	First prize, Applied Research Contest CSAW 2020	NYU and IIT Kanpur

6.	Patanali SLPSK	CS12D024	Second prize, Applied Research Contest CSAW 2020	NYU and IIT Kanpur
7.	Keerthi K.	CS17D013	Third prize, Applied Research Contest CSAW 2020	NYU and IIT Kanpur
8.	Keerthi K.	CS17D013	First prize, PhD forum at SPACE 2020	SPACE Conference
9.	Harshavardhan P. K.	CS15B061	Best Paper Runner Up, AAMAS 2020	AAMAS Conference

### 4.7.3. Faculty and Their Specialisations

#### Faculty

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Chandra Sekhar C., Ph.D. (IIT Madras) <b>(Head)</b>	Kernel methods, deep learning, metric learning
Deepak Khemani, Ph.D. (IIT Bombay)	Artificial intelligence, knowledge-based systems, natural language
Hema A. Murthy, Ph.D. (IIT Madras)	Processing and neural networks
Janakiram D., Ph.D. (IIT Delhi)	Speech technology, music analysis, pattern recognition, signal processing and machine learning, computational brain research
Kamakoti V., Ph.D. (IIT Madras)	Object-oriented systems, software engineering, parallel and distributed systems, database systems, mobile computing, computing education, computing for developing regions, mobile telemedicine
Krishna Moorthy Sivalingam, Ph.D. (SUNY Buffalo, USA)	Software For VLSI design, computational geometry, high-performance computing
Pandu Rangan C., Ph.D. (IISc, Bengaluru)	Wireless networks, optical networks, computer networks
Siva Ram Murthy C., Ph.D. (IISc, Bengaluru)	Algorithms, parallel and VLSI algorithms, graph theory, computational geometry, randomized algorithms, computational learning theory, crypto-analysis
Sreenivasa Kumar P., Ph.D. (IISc, Bengaluru)	Parallel and distributed computing, real-time systems, wireless networks
Sukhendu Das, Ph.D. (IIT Kharagpur)	Database systems, applied ontologies
Madhu Mutyam, Ph.D. (IIT Madras)	Computer vision, visual perception, image intelligence, graphics and visualization
Narayanaswamy N.S., Ph.D. (IISc, Bengaluru)	Computer architecture
Anurag Mittal, Ph.D. (University of Maryland, USA)	Algorithms, complexity theory, artificial intelligence
Ravindran B., Ph.D. (University of Massachusetts, Amherst, USA)	Computer vision, pattern recognition and image understanding
V. Krishna Nandivada, Ph.D. (University of California, Los Angeles, USA)	Reinforcement learning, artificial intelligence compilers, program analysis, programming languages, high performance computing

Name and Qualifications	Major Areas of Specialisation
<b>Associate Professors</b>	
Sutanu Chakraborti, Ph.D. (The Robert Gordon University, UK)	Information retrieval, memory-based reasoning, machine learning
Jayalal Sarma M.N., Ph.D. (Institute of Mathematical Sciences, Chennai)	Computational complexity theory, circuit complexity, algebra and computation
John Augustine, Ph.D. (University of California, Irvine, USA)	Distributed algorithms, security in distributed computing, randomized algorithms
Manikandan Narayanan, Ph.D. (University of California at Berkeley, USA)	Bioinformatics, computational network biology, systems biology/genomics in health and disease, network models and graph algorithms, data science
Raghavendra Rao B.V., Ph.D. (Institute of Mathematical Sciences, Chennai)	Computational complexity theory, algebraic complexity, combinatorial commutative algebra, descriptive complexity theory
Rupesh Nasre, Ph.D. (IISc, Bengaluru)	Compilers, parallelization, program analysis
Shweta Agrawal, Ph.D. (University of Texas, Austin, USA)	Cryptography, security, theoretical computer science
Chester Rebeiro, Ph.D. (IIT Kharagpur)	Hardware and system security, side-channel analysis, cryptography, computer architecture, operating systems, VLSI
Mitesh Khapra, Ph.D. (IIT Bombay)	Deep learning, natural language processing, question answering, multimodal multilingual conversation systems
<b>Assistant Professors</b>	
Meghana Nasre, Ph.D. (IISc, Bengaluru)	Algorithms, graph theory, matching algorithms
L.A. Prashanth, Ph.D. (IISc, Bengaluru)	Reinforcement learning, stochastic optimization, multi-armed bandits
Yadu Vasudev, Ph.D. (Institute of Mathematical Sciences, Chennai)	Algorithms, especially sub-linear algorithms and computational complexity theory
Harish Guruprasad, Ph.D. (IISc Bengaluru)	Machine learning, learning theory and optimisation
Pratyush Kumar, Ph.D. (ETH, Zurich, Switzerland)	Cyber-physical systems, machine learning
K C SivaramaKrishnan, Ph.D. (Purdue University, USA)	Programming languages, distributed systems, parallel compilers and runtime systems
Arun Rajkumar, Ph.D. (IISc Bengaluru)	Machine learning, statistical learning, sequential decision making
Kartik Nagar, Ph.D. (IISc Bengaluru)	Automated program verification, program analysis, programming languages

Name and Qualifications	Major Areas of Specialisation
Nishad Bharat Kothari, Ph.D. (University of Waterloo, Canada)	Graph theory, matching theory, combinatorial optimization
Ayon Chakraborty, Ph.D. (State University of New York, Stony Brook, USA)	Networked systems, mobile computing, wireless sensing
Akanksha Agrawal, Ph.D. (University of Bergen, Norway)	Parameterized algorithms, graph algorithms, computational geometry
<b>Adjunct Faculty</b>	
Ravishankar Krishnaswamy, Microsoft Research India, Bangalore	Approximation algorithms, online algorithms
Deepak Padmanabhan, Queen's University, Belfast	Data analytics, machine learning, similarity search
Sriraam Natarajan, The University of Texas at Dallas, USA	Artificial intelligence, machine learning, graphical models, relational learning
Manikantan Srinivasan, Veryx Technologies, Chennai	Data communication networks, network visualization, wireless LANs, cybersecurity
Sarath Chandar, Ecole Polytechnique de Montreal, Canada	Recurrent neural networks, lifelong learning, reinforcement learning, deep learning, natural language processing
<b>Visiting Faculty</b>	
Partha Mitra (Prof. Mahabala Distinguished Chair in Computational Brain Research), Cold Spring Harbor Laboratory, USA	Intelligent machines, brain-wide mesoscale circuit mapping
Mriganka Sur (N.R. Narayana Murthy Distinguished Chair in Computational Brain Research) Massachusetts Institute of Technology, USA	Cortical development and plasticity, dynamics, brain disorders
David Peleg (Venky Harinarayan and Anand Rajaraman Visiting Chair) Weizmann Institute of Science, Israel	Algorithms, distributed computing, communication networks
Vyas Sekar (Venky Harinarayan and Anand Rajaraman Visiting Chair) Carnegie Mellon University, USA	Networking, security, systems
Shrikanth Narayanan (VAJRA Faculty) University of Southern California, USA	Speech and language processing, human behavioral signal processing, spoken dialog and multimodal systems, biomedical signal processing and modeling
Gopal Pandurangan (VAJRA Faculty) University of Houston, USA	Theoretical and algorithmic foundations of distributed computing, networks, large-scale data
Srinivasan Parthasarathy (VAJRA Faculty) The Ohio State University, USA	High performance data analytics, graph analytics and network science, machine learning, database systems

### Short-term courses/workshops/seminars/symposia/conferences organised by faculty members

S. No.	Coordinator(s)	Title	Period
<b>Workshops</b>			
1	Ashish Kuvelkar, Sharad Sinha, Sandeep Chandran, Somnath Roy, Rupesh Nasre	HPC Shiksha: Introduction to HPC	November 2020-February 2021
2	Himanshu Goyal, Kameswararao Anupindi, Ratna Kumar Annabattula, Rupesh Nasre, Santanu Ghosh, Sunetra Sarkar	NSM HPC Workshop	July 2020
3	Himanshu Goyal, Kameswararao Anupindi, Rupesh Nasre, Santanu Ghosh, Sunetra Sarkar	NSM Workshop on HPC in CFD	December 2020
4	Rupesh Nasre	Qualcomm Lecture Series	December 2020-January 2021
5	Ashish Kuvelkar, Sharad Sinha, Sandeep Chandran, Somnath Roy, Rupesh Nasre	AI Shiksha: Introduction to Machine Learning	March-May 2021
6	Ashish Kuvelkar, Sharad Sinha, Sandeep Chandran, Somnath Roy, Rupesh Nasre	NSM Workshop on Arm based HPC	March 2021
7	Shweta Agrawal, Satya Lokam	India Crypto Day	July 2020
<b>Short-term Course</b>			
1	V. Krishna Nandivada	Compiler Design	January 2021

### Short-term courses/workshops/seminars/symposia/conferences/trainings attended by the faculty members in academic institutions and public sector undertakings

S. No.	Faculty	Title	Institution	Period
<b>Workshops</b>				
1	Shweta Agrawal	New Developments in Obfuscation	Simons Institute, UC Berkeley	December 2020
2	Shweta Agrawal	India Crypto Day	IIT Madras	July 2020
3	Akanksha Agrawal	Parameterized Complexity 301	Online	December 2020
<b>Seminars</b>				
1	Nishad Kothari	Matching Theory: K4-based and prism-based planar graphs	Ashoka University	September 2020
2	Nishad Kothari	The Many Colors of Combinatorics	Gonit Sora (mathematics magazine and organisation)	August 2020

Conferences				
1	Shweta Agrawal	Eurocrypt 2020	Online	11-15 May 2020
2.	Shweta Agrawal	Theory of Cryptography Conference	Online	16-19 November 2020
3	Shweta Agrawal	Asiacrypt 2020	Online	7-11 December 2020
4	Sutanu Chakraborti	ICCBR 2020	Online	8-12 June 2020
5	Kartik Nagar	CAV 2020	Online	19-24 July 2020
6	KC Sivaramakrishnan	ICFP 2020	Online	24-26 August 2020
7	KC Sivaramakrishnan	APLAS 2020	Online	30 November-2 December 2020
8	KC Sivaramakrishnan	PADL 2021	Online	18-19 January 2021
9	V. Krishna Nandivada	ICS 2020	Online	29 June 2020 - 02 July 2020
10	V. Krishna Nandivada	HiPEAC 2021	Online	18-20 January 2021
11	V. Krishna Nandivada	CGO 2021	Online	27 February-3 March 2021
12	V. Krishna Nandivada	POPL 2021	Online	17-22 January 2021
13	Chester Rebeiro	TCHES	Online	September 2020
14	Chester Rebeiro	HOST	Online	December 2020
15	Chester Rebeiro	ASIAN HOST	Online	December 2020
16	Chester Rebeiro	SPACE 2020	Online	December 2020
17	Akanksha Agrawal	IPEC 2020	Online	December 2020
18	John Augustine	PODC 2020	Online	August 2020
19	John Augustine	SIROCCO 2020	Online	July 2020

### Special lectures delivered by the faculty in other institutions

S. No.	Faculty Member	Topic of Lecture	Institution	Date
1	Rupesh Nasre	Inheritance and Overloading	Raisoni College, Nagpur	July 2020
2	Rupesh Nasre	GPU Programming	NSM HPC Workshop	July 2020
3	Rupesh Nasre	Program Analysis	Raisoni College, Nagpur	August 2020
4	KC Sivaramakrishnan	Multicore OCaml – What's Coming in 2021	Nomadic Labs Research Seminar, Paris, France	December 2020
5	KC Sivaramakrishnan	Retrofitting Effect Handlers to OCaml	PLV Seminar, National University of Singapore	December 2020
6	KC Sivaramakrishnan	Effective Programming in OCaml	Lambda Days, 2021, Krakow, Poland	February 2021



7	Shweta Agrawal	iO via Functional Encryption: Techniques and Challenges from LWE	Simons Institute, UC Berkeley	11 December 2020
8	Shweta Agrawal	Optimal Broadcast Encryption from LWE and Pairings	ENS de Lyon	16 November 2020
9	Shweta Agrawal	Post Quantum Cryptography	Ashoka University	17 September 2020
10	Shweta Agrawal	Post Quantum Cryptography	Gonit Sora, Assam	10 October 2020
11	Krishna M. Sivalingam	IoT Security: Blockchain and Applications	SRM Institute of Science and Technology, Kattankulathur Campus, Chennai	21 February 2020
12	Krishna M. Sivalingam	Cloud-based 5G Radio Access and Core Networks: Overview and Performance Issues (online talk)	VMware USA and India	11 June 2020
13	Krishna M. Sivalingam	Cloud-based 5G Radio Access and Core Networks: Overview and Performance Issues (online talk)	SSSIHL, Prashanti Nilayam	10 October 2020
14	Krishna M. Sivalingam	AI and ML Techniques for Infrastructure Management: Orchestration in 5G Networks	KCG	24 November 2020
15	V. Krishna Nandivada	Challenges in Analyzing and Optimizing Parallel Programs	IIT Mandi (online)	19 November 2020
16	Chester Rebeiro	Securing the SHAKTI Processor	Tutorial at VLSID Conference	July 2020
17	Chester Rebeiro	Securing the SHAKTI Processor	Invited talk at RWTH Aachen	4 November 2020
18	Chester Rebeiro	Micro-architectural Attacks	ACM Summer School on Cyber Security	December 2020
19	Manikandan Narayanan	Computational multi-tissue models of health and disease	Invited talk at Department of Biotechnology, SVCE, Sriperumbudur during online National Workshop on Genomics Data Science in Precision Medicine Design	February 2021
20	John Augustine	Game Theoretic Aspects of Distributed Trust	Invited Talk at ReLAX workshop on Games	1-4 February 2021
21	P Sreenivasa Kumar	Ontologies for Program Analysis	Invited talk at SEMTECH-2020 (International Workshop on Semantic Technologies for Data and Knowledge Representation)	24 February 2021

22	P Sreenivasa Kumar	Program Analysis through Ontologies	FDP on Semantic Intelligence at NIT Kurukshetra	27 September 2020
23	Arun Rajkumar	Introduction to Machine Learning	Rajiv Gandhi National Institute for Youth Development	28 September 2020
24	Arun Rajkumar	Introduction to Online Learning	Rajiv Gandhi National Institute for Youth Development	28 September 2020
25	Arun Rajkumar	Introduction to Online Learning	FDP in Intelligent Information System, PSG Tech	18 August 2020

### Honours and awards obtained by faculty

S. No.	Faculty Member	Award	Awarded by	Awarded for	Date of Award
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#### i. Honours

1	Shweta Agrawal	Invited Talk at Asiacrypt 2020	International Association of Cryptologic Research (IACR)		7 December 2020
2	Shweta Agrawal	Invited as Program Co-Chair at Asiacrypt 2022	International Association of Cryptologic Research (IACR)		14 August 2020
3	John Augustine	Invited as Program committee co-chair for ICDCN 2022	ICDCN Steering Committee		December 2020

#### ii. Awards

1	Shweta Agrawal	Best Paper Award at Eurocrypt 2020	International Association of Cryptologic Research (IACR)	Best Paper	10 April 2020
2.	KC Sivaramakrishnan	Distinguished Paper Award at ICFP 2020	The ACM Special Interest Group on Programming Languages (SIGPLAN)	Distinguished Paper	25 August 2020

### Fellowships of Academies and Professional Societies

S. No.	Faculty	Year of Admission
<b>INAE</b>		
1.	C. Siva Ram Murthy	2002
2.	Krishna M. Sivalingam	2015
<b>INSA</b>		
1	C. Siva Ram Murthy	2013
<b>Others</b>		
1	NASI, C. Siva Ram Murthy	2013
2	IEEE, C. Siva Ram Murthy	2012
3	TWAS, C. Siva Ram Murthy	2014
4	IEEE: Krishna M. Sivalingam	2014

### Journal Editorial Boards

S. No.	Faculty Member	Position (Editor/Member)	Journal Name
1	KC Sivaramakrishnan	Guest Editor	<i>Special Issue of the Journal of Functional Programming (JFP) on the Theory and Practice of Algebraic Effects and Handlers</i>
2	Madhu Mutyam	Associate Editor	<i>IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems</i>
3	Krishna M. Sivalingam	Member, Editorial Board	<i>IEEE Networking Letters</i>

### 4.7.4. Design and Development Activities

#### New facilities added or major equipment procured

S. No.	Equipment	Value (Rs. in lakh)
1	CPU-GPU Compute Nodes	75
2	CPU-GPU Compute Nodes	160

### Patents

#### Patents filed

S. No.	Faculty Member	Topic of Patent
1	Rupesh Nasre	A methodology for consensus prioritization of regression test-cases supported by parallel execution windows
2	C. S. Ganesh and Krishnamoorthy Sivalingam	Packet parsing in a communication network
3	C. S. Ganesh and Krishnamoorthy Sivalingam	Data packet processing and transmission in a network
4	C. S. Ganesh and Krishnamoorthy Sivalingam	A switching device
5	V. Krishna Nandivada and Aman Nougrihiya	Self-stabilizing compilers
6	Chester Rebeiro and Nikhilesh K. Singh	Method and electronic device for mitigating micro-architectural side-channel attack by dynamic resource allocation

#### Patents awarded

S. No.	Faculty Member	Topic of Patent
1	Rajat Rao and Chester Rebeiro	Method and system to protect, license and verify intellectual property cores on FPGAs (IN201841040836A)

#### 4.7.5. Research and Consultancy

##### Sponsored research projects (ongoing and new)

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1	HPC Application Frameworks	9 March 2020-8 March 2023	MeitY	130	Rupesh Nasre
2	NSM Nodal Centre for Training in HPC and AI	15 December 2020-14 December 2022	CDAC	38	Rupesh Nasre
3	Multicore OCaml support for Tezos	June 2019-June 2021	Tezos Foundation	178	KC Sivaramakrishnan
4	Post quantum cryptography challenges, opportunities and beyond	March 2020-March 2025	SERB	127.728	Shweta Agrawal
5	Design and development of blockchain based technologies	February 2019-May 2022	National Security Council Secretariat	100	Shweta Agrawal
6	Computing on encrypted data: new paradigms in functional encryption	January 2019-January 2022	CEFIPRA	51.1	Shweta Agrawal
7	Indigenous 5G test bed: building end to end 5G test bed in India	21 March 2018-30 September 2021	Department of Telecommunications, Government of India	6000	Krishna Sivalingam (Co-PI); IITM PI: Dr. Radhakrishna Ganti (EE); Overall Project Lead: Prof. Bhaskar Ramamurthi (Director, IIT Madras)
8	Programming model/ language and compiler for emerging HPC systems	2019-2022	NSM	346	V. Krishna Nandivada (PI), U Ramakrishna, IIT Hyderabad (Co-PI)
9	Optimizing HPC applications	2019-2022	SERB, CRG	30	V. Krishna Nandivada
10	SPARE: Safe Portable Partial-Analysis Results for JAVA Programs	2019-2022	IBM Canada	45	V. Krishna Nandivada
11	Computational methods for multi-tissue models of health and disease	September 2018-September 2023	Wellcome Trust/ DBT India Alliance Intermediate Fellowship Award	355	Manikandan Narayanan
12	Multi-modal data integration and imputation methods to infer causal gene networks and cellular composition	February 2021-February 2024	NFSG, IITM	15	Manikandan Narayanan

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
13	Matchings under preferences - theory and practice	February 2020-February 2023	SERB CRG	15	Meghana Nasre (PI), Prajakta Nimbhorkar CMI (Co-PI)
14	Rigorous verification and validation of memory systems in heterogeneous computing systems using statistical model checking	2019-2021	Scheme for Promotion of Academic and Research Collaboration	32.53	Madhu Mutyam
15	Simulation-based optimization in a cumulative prospect theory framework	2018-2021	Department of Science & Technology	45.90	Prashanth L.A.
16	Conversation agents for urban Navigation	2019-2022	IMPRINT	68.20	Ravindran B. Gitakrishnan Ramadurai, CE
17	JC Bose Fellowship	2016-2021	Department of Science & Technology	95.00	Siva Ram Murthy C.
18	Scene understanding for identification of covert geolocations, using a hyper-classifier based visual intelligent system	2017-2022	IMPRINT	187	Sukhendu Das Ravindran B Kaushik Mitra, EE
19	Automatic speech recognition in Indian English, Tamil, Hindi, and text to speech synthesis for conversational speech in Indian languages	2020-2021	Ministry of Electronics & Information Technology	92.02	Hema A Murthy, Umesh S., EE
20	Speech to Speech Machine Translation (SSMT): Pilot System	2020-2021	Office of the Principal Scientific Adviser	180.15	Hema A Murthy, Umesh S., EE
21	National Mission on Interdisciplinary Cyber Physical Systems	2020-2025	Department of Science & Technology	800.00	Kamakoti V
22	Improving the resource efficiency of CPUs for deep learning	2020-2021	Intel Technology India Private Limited	7.50	Pratyush Kumar
23	Multilayer network centrality measures to identify known and novel regulators of tissue-tissue communication	2020-2021	Intel Technology India Private Limited	7.50	Ravindran B

**RBIC projects (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Kamakoti V	Technology support to combat COVID-19 pandemic	National Stock Exchange Foundation	30.00
2	Kamakoti V	Development of open-source platforms and capability creation initiative	City Union Bank Limited	320.00
3	Ravindran B	PhD Fellowship in natural language processing	Google Research	31.95
4	Ravindran B	Robert Bosch Centre for Data Science and AI	Robert Bosch Engineering and Business Solutions Private Limited	2000.00
5	Ravindran B	Learning representations on network data	Intel Technology India Private Limited	108.00
6	Kamakoti V	Performance assessment of star registration software	IG Registration Office, Government of Tamil Nadu	194.70
7	Mitesh Khapra	Knowledge graph driven domain specific multimodal conversation systems	Google Research	30.11
8	Ravindran B	Research advisory services in the area of data sciences and artificial intelligence for the Corporate Technology Office (CTO) and the TCS Retail Business Unit	Tata Consultancy Services Limited	14.16
9	Ravindran B	Development of machine learning algorithm to model semi-conductor fab manufacturing process as multiple states	Applied Materials India Private Limited	95.09
10	Mitesh Khapra	Attention mechanisms in deep learning	Robert Bosch Engineering and Business Solutions Private Limited	10.00
11	Pratyush Kumar	Connected Autonomous Shared Electric (CASE) shuttles project	Robert Bosch Engineering and Business Solutions Private Limited	10.00
12	Kamakoti V	AI and thermal imaging based breast cancer detection	BNY Mellon Technology Private Limited	90.00
13	Ravindran B	Program mentorship consultancy	Greyatom Edutech Private Limited	47.20
14	Anurag Mittal	Google India PhD Fellowship in Machine Perception for Arulkumar S (CS15D202)	Google Ireland Limited	35.85
15	Mitesh Khapra	Automatic question generation using reinforcement learning	Adobe Systems Incorporated	27.11
16	Ravindran B	Deep learning methods for medical language processing	BUDDI Health	24.00

17	Ravindran B	Consultation on Education Initiatives of GITAA Private Limited	GITAA Private Limited	23.00
18	Ravindran B	A generalized model for lead scoring	Freshworks Inc	56.28
19	Mitesh Khapra	Google India Ph.D. Fellowship in Natural Language Processing for Ananya Sai	Google Ireland Limited	36.42
20	Kamakoti V	Tata Elxsi-IIT Madras CSR project on Open Source based Translation Research in ICT	TATA Elxsi Limited	100.42
21	Sukhendu Das	Identification and detection of spatial layouts of fixed set of fixtures in images	Nathan Research Systems Private Limited	7.08
22	Chester Rebeiro Kamakoti V	Hardware realizable algorithm for packet classification to support throughput of up to 100Gbps	Centre for Artificial Intelligence and Robotics	20.00
23	Krishna Moorthy Sivalingam	Orchestration for network slicing in 5G networks based on SDN/NFV concepts design and implementation	VMware University Research Fund	76.54
24	Mitesh Khapra	AI for social good: NLP tools for under-represented languages	Google Ireland Limited	7.09
25	Chester Rebeiro	Instant side-channel vulnerability estimation of digital designs	Qualcomm Technologies, Inc.	10.20
26	Sukhendu Das	Technical proposal for your consultancy services for collaborative research on analyzing ventilator images to detect respiratory abnormalities	Cloudphysician Healthcare Private Limited	0.59
27	Pratyush Kumar, Mitesh Khapra	Indian sign language recognition	Microsoft Corporation India Private Limited	62.11
28	Mitesh Khapra	Knowledge graph driven QA benchmark for Indian languages	Google Asia Pacific Private Limited	11.02
29	Narayanaswamy N S	Tharangini - exploratory technology prototyping	Jivass Technologies	5.00

### Distinguished visitors to the department

S. No.	Visitor and Designation	Date of Visit	Purpose of Visit
1	Dr Vyas Sekar, Associate Professor, CMU USA and Venky Harinarayan-Anand Rajaraman Visiting Faculty, Department of CSE, IIT Madras	9-13 March 2020	Discussion sessions with M.Tech students and MS/PhD research scholars of CSE and EE departments

### 4.7.6. Other Activities of the Department

#### Faculty visits within India

S.No.	Faculty Member	Purpose of Visit	Date and Venue
1	P Sreenivasa Kumar	VIT Vellore Faculty Selection Committee	6 February 2021
2	P Sreenivasa Kumar	VIT Vellore BOS Meeting	February 2021



## 4.8 Department of Electrical Engineering

### 4.8.1. Introduction

The Department of Electrical Engineering carries out research and technology development in the frontier areas of communications, signal processing, networks, microgrids, integrated circuits, systems, microelectronics, MEMS, electromagnetics, photonics and biomedical devices. The department has initiated the following Centres of Excellence that are recognised nationally for research and development: Centre of Decentralized Power Systems, Centre for Battery Research, Centre for NEMS and Nanophotonics, Healthcare Technology Innovation Centre (HTIC), and Centre of Excellence in Wireless Technology (CEWiT). Some recent additions include Centre for Programmable Photonic Circuits and Systems (CPPICS) and Next-generation AMOLED displays. The department recently received funding to explore the possibility of setting up new Centres of Excellence in various areas. Some such potential centres include Quantum Information, Communication and Computing (CQuICC), Photonic Integrated Circuit (PIC), OLED Display Tech, Advanced Memory and Computing, and Intelligent Networks. The collaborative efforts of the department are currently grouped under the following areas of research:

#### EE1 - Communications and Signal Processing

Communications and Networks: Laboratories working in this group focus on cutting-edge problems in wireless communications and networks. Their research focuses on mathematical modeling, analysis, designing of new algorithms and prototyping using test beds. Their interests span physical layer modulation and coding, scheduling and rate adaptation, estimation and detection, resource allocation and optimization, network control, information theory, 4G/5G technology and standards, LTE systems, MIMO systems, cognitive radios, mobile IP, optical backbone networks and software defined radios and networks.

Image and speech signal processing: Labs working in image processing and computer vision focus on various aspects, ranging from image deblurring and dehazing, underwater imaging, image and video matting, HDR to vision tasks like face recognition, 3D geometry inpainting and depth from motion blur. They also work on developing novel computational cameras and mathematical framework for their

analysis as well as deep learning architectures for solving various image processing and computer vision problems. The Speech Research Group works mainly on the Automatic Speech Recognition (ASR) for Indian language, deep learning methods for speech recognition and multilingual speech recognition.

#### EE2 - Power Systems, Power Electronics and High Voltage

The group is actively involved in research related to power electronics based motor drives, grid integration of renewable energy sources with a focus on solar and wind, power quality issues and mitigation techniques, smart grids, power systems modelling and analysis, energy markets, nanotechnology, condition monitoring of power apparatus adopting multi-fusion sensor techniques, sterilization of liquid foods and effluent treatment.

#### EE3 - Microelectronics and VLSI Design

The Microelectronics group focuses on design, simulation, modeling, fabrication and testing of very small electronic components and systems. The Microelectronics and MEMS Lab in the department is well-equipped for semiconductor device and MEMS fabrication, characterization, modeling and simulation. It has Class-100 and Class-1000 clean rooms, which house the major facilities that include a mask writer, double-sided lithography facility, substrate bond aligner, LPCVD for polysilicon deposition, PECVD for dielectrics, diffusion furnaces, e-beam metallization unit and RIE for dry etching. The VLSI group is involved in research in the areas of analog, mixed signal, and RF design, analysis and simulation of noise in circuits, VLSI DSP architectures, Programmable Analog Pulse Shaping for Ultra-Wideband Applications and reconfigurable computing.

#### EE4 - Control and Instrumentation

The research focus of the group spans a wide range. The recent efforts have been in modeling, design and control for intelligent robotics, biomedical instrumentation, healthcare, transportation and power networks, sensors for automotive and transport applications, and cyberphysical systems.

#### EE5 - RF and Photonics

The group focuses on applications in a variety of interdisciplinary areas such as radar systems,



satellite imaging, fiber and free-space classical and quantum technologies, optoelectronic devices, lasers, signal processing, metrology and sensing, microwave remote sensing, and microwave imaging. Research activities include design, analysis and synthesis of devices, components, and aspects of system and network design. The group designs, fabricates, and analyses various kinds of silicon photonic, plasmonic and diffractive optic devices. In addition to physical devices, research on Tbps optical communication systems with advanced modulation formats, optical signal processing and quantum communication are also investigated. The group also does active research on discrete and distributed fiber sensors, high-power fiber lasers operating at different wavelengths, narrow-line lasers and pulsed lasers. In the radio or microwave realm, work is ongoing on aspects of satellite remote sensing, inverse microwave imaging, computational

electromagnetics, and radio over fiber millimeter wave communications for radar systems, optical fronthauling for 5G networks. There are active research collaborations with several international universities such as the Optoelectronic Research Center Southampton, University of Rochester, University of Melbourne, University of Glasgow, to name a few, and Indian industries like Sterlite Technologies, LightMotif and Forbes Marshall. The group receives research funding from different Government agencies, DRDO and industry.

### EE6 - Integrated Circuits and Systems

This group deals with various aspects of designing integrated circuits and embedded systems. The group has highly experienced faculty in analog/mixed signal and digital ICs, VLSI CAD and embedded systems with a track record of driving full chip products right from concept to design, tapeout, prototyping and testing.

## 4.8.2. Academic Programmes

### New courses introduced

S. No.	Course No.	Title
1	EE5205	Fundamentals of Electric Vehicles: Technology and Economics
2	EE6433	Distributed Optimization for Control
3	ID5840	Quantum Integer Programming
4	EE6407	Instrumentation for Ocean Technology

### Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	155	142	73	53	16	439
Dual Degree			58	78	86	222
M.Tech.	81	68			3	152
M.S.	83	61	56	21	22	243
Ph.D.	56	38	45	53	84	276
Total	375	309	232	205	211	1332

### Student/Scholar who attended conference/seminar/symposia abroad/India

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposia/Workshop	Date and Venue	Financial Assistance from
<b>Abroad</b>					
1	Shyam S	EE17S018	SPIE Photonics Europe	6-10 April 2020, France (virtual conference)	Institute

2	Akshay K	EE17D700	2020 IEEE Electron Devices Technology and Manufacturing Conference (EDTM)	6-21 April 2020, Malaysia (virtual conference)	Institute
3	Dibakar Yadav	EE14D019	2020 IEEE Electron Devices Technology and Manufacturing Conference (EDTM)	6-21 April 2020, Malaysia (virtual conference)	
4	Ananya Ghosh	EE16D009	12th International Congress on Membranes and Membrane Processes (ICOM 2020)	7-11 December 2020, UK (virtual)	IITM
5	Fiheon Imroze	EE16D301	79th Device Research Conference (DRC 2020)	21-24 June 2020, USA (virtual conference)	IITM
6	Fiheon Imroze	EE16D302	62nd Electronic Materials Conference (EMC 2020)	24-27 June 2020, USA (virtual conference)	IITM

#### Students/Scholars who won outside prizes and awards

S. No.	Student/Scholar	Roll No.	Prize	Prize awarded by
1	Raghuram Dharmavarapu	EE14D211	Institute Research Award	IIT Madras
2	Lakshmi Areekath	EE17D014	Institute Research Award	IIT Madras
3	Lakshmi Areekath	EE17D014	Malathi Veeraraghavan Scholar	IIT Madras Alumni
4	Rekha Yadav	EE18S042	2021 Incubic Milton Chang Travel Grant CLEO	2021 Incubic Milton Chang Travel Grant CLEO
5	Kuldeep Purohit	EE14D217	Keshav Ranganath award	IIT Madras
6	Siva Subramaniam C N	EE20S068	Samsung-IITM Pravartak Fellowship Award	IITM Pravartak Technologies Foundation and Samsung India
7	Anmol Zanwar	EE16B160	Samsung-IITM Pravartak Fellowship Award	IITM Pravartak Technologies Foundation and Samsung India
8	Mohit Shrivastava	EE16B157	Samsung-IITM Pravartak Fellowship	IITM Pravartak Technologies Foundation and Samsung India
9	Gautam Shaw	EE15D047	BTIRC Award for Research with Significant Industrial Impact	IEEE International Conference on Advanced Network and Telecommunications Systems

#### Students/Scholars who won Institute Convocation/Institute Day Prize

S. No.	Student/Scholar	Roll No.	Prizes
1	Rajat Vadiraj Dwaraknath	EE16B033	President of India Prize
2	Rajat Vadiraj Dwaraknath	EE16B033	Bharat Ratna M Visvesvaraya Memorial Prize
3	Rajat Vadiraj Dwaraknath	EE16B033	Siemens Prize
4	Alfred Festus Davidson	EE15B073	Shri V. Srinivasan Memorial Prize
5	Alfred Festus Davidson	EE15B073	Prof. Achim Bopp Endowment Prize
6	Alfred Festus Davidson	EE15B073	Philips India Prize
7	Priyatham Kattakinda	EE18M058	Siemens Prize
8	Mrinmoy Saha	EE18M048	Prof. Achim Bopp Endowment Prize

**Web-Enabled M.Tech**

A Web-Enabled M.Tech programme was started in 2017 by the Department of Electrical Engineering to allow working professionals from industry to pursue an M.Tech through high-quality video links. The students enrolled in this programme are expected to take three to four years to complete the programme, owing to their being enrolled in the programme while simultaneously working. The first batch of students with 14 students graduated in the 2020 Convocation.

The programme was started in 2017 with Qualcomm being the only participating company. Now, there are six additional companies on board, including Analog Devices, Valeo, Cypress, HCL (Sankalp), Signal Chip and BEL. Currently, the following four streams are being offered – Communication and Signal Processing, Integrated Circuits and Systems (VLSI), Multimedia and Signal Processing, and Microelectronics. Twenty-five faculty members from the departments of Electrical Engineering and Computer Science and Engineering are involved in teaching the courses for these streams.

**4.8.3. Faculty and Their Specialisations****Faculty**

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Dr David Koilpillai R ( <b>Head</b> )	Signal processing, communication
Dr Amitava DasGupta	Semiconductor devices and MEMS
Dr Andrew Thangaraj	Signal processing, communication
Dr Anil Prabhakar	Photonics, magnonics, assistive technologies
Dr Anjan Chakravorty	Semiconductor devices
Dr Aravind R	Signal processing, communication
Dr Arun D. Mahindrakar	Digital control and systems theory
Dr Balaji Srinivasan	Fiber laser and sensors
Dr Bhaskar Ramamurthi	Signal processing, communication
Dr Bijoy Krishna Das	Silicon photonics
Dr Bobby George	Instrumentation and measurements
Dr Deepa Venkitesh	Photonics, optical communication
Dr Devendra Jalihal	Signal processing, communication
Dr Enakshi Bhattacharya	Semiconductor devices
Dr Giridhar K	Signal processing, communication
Dr Harishankar R	Plasma, RF electromagnetics
Dr Jagadeesh Kumar V	Instrumentation and measurements
Dr Kalyan Kumar	Power systems
Dr Karmalkar S	Semiconductor devices
Dr Krishna Vasudevan	Power electronics
Dr Mahesh Kumar	Power systems
Dr Nagendra Krishnapura	Analog circuits
Dr Nandita DasGupta	Semiconductor devices
Dr Rajagopalan A N	Image processing
Dr Sarathi R	High voltage
Dr Shanthi Pavan Y	Analog circuits

Dr Shanti Bhattacharya	Optics
Dr Shanti Swarup	Power systems
Dr Sridharan K	Control systems and digital architecture
Dr Srikrishna	Signal processing, communication
Dr Srirama Srinivas	Power electronics
Dr Umesh S	Speech processing
Dr Vinita Vasudevan	Digital systems and VLSI
<b>Associate Professors</b>	
Dr Anbarasu M	Nanoelectronics, NVRAM, phase change memory
Dr Ananth Krishnan	Computational electromagnetics
Dr Aniruddhan S	Analog and RF circuits
Dr Arun Pachai Kannu	Signal processing, communication
Dr Bharath Bikkaji	Control theory
Dr Debdutta Ray	Semiconductor devices and organic LEDs
Dr Deleep R Nair	Semiconductor devices and MEMS
Dr Gaurav Raina	Communication networks, control systems
Dr Kamalesh Hatua	Power electronics
Dr Krishna Jagannathan	Optical networks
Dr Krishna S	Power systems
Dr Lakshminarasamma N	Power electronics
Dr Mohansankar S	Biomedical devices
Dr Nitin Chandrachoodan	Digital systems and architectures
Dr Pradeep Sarvepalli	Classical and quantum coding theory
Dr Radhakrishna Ganti	Communications systems
Dr Ramalingam CS	Speech processing
Dr Ramkrishna Pasumarthy	Control theory
Dr Sheetal Kalyani	Machine learning for communications
Dr Soumya Dutta	Semiconductor devices and organic electronic devices
Dr Uday Khankhoje	Inverse problems, computational electromagnetics
Dr Venkatesh Ramaiyan	Wireless networks
Dr Venkatesh TG	Communication networks
<b>Assistant Professors</b>	
Dr Abhishek Sinha	Theoretical machine learning, networks
Dr Arun Karuppaswamy	Power electronics
Dr Avhishek Chatterjee	Communication networks
Dr B.N. Shivananju	Instrumentation and nano-bio-photonics
Dr Bhaswar Chakrabarti	Micro and nanoelectronics, neuromorphic computation
Dr Janakiraman Viraraghavan	Digital systems and architectures
Dr Jayaraj Joseph	Medical devices, instrumentation, image-free ultrasound
Dr Kaushik Mitra	Image processing

Dr Manivasakan R	Communication systems
Dr Mathiazhagan C	Analog circuits
Dr Puduru Viswanatha Reddy	Control, theory and game theory
Dr Quadeer Ahmad Khan	Digital system, low power design
Dr Rachael Kalpana	Control theory
Dr Saurabh Saxena	Analog and mixed signal circuits, clock generators, SERDES

**INSPIRE Faculty**

Dr Mansi Sharma	Computer vision, machine learning, computational imaging and 3D displays
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**Ramalingaswami Fellow**

Dr Ramya Balachandran	Image-guided surgery, medical image processing
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**Visiting Faculty**

Dr M. A. Atmanand	
Dr Liam Paul Barry	
Dr Shayam Mookherjea	
Dr Govind P. Agrawal	
Dr -Ing. Marian Walter	

**Emeritus Scientist/Emeritus Professor**

Dr Ashok Jhunjhunwala	Optical communication, computer networks, wireless communication
Dr Christopher S	Radar signal processing

**Scientific Officers/Engineers**

Jeyasutha Avudai Thangam	
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**Short-term courses/workshops/seminars/symposia/conferences organised by the faculty members**

S. No.	Coordinator(s)	Title	Period
<b>Conference</b>			
1	Shreepad Karmalkar	Vertical section on Materials Processing Technology in Vaishwik Bharatiya Vaigyanik (Vaibhav) summit	17 October 2020
<b>Workshop</b>			
1	Shreepad Karmalkar	Introduction to Research, IIT Bombay	21-22 November 2020

**Short-term courses/workshops/seminars/symposia/conferences/trainings attended by the faculty members in academic institutions and public sector undertakings**

S. No.	Faculty Member	Title	Institution	Period
<b>Workshop</b>				
1	Abhishek Sinha	Mathematical Performance Modeling and Analysis (MAMA) 2020	USA (held online due to COVID-19)	8 June 2020
<b>Conferences</b>				
1	Abhishek Sinha	IEEE International Symposium on Information Theory (ISIT 2020)	USA (held online due to COVID-19)	21-26 June 2020

2	Abhishek Sinha	ACM SIGMETRICS 2020	USA (held online due to COVID-19)	8-12 June 2020
3	Srikrishna Bhashyam	IEEE ICASSP 2020	Spain (held online due to COVID-19)	4-8 May 2020
4	Atmanand M A	IEEE/MTS Global Oceans 2020: Singapore-US Gulf Coast	USA (held online due to COVID-19)	5-14 October 2020
5	Shreepad Karmalkar	2020 IEEE Electron Devices Technology and Manufacturing Conference (EDTM)	Malaysia	6-21 April 2020

### Special lectures delivered by the faculty in other institutions

S. No.	Faculty Member	Topic of Lecture	Institution	Date
1	Anbarasu Manivannan	Picosecond electrical switching dynamics of phase change memory	Micron	30 October 2020
2	Anil Prabhakar	Quantum ICT - Translating quantum science to technology	BEL, Bengaluru	9 November 2020
3	Anil Prabhakar	Quantum computing and quantum communications	IIITDM Kurnool	31 October 2020
4	Anil Prabhakar	Application and need of quantum technology	Military College of Technology, Pune	26 October 2020
5	Anil Prabhakar	Challenges and opportunities in building the quantum internet	SETS, Chennai	19 September 2020
6	Atmanand M A	Blue Economy - Indian context	IEEE Oceanic Engineering Student Chapter, MTS and IIT Delhi Seminar	4 January 2021
7	Avhishek Chatterjee	A tale of some happening areas and their 'probabilistic' kinship	IEEE IIITD Elysium, 2020	October 2020
8	Balaji Srinivasan	Accurate BFS estimation in simultaneous multi-point sensing based on externally modulated BOFDA	Asia Conference on Photonics, Beijing (2020)	26 October 2020
9	Balaji Srinivasan	Distributed temperature sensing for real-time power line monitoring using Raman scattering in optical fibers	SRM University, Chennai	16 May 2020
10	Balaji Srinivasan	Distributed temperature sensing using distributed anti-stokes Raman thermometry	IEEE Chapter, Belgaum	14 July 2020
11	Boby George	Recent advances in non-intrusive sensing based on magnetically or capacitively coupled schemes and related applications	Plenary lecture: IEEE CMI 2021	10 January 2021
12	Enakshi Bhattacharya	Silicon MEMS Pressure Sensors	IEEE Sensors Council New South Wales Chapter, Sydney	10 February 2021
13	Enakshi Bhattacharya	BioMEMS	FDP, SP College, Mumbai	23 November 2020

14	Enakshi Bhattacharya	Miniaturised electrochemical silicon biosensor system for the detection of triglycerides	FDP, IIT, Indore	19 February 2021
15	Enakshi Bhattacharya	MEMS sensors	FDP, NIT Jalandhar	16 October 2020
16	Enakshi Bhattacharya	MEMS pressure sensors	AICTE STTP, SMVEC, Pondicherry	28 October 2020
17	Puduru Viswanadha Reddy	Stability and negotiation of long-term agreements in cooperative difference games with non-transferable utility	IIT Kharagpur (IEEE Control Systems Society - Kharagpur Chapter)	9 October 2020
18	Shanti Bhattacharya	Manipulating light	Talk hosted by the IISST OSA and SPIE student chapters, Indian Institute of Space Science and Technology	13 November 2020
19	Shanti Bhattacharya	Shrinking optics, expanding possibilities	Photonics Colloquium hosted by OSA IITM student chapter	31 July 2020
20	Shanti Swarup	Energy management system using internet of energy	National Institute of Technology Silchar	1 September 2020
21	Shanti Swarup	Recent trends in power system automation and SCADA	National Institute of Technology Trichy	7 September 2020
22	Shanti Swarup	Smart grid perspective of Electric Vehicle, Energy Management System (EV-EMS)	Kamaraj College of Engineering and Technology, Madurai	11 September 2020
23	Shanti Swarup	Security challenges in IoT enabled smart grid	National Institute of Technology Kurukshetra	27 September 2020
24	Shanti Swarup	Advanced concepts in digital protection	College of Engineering, Pune	1 December 2020
25	Shanti Swarup	Demand side management and demand response in smart grids and micro grids	SRM University	5 December 2020
26	Shanti Swarup	Smart grid and renewable energy integration for autonomous power grid network	Coimbatore Institute of Technology	17 December 2020
27	Shanti Swarup	Impact of electric vehicles on the power grid	SVCE, Chennai	13 February 2021
28	Shanti Swarup	Advances in smart grid technologies for electric power systems	National Institute of Technology Sikkim	27 February 2021
29	Shreepad Karmalkar	Follow No One, But Learn from Everyone and Acknowledge it Too	Institute Lecture at IIT Roorkee	11 October 2020
30	Shreepad Karmalkar	Engineering problem solving	Online webinar for G.H. Rasoni Institute of Engineering and Technology, Nagpur	1 June 2020

31	Shreepad Karmalkar	Engineering problem solving	Online webinar for St Joseph Institute of Technology	19 June 2020
32	Shreepad Karmalkar	Recipe for effective and efficient teaching	Chief Guest Speech at Teachers Day Celebration of Electrical Engineering Department of IIT Bombay	23 September 2020

### Awards obtained by faculty

S. No.	Faculty Member	Award	Awarded by	Awarded for	Date of Award
1	Enakshi Bhattacharya	IEEE Sensors Council Distinguished Lecturer, 2021-2023	IEEE Sensors Council		January 2021-December 2023
2	Boby George	Recognition from IEEE TIM	IEEE Trans. Instrum. and Meas. (TIM)	Most published TIM author of all time (past 70 years) from India	December 2020
3	Boby George	Recognition from IEEE TIM	IEEE Trans. Instrum. and Meas. (TIM)	Top 70 most-published TIM authors in the past seven years: ninth in the world	December 2020
4	Shreepad Karmalkar	VSI Best Faculty Award for 2021	VLSI Society of India (VSI)	Award for contributions in teaching, popularising and creating some of the best minds in microelectronics in last 30 years in India	23 February 2021

### Journal Editorial Boards

S. No.	Faculty	Position	Journal Name
1	Amitava DasGupta	Associate Editor	<i>IETE Technical Review</i>
2	Amitava DasGupta	Associate Editor	<i>ISSS Journal of Micro and Smart Systems</i>
3	Andrew Thangaraj	Associate Editor	<i>IEEE Transactions on Information Theory</i>
4	Anil Prabhakar	Member-Editorial Board	<i>Scientific Reports, Nature</i>
5	Anil Prabhakar	Member-Editorial Board	<i>IEEE Transaction on Magnetics</i>
6	Balaji Srinivasan	Associate Editor	<i>Optics Express</i>
7	Boby George	Associate Editor	<i>IEEE Transactions on Industrial Electronics</i>
8	Boby George	Associate Editor	<i>IEEE Transactions on Instrumentation and Measurement</i>
9	Boby George	Associate Editor	<i>IEEE Sensors Journal</i>



10	Boby George	Associate Editor	<i>IET Science Measurement &amp; Technology</i>
11	Deepa Venkitesh	Member-Editorial Board	<i>Advances in Optics and Photonics</i>
12	Deepa Venkitesh	Member-Editorial Board	<i>Photonic Network Communications</i>
13	Jagadeesh Kumar V.	Associate Editor	<i>IEEE Transaction on Instrumentation and Measurement</i>
14	Krishna Jagannathan	Associate Editor	<i>IEEE/ACM Transactions on Networking</i>
15	Krishna Jagannathan	Editor	<i>Performance Evaluation</i>
16	Nagendra Krishnapura	Associate Editor	<i>IEEE Transactions on Circuits and Systems I: Regular Papers</i>
17	S. Umesh	Associate Editor	<i>Circuits, Systems and Signal Processing</i>
18	Shanthi Pavan	Associate Editor	<i>IEEE Journal of Solid-State Circuits</i>
19	Shanthi Pavan	Associate Editor	<i>IEEE Solid-State Circuits: Letters</i>
20	Shanti Bhattacharya	Associate Editor	<i>Optical Engineering</i>
21	Shreepad Karmalkar	Associate Editor	<i>IEEE Transactions on Education</i>
22	Srikrishna Bhashyam	Editor	<i>IEEE Transactions on Communications</i>
23	A.N. Rajagopalan	Senior Area Editor	<i>IEEE Transactions on Image Processing</i>

#### 4.8.4. Design and Development Activities

##### Patents

##### Patents filed

S. No.	Faculty Member	Topic of Patent
1	Boby George	An instrumentation system with a fully non-intrusive probe for AC voltage measurement
2	Boby George	Method and device for detecting debris in a tubular body
3	Boby George and Ferran Reverter	Simple direct microcontroller interface for capacitively-coupled resistive sensors
4	Boby George and Jagadeesh Kumar V	A non-intrusive magnetically coupled sensor for measuring liquid level
5	D Ray and P Swaminathan	A conducting electrochromic composite of metallic nanowires and multi-coloured thermochromic material
6	Soumya Dutta, Basudev Roy, Ayan Banerjee (IISER Kolkata)	Development of a field-effect device using conducting polymers such as poly(3,4-ethylenedioxythiophene) polystyrene sulfonate (PEDOT:PSS) layers made using microbubble lithography

**Patents awarded**

S. No.	Faculty Member	Topic of Patent
1	Boby George	Automatic flipping magnet type electromagnetic energy harvester
2	Boby George, Lelitha V. and Jayashankar V.	Inductive loop sensor device
3	Boby George and Jagadeesh Kumar V.	Sigma-Delta digital converter for resistive displacement sensor with a floating slide
4	Soumya Dutta	Polymer based disposable SAW device
5	Soumya Dutta	A method for deterministic transfer of reduced graphene oxide thin films
6	Atmanand M A	Tsunami detection system (patent applied while at NIOT)

**4.8.5. Research and Consultancy  
Sponsored research projects (new)**

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1	Design and development of partial discharge identification system for gas insulated system adopting fluorescent optical fibers	19 March 2020-18 March 2022	SERB	75.25	Balaji Srinivasan Sarathi R
2	Automatic speech recognition in Indian English, Tamil, Hindi, and text to speech synthesis for conversational speech in Indian languages - CoE	31 March 2020-30 March 2021	Ministry of Electronics and Information Technology	235.25	Umesh S
3	A low-power 8-16 Gb/s/pin Full-duplex wire line transceiver	25 March 2020-24 March 2023	Ministry of Electronics and Information Technology	78.523	Saurabh Saxena
4	Design and development of WBG device based high current converters for industry applications-NaMPET Phase-III	28 May 2020-27 May 2023	Ministry of Electronics and Information Technology	96.96	Kamalesh Hatua
5	Multilinguality in speech technologies	26 August 2020-25 August 2023	Department of Science and Technology	38.44	Umesh S
6	Self-aligned double poly-silicon emitter bipolar technology for RF applications	29 September 2020-28 September 2022	Department of Science & Technology	18.60	Amitava Das Gupta
7	Electromagnetic energy harvester for MR anti-vibration mount and its integration	26 November 2020-25 November 2022	Defence Research and Development Organisation	31.73	Boby George

8	Microfabrication and testing of piezo thin film integrated on Si MEMS structures for energy harvesting applications	24 November 2020-23 November 2023	Defence Research and Development Organisation	93.39	Amitava Das Gupta
9	Affordable technology solutions to address unmet healthcare needs	23 December 2020-31 December 2022	Stryker Global Technology Center Private Limited	75.00	Mohanasankar S
10	Fibre optic guided wave structural health integrity evaluation and diagnosis (SHIELD) for autonomous underwater vehicles (AUVs)	24 November 2020-23 November 2022	Defence Research and Development Organisation	48.30	Balaji Srinivasan
11	Development of atomically thin memristive devices for neuromorphic smart sensor networks	24 November 2020-23 November 2022	Science and Engineering Research Board	28.41	Bhaswar Chakrabarti
12	VAJRA Visiting Faculty - Dr Shayan Mookherjea	6 December 2019-5 December 2022	Science and Engineering Research Board	11.10	Bijoy Krishna Das
13	Centre for Programmable Photonic Integrated Circuits and Systems (CPPICS)	30 December 2020-29 December 2025	Ministry of Electronics and Information Technology	2665.80	Bijoy Krishna Das
14	Design and development of polar encoder and decoder hardware prototype for 5G testbed	23 November 2020-22 November 2023	Science and Engineering Research Board	10.05	Ganti Radha Krishnan
15	Investigation on partial discharge characteristics and dissolved gas analysis of punga oil	4 December 2020-3 December 2023	Science and Engineering Research Board	10.05	Sarathi R
16	Non-smooth primal-dual dynamics: application to resource placement problem	28 December 2020-27 December 2023	Science and Engineering Research Board	6.60	Arunkumar D Mahindrakar
17	Metro Area Quantum Access Network (MAQAN)	22 February 2021-21 November 2023	Ministry of Electronics and Information Technology	392.15	Anil Prabhakar
18	Demonstration of solution processable, slot-die coated organic photovoltaic modules with GT8 efficiency	18 January 2021-17 January 2024	Department of Science & Technology	351.40	Debdutta Ray
19	Design and development of next-generation photonic analog to digital converters (NG-PADC)	15 November 2019-14 November 2022	LightMotif Automation Sensors Systems Private Limited	23.00	Deepa Venkitesh
20	Realization of gallium oxide based power devices	10 December 2020-9 June 2023	Ministry of Electronics and Information Technology	21.60	Kamalesh Hatua

**Industrial consultancy projects (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Gaurav Raina	Visiting Professor at Krea University	KREA University	13.21
2	Sarathi R	L&T Pune Smart City project design review for electrical and instrumentation	Larsen and Toubro Limited	20.00
3	Mohanasankar S	High-resolution human brain imaging	Sudha Gopalakrishnan	250.00
4	Mohanasankar S	Rapid test kits for large-scale COVID-19 screening	Capgemini Technology Services India Limited	75.00
5	Mohanasankar S	Rapid test kits for large-scale COVID-19 screening	Fluor Daniel India Private Limited	50.00
6	Mohanasankar S	R&D for COVID test kits	India Nippon Electricals Limited	25.00
7	Mohanasankar S	Post-discharge newborn care through highly affordable technology	Cognizant Foundation	263.60
8	Jhunjunwala Ashok	Center for Battery Engineering (ABB)	ABB India Limited	200.00
9	Jhunjunwala Ashok	Center for Battery Engineering (Mahindra & Mahindra Limited)	Mahindra & Mahindra Limited	150.00
10	Jhunjunwala Ashok	Village Micro Grid (VMG)	ABB India Limited	99.00
11	Mohanasankar S	Robust Immunodiagnostic Instrumentation	J Mitra and Company Private Limited	75.00
12	Mohanasankar S	Indigenous manufacturing of quantitative diagnostics	Mitra Industries Private Limited	25.00
13	Ramkrishna Pasumarthy	Hybrid intelligent systems in autonomous vehicles	Robert Bosch Engineering and Business Solutions Private Limited	13.50
14	Ramkrishna Pasumarthy	Advanced process control system lab	Mormugao Port Trust	14.22

**RBIC projects (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Shanthi Pavan	Centre for Advanced Analog Mixed-Signal VLSI Design - Phase II	Texas Instruments India Private Limited	1136.20
2	Sarathi R	Evaluation and improvement of dielectric and insulation properties of epoxy casting resin obtained in India	Toshiba Corporation	10.00
3	Jhunjunwala Ashok	Center of Battery Engineering (ESSEL)	Essel Green Mobility Limited	177.00
4	Jhunjunwala Ashok	Center of Electric Vehicle (Power Grid)	Power Grid Corporation of India Limited	34.66
5	Jhunjunwala Ashok	Center for Battery Engineering (AL)	Ashok Leyland Limited	177.00

6	Jhunjhunwala Ashok	Center of Electric Vehicle (ADI)	Analog Devices	176.35
7	Ganti Radha Krishnan	Intel India Faculty Excellence Program	Intel Technology India Private Limited	30.00
8	Jhunjhunwala Ashok	Center for Battery Engineering (IOCL)	Indian Oil Corporation Limited	150.00
9	Ramkrishna Pasumarthy	Smart environment monitoring using GDML	Cognizant Technology Solutions India Private Limited	30.72
10	Rajagopalan A N	Visual enhancement of SEM images	KLA-Tencor Corporation	35.85
11	Giridhar K	Design and development of LPI/LPD waveforms on COTS testbed	Defence Electronics Applications Lab	59.61
12	Jhunjhunwala Ashok	Center for Battery Engineering and Electric Vehicle (GAIL)	GAIL India Limited	47.20
13	Rajagopalan A N	Development of Algorithms for Missile Approach Warning System (MAWS)	Instruments Research and Development Establishment	186.40
14	Rajagopalan A N	Development of algorithms for motion deblurring of images	Instruments Research and Development Establishment	24.95
15	Christopher S	Development of sensor with smart antenna	Combat Vehicles Research and Development Establishment	183.05
16	Sheetal Kalyani	Algorithm development for improvement in tracking error and adaptive waveform selection for cognitive radar prototype	Defence Research and Development Organisation	28.32
17	Anil Prabhakar	Design and verification of quantum key chip	National Company of Telecommunication and Information Services	1043.56
18	Kaushik Mitra	Data-driven reconstruction and joint design of optics for lensless cameras	Qualcomm Technologies, Inc.	10.00
19	Kaushik Mitra	Reflection-free photography (Phase 1-Reflection Detection)	Samsung R&D Institute India Bangalore Private Limited	21.24
20	Balaji Srinivasan	Numerical investigations on the coherent combination of multiple fiber laser beams using tiled aperture combining technologies with robust phase control	Defence Research and Development Organisation	9.89
21	Christopher S	Design methodology towards the development of light weight flat panel prototype of active electronically scanned phased array antenna (AESA) and low-power Quad T/R modules for X-band radar applications	Defence Research and Development Organisation	294.26
22	Mohanasankar S	Research Scholar Fellowship	Wipro GE Healthcare Private Limited	159.30
23	Mohanasankar S	MRI Adaptive protocol workflow	Wipro GE Healthcare Private Limited	159.30

24	Rajagopalan A N	Generalization of deep networks for sparse defect inspection	KLA Corporation	18.50
25	Anil Prabhakar	Ising machines for quantum machine learning	KLA Corporation	18.18
26	Mohanasankar S	Large-scale digital solutions for child health monitoring	Helyxon Healthcare Solutions Private Limited	56.64
27	Krishna Vasudevan	Feasibility study of wireless power transmission	Larsen and Toubro Limited	6.25
28	Nitin Chandrachoodan	Mapping image processing workloads on emerging computational architectures	KLA Tencor Software India Private Limited	21.37
29	Mohanasankar S	Portable anterior segment eye screening device	Forus Health Private Limited	29.50

**Retainer consultancy (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Gaurav Raina	Advisory services to United India Insurance Company	United India Insurance Company Limited	133.63
2	Christopher S	Technical Advisory at Mistral Board	Mistral Solutions Private Limited	28.32
3	Ganti Radha Krishnan	Proposal for feasibility study of coexistence of 5MHz spectrum in 700 MHz band	National Capital Region Transport Corporation	4.72
4	Krishna Vasudevan	Design and operation of generator and control system	Enrecover Energy Recovery Solutions	1.18
5	Jayaraj Joseph	Xaliva POCT reader: design consultancy	Ricovr Healthcare Inc	5.00
6	Christopher S	Expert guidance and advice to achieve higher goals	Sundaram Fasteners Limited	28.32
7	Aniruddhan S	5G Reference design using foundry PDK	Cadence Design Systems (India) Private Limited	10.00

**Faculty members' participation with other institution under MoU**

S. No.	Faculty Member	Participation Details	University/Institution
1	Dr V. Jagadeesh Kumar	Video-based M.Tech (UoP M.Tech) in Communications and Signal Processing	BHEL
2	Bhaswar Chakrabarti	Collaborative research on resistive memory technology	Argonne National Laboratory
3	Enakshi Bhattacharya	Member of the CSIR-CEERI Research Council, Pilani	

**Distinguished visitors to the department**

S. No.	Visitor and Designation	Date of Visit	Purpose of Visit
1	Prof Johan Nilsson, University of Southampton	16 February-3 March 2020	SPARC collaboration

## 4.9. Department of Engineering Design

### 4.9.1. Introduction

Set up in 2006, the Department of Engineering Design is the 16th department to come up at the Indian Institute of Technology, Madras. Engineering design (ED) is a series of steps that engineers follow to come up with a solution to a problem. Many times, the solution involves designing a product that meets certain criteria and/or accomplishes a certain task. It is a decision-making process, often iterative, in which the basic sciences and the engineering sciences are applied to the optimal conversion of

resources to meet a stated objective. Students are first introduced to the design process along with fundamental mathematics, science and engineering, graphic art, design and aesthetics. They are trained not only in the mechanical aspects of design, but also in electronics, control and embedded systems for all-round skill development. Courses in geometric modelling, finite elements, materials engineering, automotive engineering, mechatronics, robotics, biomedical imaging and diagnostic techniques are also offered.

### 4.9.2. Academic Programmes

A first of its kind in India, the department provides much-needed leadership in engineering design with two novel dual-degree programmes. Both the programmes offer a B.Tech. in Engineering Design, and the first that began in 2006 offers an M.Tech. in Automotive Engineering. The second

programme, launched in 2008, offers an M.Tech. in Biomedical Design. From 2007, the department also offers M.S. and Ph.D. programmes. Recently, an interdisciplinary dual degree programme in Robotics was started with ED as the coordinating department.

### New courses introduced

S. No.	Course No.	Title
1	ED3170	Python Programming, NumPy and Graphics Libraries
2	ED5320	Design of Biophotonics Devices
3	ED5235	Automotive Power Electronics and Drives
4	ED5340	Data Science: Theory and Practice

### New lab established

VM Thomas Robotics Research and Testing Laboratory was inaugurated on 1 February 2021 by VM Thomas, Distinguished Alumnus, IIT Madras. The laboratory will be an important

facility for teaching the practical aspects of design, dynamics and control of industrial and field robots to students. It will also facilitate research by undergraduate and graduate students.

### Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
Dual Degree	72	64	53	56	76	321
M.S.	14	9	7	4	4+4	42
Ph.D.	16	15	16	13	13+27	100
Total	102	88	76	73	124	463



### Students/Scholars who won outside prizes and awards

S. No.	Student/Scholar	Roll No.	Prize	Prize Awarded by
1	Swathi Lakshmi B	ED14D011	Life Sciences Category, First Prize	2nd National Biomedical Research Competition
2	Sooraj S	ED14D200	Best Oral Presentation Award	COPEN 11 conference
3	Karthik Ramakrushnan	ED18S00	Best Paper in ITS Workshop 2020	12th International Conference on COMMunication Systems and NETworks
4	Kavitha I	ED18D600	Japan Student Service Organisation Fellowship	Toyohashi University of Technology
5	Akhil Challa, Parth Deshpande	ED17D404 ED15B011	Best Presentation Award	6th International Conference on Advances in Control and Optimization of Dynamical Systems

### Students/Scholars who won Institute Convocation/Institute Day Prize

S.No.	Student/Scholar	Roll No.	Prizes	Donor
1	Kesavan V S	ED15D006	Institute Research Award	Institute
2	Annamraju Sai Srikar	ED15D201		
3	Deepak Prakash K	ED15B010	Bhagalakshmi and Krishna Ayengar Award	Institute
			Prema and Nagaraja Setty prize	Institute
			Dr K. Gopinath and Padmini Gopinath Prize	D3P

### 4.9.3. Faculty and Their Specialisations

#### Faculty

Name and Qualifications	Major Areas of Specialisation
Professors	
Asokan T (Head)	Robotics, mechatronics, control, electro-hydraulic servo systems
Jayaganthan R	Materials engineering, nanomaterials and design, biomaterials, additive manufacturing, energy storage devices
Krishna Kumar R	Nonlinear finite elements, vehicle dynamics and tyre mechanics
Nilesh J. Vasa	Opto-mechatronics, laser-based sensing and micro- manufacturing
Ramanathan M	Geometric and solid modelling, CAD, computer vision, computational geometry, computer graphics, computational biology, shape search
Saravana Kumar G	CAD, design optimization, design for additive manufacturing, orthopedic biomechanics and biomedical image processing
Shankar Ram C S	Vehicle dynamics and control, transportation systems
Srikanth Vedantam	Design with novel materials, mechanical behavior of materials, wetting, microstructure evolution
Venkatesh Balasubramanian	Design thinking, innovation management, and human factors and ergonomics, biomedical devices and implants, and public policy



**Associate Professors**

Balkrishna C Rao	Sustainable manufacturing, sustainable design, nano-manufacturing, manufacturing for biomedical applications, simulation of manufacturing processes
Ganapathy Krishnamurthi	Medical image analysis, pre-clinical imaging systems-X-ray micro-CT, fluorescence imaging
Kavitha Arunachalam	Biomedical instrumentation, radio frequency and microwave antenna design, hyperthermia physics, non-destructive material evaluation
Palaniappan Ramu	Optimization, application of statistical and probabilistic techniques for engineering design under uncertainties, risk/reliability-based engineering design, surrogate-based modeling and analysis
Sandipan Bandyopadhyay	Robotics, dynamics of multibody systems, design

**Assistant Professors**

Tuhin Subhra Santra	Bio-nano/micro electro-mechanical systems (bio- NEMS/MEMS), biomedical micro/nano devices, bio-micro/nano fabrication, single cell technology, nanomedicine, biosensors and bioelectronics, bionanomaterials
Niravkumar Patel	Medical robotics, image-guided surgery
Srikanthan Sridharan	Electrified vehicle systems, modeling and control of power electronic converters and electric machine drives

**Short-term courses/workshops/seminars/symposia/conferences organised by the faculty members**

S. No.	Coordinator	Title	Period
<b>Workshop</b>			
1	Venkatesh Balasubramanian	Workshop on Data Driven Approach to Road Safety	Rajasthan, 17 December 2020; Uttar Pradesh, 2 February 2021
<b>Short-term Course</b>			
1	Venkatesh Balasubramanian	Design Thinking and Lean Ergonomics for Manufacturing Excellence	

**Short-term courses/workshops/seminars/symposia/conferences/trainings attended by faculty members in academic institutions and public sector undertakings**

S. No.	Faculty Member	Title	Institution	Period
<b>Workshop</b>				
1	Venkatesh Balasubramanian	National Seminar on Road Safety	State Governments - Rajasthan, Tamil Nadu, Maharashtra, Madhya Pradesh, Karnataka, Uttar Pradesh	16-18 February 2021
		Aligning the State Government for iRAD project induction		7-26 September 2020
		Training Rajasthan stakeholder departments in implementing Tamil Nadu model	Rajasthan State Government	17 December 2020

**Seminar**

1	Venkatesh Balasubramanian	National Seminar on Road Safety: Safer Road That Save Lives, Ranchi, Jharkhand		16-18 February 2021
		International Webinar on Crash Analysis and Road Safety (iCARS-2020)		10-12 December 2020
		National Road Safety Month, 2021	Ministry of Road Transport and Highways	18-19 January 2021

**Symposium**

1	Venkatesh Balasubramanian	National Symposium on Understanding the New Education Policy 2020	Sri Viswakarma Skill University	12 August 2020
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**Conferences**

1	Tuhin Subhra Santra	The 15th IEEE International Conference on Nano/Micro Engineered and Molecular Systems (IEEE-NEMS 2020)	San Diego, USA	26-30 September 2020
2	Ramanathan M	Eurographics & Eurovis 2020	Norrköping, Sweden	23-30 May 2020
		Shape Modeling International (SMI 2020)	Strasbourg, France	2-4 June 2020
3	Shankar Ram C S	7th International Workshop on Sustainable Road Freight	Online	28-30 October 2020

**Short-term Course**

1	Kavitha Arunachalam	Principles and Advances in Electromagnetism	IIT Madras	22-27 March 2021
2	Venkatesh Balasubramanian	A Roadmap to Road Safety: Rights and Duties	Police Training and Research Institute, Bhopal	11-16 January 2021

**Special lectures delivered by faculty in other institutions**

S. No.	Faculty Member	Topic of Lecture	Institution	Date
1	Saravana Kumar G	Optimising build parameters for additive manufacturing	International Conference on Applications in Computational Engineering, VIT, Chennai	30-31 October 2020
		Pedagogy of design thinking: experiences in conducting a product design course	FDP under ATAL scheme on Design Thinking, Sri Manakula Vinayagar Engineering College, Madagadipet, Puducherry	8-12 November 2020

		Computer vision and image analysis	2021 IEEE First International Conference on Advances in Electrical, Computing, Communications and Sustainable Technologies (IEEE ICAECT 2021), Shri Shankarachariyar Technical Campus (SSTC), Bhilai	19-20 February 2021
2	Tuhin Subhra Santra	Biomedical micro/nano devices for single-cell therapy and diagnostics	AICTE short-term course: Advances in Biomaterials and Tissue Engineering, IITM, Department of Biotechnology	25-30 January 2021
		Biomedical micro/nano devices for cellular therapy and diagnostics	International Webinar on Impact of Digital Revolution on Pharma and Healthcare (DIGIPH-2021), IEST, Shibpur	29 January-2 February 2021
			Nanomaterials and Devices: Physics and Applications, VIT Vellore	11-12 March 2021
3	Kavitha Arunachalam	Microwave non-Microwave non-destructive evaluation techniques and applications	NDE 2020 Virtual Conference and Exhibition on Non-Destructive Evaluation	10-12 December 2020
4	Shankar Ram C S	Safety and e-mobility of heavy road vehicles	University of the Witwatersrand, Johannesburg, South Africa	18 March

### Honours and awards obtained by faculty

S. No.	Faculty Member	Award	Awarded by	Awarded for	Date of Award
<b>i. Honours</b>					
1	Shankar Ram C S	V. Ramamurthi Faculty Fellow	IIT Madras	Research and teaching	Two years w.e.f. 1 October 2019
		Senior Member	IEEE	Academic service	June 2020
2	Tuhin Subhra Santra	Session Chair	15th IEEE International Conference on Nano/Micro Engineered & Molecular Systems	IEEE NEMS, San Diego, California, USA	September 2020
<b>ii. Awards</b>					
1	Soma Guhathakurta	Lifetime Achievement Award 2021	Indian Association of Cardio-Thoracic Surgeons	Successful CT surgeon at 50 came in with an idea to make a heart or valve	

2	Saravana Kumar G	IEEE MAS Best Researcher Award, for age category 40-50 for the year 2020	IEEE Madras Section Chennai	20 February 2021	
3	S.P. Anusha (lead author), Ph.D.; Lelitha Vanajakshi, Ph.D.; Shankar Subramanian, Ph.D. and Laurence Rilett, Ph.D., P.E., M. ASCE	Arthur M. Wellington Award	American Society of Civil Engineers		
4	Venu Srinivasan, PoP, ED	Deming Distinguished Service Award		Dissemination and Promotion from the Deming Prize Committee	

### Journal Editorial Boards

S. No.	Faculty Member	Position	Journal Name
1	Tuhin Subhra Santra	Guest Editor	<i>Journal of Micromachines</i> <i>Journal of Cells MDPI</i>

### 4.9.4. Design and Development Activities

#### Patents

##### Patents filed

S. No.	Faculty Member	Topic of Patent
1	Asokan T	A compliant mechanism based variable stiffness robotic grasper A multimodal three degrees of freedom haptic device
2	Jayaganthan R	A continuously variable valve duration mechanism for the internal combustion engine Linear and rotary actuator powered eight-wheeled all-terrain wheelchair Hybrid tube with an auxetic outer layer
3	Kavitha Arunachalam	Applicators for sequential delivery of MW hyperthermia and HDR brachytherapy
4	Nilesh Jayantilal Vasa	A material processing system and method thereof
5	Tuhin Subhra Santra	Process for intracellular delivery using TiO <sub>2</sub> micro flowers Method for formation of nanostructures on Az-31 (Mg-Alloy) and their uses thereof Massively parallel high throughput single cell optoporation Hanging drop cell culture followed by pulse laser assisted high throughput intracellular delivery

S. No.	Faculty Member	Topic of Patent
	Tuhin Subhra Santra	Functionally gradient three-layered graphene foam-polymer scaffold for periodontal regeneration
		TiO <sub>2</sub> Microspikes mediated photoporation for intracellular delivery
		Pulse laser activated optoporation based intracellular delivery using bone shaped gold nanostructures synthesized by microfluidic chip
		Infrared LED activated optoporation based intracellular delivery using TiO <sub>2</sub> nanotubes
		Nano-Second pulse laser-activated intracellular delivery using titanium micro-dish Substrate protein micropatterning process for cell alignment

### Patents awarded

S. No.	Faculty Member	Topic of Patent
1	Balakrishna C Rao	Development of a pedal-powered water filtration system
2	Srikanth Vedantam	Method of retrofitting and actuating variable profile cam for controlling lift and timing of engine valves
		Method for controlling lift of engine valves
3	Palaniappan Ramu Saravana Kumar G	Variable length of metal strap design: screw design
		Design of alternate water extraction mechanism in a vertical axis washing machine by the use of super- absorbent polymers
4	Sandipan Bandyopadhyay Saravana Kumar G	A human-powered device
5	Sandipan Bandyopadhyay	MaPaMan: A reconfigurable parallel manipulator
		An encoder mounting assembly
6	Venkatesh Balasubramanian	Novel resin matrix for dental composites with enhanced physical properties and biological response

### 4.9.5. Research and Consultancy

#### Sponsored research projects (ongoing and new)

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1	Implementation conditions for frugality in innovation processes	10 December 2020-9 December 2023	Volkswagen Foundation	0.00	Balakrishna Rao
2	Studies on selective laser melting of aluminium alloys for rapid prototyping of RF modules	25 November 2020-24 November 2023	Science and Engineering Research Board	10.05	R Jayaganthan

**Industrial consultancy projects (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Venkatesh Balasubramanian	Understanding current practices on road safety in selected states and sharing integrated approach of Tamil Nadu	Ministry of Road Transport and Highways	25.00
2	Srikanth Vedantam	Fatigue testing of polymer material systems	Saint-Gobain India Private Limited (Research & Development)	8.00

**RBIC projects (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Ganapathy Krishnamurthi Balaji Srinivasan	Identifying the right neural network techniques for 3D medical imaging	Intel Technology India Private Limited	29.88
2	Asokan Thondiyath	Design and analysis of wave glider	Defence Research and Development Organisation	9.16
3	Shankar Ram C S	Analysis of wheel misalignment in single unit trucks	Michelin India Technology Center Private Limited	34.49
4	Krishnakumar R	Indomethacin drug trial for COVID-19	Alumni Association	20.00
5	Kavitha Arunachalam, Ramanathan M, Krishnamurthy C V	Development of microwave hyperthermia device	Koshambh Multitred Private Limited	70.86
6	Saravana Kumar G	Research donation from Autodesk	Autodesk India Private Limited	9.28
7	Venkatesh Balasubramanian	Consultancy services for the development and implementation of Integrated Road Accident Database (iRAD)	Ministry of Road Transport and Highways, Government of India	424.8

**Faculty members' participation with other institution under MoU**

S. No.	Faculty Member	University/Institution
1	Dr R Krishna Kumar	Narayana Medical College and Sri Balaji Vidyapeeth, Puducherry
2	Venkatesh Balasubramanian	State Government of Rajasthan

**4.9.6. Other Activities of the Department  
A Faculty Search Committee has been formed.**

Department Degree Distribution Programme (D3P): A degree distribution programme was held on 12 November 2020 at 6 pm. Sriram Sivaram, Joint Managing Director, Madras

Engineering Industries Private Limited was the Chief Guest of the programme. Degrees, Ph.D. (12), M.S. (7) and DD (47) were awarded in person. The department had a get-together and interactions of the Chief Guest with the faculty, and graduands and their family members.

## 4.10. Department of Humanities and Social Sciences

### 4.10.1. Introduction

Founded in 1959, the Department of Humanities and Social Sciences is one of the oldest in Indian Institute of Technology Madras. The department's essentially inter-disciplinary nature is its distinguishing factor, which allows students to develop an appreciation for a diverse set of fields such as development studies, economics, English studies, environmental studies, history, international relations, philosophy, political

science and sociology. The department offers both Master's and Doctoral programmes, as well as electives for B.Tech and M.Tech students.

Coupled with its multi-disciplinary background, the department boasts of a highly diverse and experienced faculty. It has an excellent student-teacher ratio, providing opportunities for academically intense learning. Equipped with state-of-the-art facilities in a serene campus, the department offers an enriching academic environment.

### 4.10.2. Academic Programmes: Integrated M.A. (five-year programme)

#### New courses introduced

S. No.	Course No.	Title
1	HS6520	Culture and Development
2	HS6570	Food Cultures
3	HS7570	Historiography of Science, Technology and Medicine
4	HS6560	Introduction to Contemporary Tibet
5	HS6580	Indian Cultural Studies
6	HS4850	Astronomy in India
7	HS4860	Mathematics in India
8	HS4870	Climate Economics
9	HS3003	Globalization and Change
10	HS4100	German III

#### Students/Scholars who attended conferences/seminars/symposia abroad/India

S. No	Student/Scholar	Roll No.	Conference/Seminar/Symposia /Workshop	Date and Venue	Financial Assistance
1.	Varsha Gopal	HS17H007	Spatiality and Temporality -International Conference	6-7 February 2021, London Centre for Interdisciplinary Research	Self
2.	Ramnath Reghunadhan	HS18D022	International Online Lecture Series	15-24 December 2020, KPS Menon Chair for Diplomatic Studies, School of International Relations and Politics, Kottayam, Kerala	Self

3.	Jyoti Mishra	HS16D009	13th Annual International Conference on Mediterranean Studies	6-9 April 2020	Self
4.	Jyoti Mishra	HS16D009	Media Meet 2020	27-29 August 2020	Self
5.	Sancharini Mitra	HS17D004	Rethinking Women's Movement: Questions from Contemporary Contexts (Workshop)	17-28 August 2020, The Women's Studies Centre, Savitribai Phule Pune University	Self
6.	Sancharini Mitra	HS17D004	Oxford Women's Leadership Symposium (Virtual)	22-23 March 2021, Oxford Symposia	Self
7.	Irshad C V	HS17D016	Perceived Anxiety, Social Support and Coping Strategies of Elderly during COVID-19 Pandemic	22-26 February 2021, University of Kerala	Self
8.	Sayanty Chatterjee	HS15D026	Connections: Exploring Heritage, Architecture, Cities, Art, Media	29-30 June 2020	Self
9.	Praveen Parasar	HS18D026	Tarabai Modak Lecture Series on the Theme, Science and Society	9 June-2 July, TISS Mumbai	Self
10.	Praveen Parasar	HS18D026	The Return of Philosophy of Hegel - Conference	14-16 October 2020, Graduate School of Social Research, IFIS PAN and GOETHE Institute, Poland	Self
12.	K. Thamarai Selvan	HS17D018	SHOT (Society for The History of Technology)-ECIG Graduate Workshop	8 October 2020, SHOT Annual Conference	Participant Grant from Shot
13.	K Thamarai Selvan	HS17D018	Sound Instruments and Sonic Culture	14-18 December 2020, Science and Media Museum, Bradford	Self
14.	Rashi Shrivastava	HS18D028	Memory Studies Workshop	26-30 April 2021, Centre for Memory Studies, IIT Madras	Self
15.	Pratiti Palit	HS17D002	Linguistics For Life	1-3 June 2020, Department of Humanities and Social Sciences, IIT Kharagpur	Self
16.	Pratiti Palit	HS17D002	Sentence Novelty and Recursion by Probal Dasgupta; as a part of Syntax-Semantics: Theoretical Insights and Applications for Indian Languages seminar	22 July 2020, Centre for Applied Linguistics and Translation Studies, University of Hyderabad	Self
17.	Pratiti Palit	HS17D002	Boundaries of Caste	8 August 2020, Centre for Studies on Border and Movement	Self



**Students/Scholars who attended conferences/seminars/symposia abroad/India**

S. No.	Student/Scholar	Roll No.	Prize	Prize Awarded by
1	Chaithra A. Navada	HS16H024	Shastri Research Student Fellowship 2020-21	Indo-Shastri Canadian Institute
2	Ismail Siddiqui	HS18H020	Islamic Development Bank Undergraduate Scholarship for Development-Related Disciplines 2020-21	Islamic Development Bank
3	Ramnath Reghunadhan	HS18D022	Mira Sinha-Bhattacharjea Award	Institute of Chinese Studies, New Delhi

**Students/Scholars who won Institute Convocation/Institute Day Prize**

S. No.	Student/Scholar	Roll No.	Prize
1	Ashraya Maria MP	HS15H006	Dr V Ravikumar Memorial Prize 2020
2	Varsha Gopal	HS17H007	Institute Merit Prize

**4.10.3. Faculty and their specialisations****Faculty**

S. No.	Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>		
1	Jyotirmaya Tripathy, Ph.D. (IIT Kharagpur) <b>(Head)</b>	Culture and development, Contemporary India
2	Malathy Duraisamy, Ph.D. (Madras University)	Labour economics/econometrics, economics of education, industrial economics
3	Muraleedharan, V.R, Ph.D. (IIT Madras)	Healthcare policy, environmental health, technology and development, history of healthcare in South India
4	Sudhir Chella Rajan, Ph.D. (University of California)	Automobility, sustainability and political theory, social studies of corruption
5	Umakant Dash, Ph.D. (IIT Kanpur)	Financial economics, health policy analysis, economic evaluation of healthcare programmes and inter-industry analysis
6	Srilata K, Ph.D. (University of Hyderabad)	Creative writing studies, women's writing, Indian writing in English and translation
7	Aysha Iqbal Viswamohan, Ph.D. (Vikram University)	American literature, film studies and popular culture
8	Sreekumar N, Ph.D. (University of Hyderabad)	Philosophical and phenomenological hermeneutics, philosophies of Wittgenstein and Gadamer, bioethics
9	Dhanavel S.P., Ph.D. (Tripura University)	Literary studies, English language teaching, communication and soft skills
10	Swarnalatha R, Ph.D. (Madras University)	Ecocriticism, American literature

11	Suresh Babu M, Ph.D. (JNU, New Delhi)	Applied macroeconomics, industrial economics and trade and development
12	Rajesh Kumar, Ph.D. (University of Illinois)	Language in education, sociolinguistics, linguistic theory
<b>Associate Professors</b>		
13	Satya Sundar Sethy, Ph.D. (University of Hyderabad)	Philosophy of language, analytical philosophy and Indian philosophy
14	Sonika Gupta, Ph. D. (JNU, New Delhi)	Chinese domestic politics, foreign policy, international relations theory, Tibetan Exile Community in India
15	Subash S, Ph. D. (IIT Bombay)	Applied industrial economics, foreign direct investment, economics of innovation and technological change, small firms and industrial development
16	Roland Wittje, Ph.D. (NTNU Trondheim)	History of science and technology
17	John Bosco Lourdasamy, D.Phil. (Oxford University)	Plantation studies, history of S&T and medicine in Modern India
18	Milind Brahme, Ph.D. (JNU, New Delhi)	German language and literature, comparative literature and literary theory, education
19	Prema Rajagopalan, Ph.D. (IIT Kanpur)	Sociology of science and technology, sociology of development
20	Solomon J. Benjamin, Ph.D. (Massachusetts Institute of Technology)	Urban studies, world development
21	Sudarsan Padmanabhan, Ph.D. (University of South Florida and Pondicherry University)	Social and political thought, Indian philosophy and culture, philosophy of law
22	Anup Kumar Bhandari, Ph.D. (Indian Statistical Institute)	Industrial economics, applied econometrics, Indian banking and financial economics
23	Binitha V. Thampi, Ph.D. (ISEC, Bengaluru)	Gender and development, decentralisation and governance reforms, welfare state, poverty reduction policies and programmes
<b>Assistant Professors</b>		
24	Joe Thomas Karackattu, Ph.D. (JNU, New Delhi)	Economic interdependence and conflict, international relations
25	Kalpna, K., Ph.D. (MIDS)	Gender and development, women's studies and microfinance
26	Mathangi Krishnamurthy, Ph.D. (University of Texas at Austin)	Anthropology of work, medical anthropology, gender studies
27	Merin Simi Raj, Ph.D. (IIT Bombay)	Postcolonial studies, Indian fiction in English and literary historiography studies
28	Sabuj Kumar Mandal, Ph.D. (ISEC, University of Mysore)	Energy and environmental economics, applied econometrics, industrial economics
29	Santhosh Abraham, Ph.D. (University of Hyderabad)	Colonial psychiatry and institutions, colonial veterinary practices, law and society
30	Santhosh R., Ph.D. (ISEC, University of Mysore)	Sociology, globalisation and change
31	Tabraz S.S., Ph.D. (JNU New Delhi)	International relations theory, conflict resolution, international mediation and politics of west and South Asian regions

32	Hemachandran K, Ph.D. (Cambridge University)	Literary criticism and rhetoric, disability studies and comparative musicology
33	Santhosh Kumar Sahu, Ph.D. (IIT Bombay)	Industrial economics, energy economics, economics of global climate change
34	Anindita Sahoo, Ph.D. (IIT Delhi, New Delhi)	Linguistic typology, syntax, pragmatics
35	Divya A, Ph.D. (NTU, Singapore)	19th Century English fiction and visual culture; early modern English drama and Shakespeare; 19th century colonial writings on India; colonial picturesque and company paintings; gender studies; Children's literature
36	Avishek Parui, Ph.D. (Durham University)	Modernism, masculinity studies, memory studies, posthumanism
37	Vipin Pudiyaadath Veettil, Ph.D. (George Mason University)	Monetary economics, production networks, macroeconomics, agent-based modelling
38	Aditya Sri Ram Kolachana, Ph.D. (IIT Bombay)	History of mathematics, astronomy of India

**Visiting Faculty**

39	Yuan Hsiao-Hui	Mass media, Chinese language
40	Christoph Woiwode, Ph.D. (University of London)	Sustainable urban development, social transformation to sustainability, climate change, disaster risks, governance

**Short-term courses/workshops/seminars/symposia/conferences organised by the faculty members**

S. No.	Coordinator(s)	Title	Period
<b>Conference</b>			
1	Joe Thomas Karackattu	13th All India Conference of China Studies (AICCS), organised jointly by the Institute of Chinese Studies, New Delhi and IIT Madras China Studies Centre	28-30 January 2021
<b>Seminars</b>			
1	Christoph Woiwode	Inner Transformation for Sustainable Urban Futures: Need for a New Paradigm	25 June 2020 (online event)
		The City and Its Regions	4, 11, 18, 25 September 2020 (online event)
2	Sudarsan Padmanabhan	Food Security: Retrospect and Prospects	14 August 2020
		Gandhi in the 21st Century	21 August 2020
		Halfdan Mahler in India 1951-61	27 August 2020
		Emerging Trends in Smart Manufacturing	18 September 2020
		Universal Health Coverage in India	1 October 2020
		Designed for Independence	2 October 2020
		Wastewater Management in the 21st Century	3 October 2020
		Sustainable Water and Waste Management in Villages	4 October 2020
		Building-integrated Cooling Systems for the Hot and Humid Climate	16 October 2020
		Teaching Writing Virtually	19 November 2020
		The Write Thoughts	13 December 2020

3	Joe Thomas Karackattu	Initiated the flagship Research Frontiers (RF Talks) webinar series with Prof William Callahan, LSE, on 'Exploring the visual turn in international relations and area studies research'	20 October 2020
		Organised the Research Frontiers (RF Talks) webinar on the theme of "China's plan in times of COVID-19 and Cold War 2.0," with Prof Bert Hofman, Director of the East Asian Institute at NUS, and Professor of Practice at the Lee Kuan Yew School, NUS, Singapore	10 November 2020

**Symposia**

1	Christoph Woiwode	4th Indo-German Dialogue on Green Urban Practices: The human being in sustainability transformations	26-27 November 2020 and 3-4 December 2020 (online event)
2	Joe Thomas Karackattu	Initiated the flagship Foreign Policy Conversations (FPCs) webinar series with a Webinar on 'The geopolitics and economics of COVID-19: views on China and the world' (Resource persons from Oxford University, HKU, NUS, JNU, IES, chiefly)	8 May 2020

**Workshops**

1	K Srilata	Haiku Workshop	12 October 2020
2	K Srilata	Plurilingual Poetry workshop	19 October 2020
3	Binitha V Thampi	Research methodology for young professionals for Kudumbashree NRO, Government of Kerala	September-December 2020
5	Sudarsan Padmanabhan	3rd Kenyon - IIT Madras Writing Workshop	13-18 December 2020
6	Mathangi Krishnamurthy	To Be Continued - IIT Madras and South Asian University	August-December 2020
7	Sonika Gupta	Talking Himalayas: Workshop on Disciplinary Approaches and Methods	18-20 February 2021

**Short-term Courses**

1	Avishek Parui and Merin Simi Raj	Memory Studies	26-30 April 2021
2	Christoph Woiwode	IGCS Summer School 2020 "Sustainable Smart Cities: Focus on Mobility"	5-16 October 2020 (Online event)

**Short-term courses/workshops/seminars/symposia/conferences/trainings attended by the faculty members in academic institutions and public sector undertakings**

S. No.	Faculty Member	Title	Institution	Period
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**Workshops****International**

1	Roland Wittje	DEMA Workshop II: Doing Performative Experiments in Media Archaeology	University of Luxembourg (online)	18 December 2020
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**National**

1	Aysha Iqbal Viswamohan	Exploring Heritage, Architecture, Cities, Art Media	University of Kent, UK	29-30 June 2020
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S. No.	Faculty Member	Title	Institution	Period
2	Binitha V Thampi	Exploring Issues and Solutions for Resolving Housing Challenges of Migrant Workers in Kochi Corporation, Kerala	University of Reading, UK and the Corporation of Cochin	November 2020
3	S.S. Sethy	Identification of a Research Problem and Formulation of Hypotheses for a Research Study	Human Resource Development Centre, Kannur University, Kerala	12 June 2020
4	Joe Thomas Karackattu	Collating History Resources for Teachers in Higher Education, invited by the National Resource Centre for Education to identify History Resources for Teachers in Higher Education, NIEPA	National Institute of Educational Planning and Administration (NIEPA), New Delhi	8-9 October 2020
<b>Seminar/Symposium</b>				
1	Roland Wittje	Gestión del patrimonio universitario: Proyecciones, alianzas y redes	Universidad de Oriente, Cuba (online)	11 November 2020
<b>Conferences</b>				
<b>International</b>				
1	Aditya Kolachana	International Web-Conference on History of Mathematics	Indian Society for History of Mathematics	20-22 December 2020
2	Roland Wittje	XXXIX Scientific Instrument Symposium	Science Museum London and Royal Museums Greenwich (online)	14-18 September 2020
		Sound Instruments and Sonic Cultures: An Interdisciplinary Conference	National Science and Media Museum, Bradford, UK (online)	15-16 December 2020
3	Christoph Woiwode	Invited panellist, Addressing Climate Risks through Planning in Growing Cities	United Nations University - EHS in collaboration with ICLEI World Secretariat, Bonn, as part of Daring Cities 2020 Event	9 October 2020
4	Binitha V Thampi	Aspects of Migration and Mobility	India Migration Centre, Ministry of External Affairs, GOI	December 2020
<b>Short-term Courses</b>				
1.	Roland Wittje	Srishti Winter School, The Public Lives of Objects	Center for Public History, Srishti Institute of Art, Design, and Technology	10-21 February 2021

**Special lectures delivered by the faculty in other institutions**

S. No.	Faculty Member	Topic of Lecture	Institution	Date
<b>National</b>				
1	Aditya Kolachana	Mathematics in India	Vijnana Bharati	28 October 2020
		Mathematics in India	Vigyan Prasar	10 November 2020
2	Anindita Sahoo	Blended Learning: Futuristic Teaching Process	IPS Academy, Indore	9 December 2020
		Linguistic Inputs for Better Communication	Krishna Engineering College, Ghaziabad	27 July 2020
		Encoding, Effacing and the Phenomenon of Forgetting	University of St. Andrews, UK	18 November 2020
		Research Conversations in Memory Studies	Frankfurt Memory Studies Platform, Goethe University, Germany	24 November 2020
		Reading Group and Research Conversation	Memory Group, University of Warwick	7 December 2020
		Literature and Memory Studies: Interdisciplinary Possibilities	Manipur University of Culture	10 October 2020
		Memory Studies and Postcolonial Identities	Assam University	27 September 2020
		Workshop on Memory Studies	Banaras Hindu University	12 August 2020
		Memory Studies: Research Possibilities	Bidhan Chandra College	6 July 2020
		A four-day e-workshop on Research Methodology and Academic Writing	St. Xavier's College for Women, Kerala	24 July 2020
		Humanities Beyond Disciplines	Sahitya Akademi	18 July 2020
New Normal and New Literary Trends	Sammilani Mahavidyalaya	25 July 2020		
3	Avishek Parui	Anxious Masculinities: Re-Reading Hamlet and Look Back in Anger	Egra S.S.B. College	30 June 2020
		Literature and Medicine: Research Possibilities in Medical Humanities	Barabazar Bikram Tudu Memorial College	23 June 2020
		Masculinity and Imperial Performance in George Orwell's Shooting an Elephant	Royal Global University, Guwahati	3 June 2020
		Literature and Epidemic	Bhavnagar University, Gujarat	16 May 2020
		Intergenerational Memory and Diasporic Identities: A Reading of Sunil Gangopadhyay's Purba Pashchim	Midnapore College	13 May 2020

	Avishek Parui	'The New Normal' Virtuality, Personal Branding and Humanities Education in The Post-Covid 19 World	VIT Chennai	20 July 2020
4.	Aysha Iqbal Viswamohan	Classic Versus New Hollywood Cinema webinar	Central University of Kerala Kasargod	5 June 2020
5.	Dhanavel, S. P.	Race, Class, Gender, and Sexuality in Poetry (Refresher Course)	University of Madras	27 April 2020
		Public Speaking and Presentation Skills (online special lecture)	Bharathiar University, Coimbatore	31 October 2020
		English as a Second Language in a New Key (online special lecture)	English and Foreign Languages University, Hyderabad	20 November 2020
		Technical Communication for Professionals (International Virtual Conference)	K. L. University, Vijayawada	12 December 2020
6.	Jyotirmaya Tripathy	Introduction to Humanities Research	NIT Karaikal	17 December 2020
		Team Management Skill	IIT Bhubaneswar	5 November 2020
		Art, Culture and Nationalism	Central University, TN	11 September 2020
		Approaching Cultural Studies	North Odisha University	18 July 2020
		The Road to Critical Theory	North Odisha University	11 July 2020
		IITs and the Quest for Nationhood	Integrated Talent Development Mission	13 June 2020
7.	Milind Brahme	Planting a Second Soul: Some Reflections on Teaching and Learning a Foreign Language	AMITY University, Kolkata	22 July 2020
		Perspectives on Online Education	Roja Muthiah Research Library Chennai	19 August 2020
8.	Rajesh Kumar	Socio-Cultural Dynamics of the Languages of Bihar	EFL University, Hyderabad	29 October 2020
9.	Roland Wittje	The Singing Arc and the Speaking Arc	University of Luxembourg (online)	18 December 2020
		Das elektroakustische Zeitalter: Elektro-analoge Technologien, Forschungspraktiken und Denkweisen	University of the Arts, Berlin (online)	30 November 2020
		Los objetos y colecciones de la educación e instrucción en la historia de la ciencia y tecnología	Universidad de Oriente, Cuba (online)	11 November 2020
		Reflections on Visiting the Hindustan Machine Tool Factory and Museum	Center for Public History, Srishti Institute of Art, Design, and Technology	14 February 2021



10.	Swarnalatha Rangarajan	The Greening of Theory: The Eco-Ontological Literary Imperative in the Anthropocene; invitation to act as Resource Person at the online lecture series of the Department of English (UG & PG)	Department of English (UG & PG), Berhampore Girls' College, West Bengal	28 August 2020
		Keynote Lecture: Writing the Earth Darkly, 2nd RSRI Conference on Contemporaneity of Language and Literature in the Robotized Millennium (RSRI CCLLRM 2020)	SRM Institute of Science and Technology, Ramapuram Campus	23-24 September 2020
		Keynote Lecture: "'Nature' to 'nature': Ecocriticism and the Anthropocene Imperative" in a conference on Ecocriticism: Theory and Praxis	Department of English, Ramakrishna Mission Residential College, Narendrapur	6-12 January 2021
		Plenary Lecture: Narrating the Anthropocene Mesh at the National Webinar on Literature in the Times of Corona Virus: An Ecological Perspective	St. Thomas College, Thrissur	22 March 2021
11.	Subash S	"FDI, Technology and Trade" and "Small Firms and Industrial Development in India"	JNU	9 March 2021
		Entrepreneurs Mindset and Business Strategies for MSMEs During COVID-19	TANSTIA-TFSC 29th Annual Day, Chennai	26 August 2020
12.	Solomon Benjamin	Occupancy Urbanism Spatial Practices Beyond Resistance and Rescue	City + Regional Planning Berkeley USA	12 February 2021
		Popular Economies: Spatiality Beyond Cartography	University of Sheffield, UK School of Urban Popular Economy	December 2020
		On Categories and Narratives When Corona Opens a Life Space	University of Sheffield, UK, School of Urban Popular Economy	9 September 2020
13.	Binitha V Thampi	Feminist Labour Politics in the Neo-Liberal Era: A case of Munnar Labour Protests in Kerala	School of International Relations and Politics, Mahatma Gandhi University, Kerala	16 December 2020
		Examining Feminism and Social Realities	Darshana Webinar: A Cultural Collective of Engineers	7 November 2020
		Social Impact of COVID-19 Pandemic	Kannur University, Kerala	16 May 2020
		Digital Transformation and Online Learning	AKPCTA - An association of college teachers from Kerala	8 May 2020



14.	K S Kannan	Śivānandalaharī: Gāna-Vyākhyāna	Advaita Academy	23 May 2020
		The Kāraka Theory - First of the Prof. S.A. Dange Memorial e-Lecture Series	Kavikulaguru Kalidas Sanskrit University, Ramtek	7 June 2020
		The Beauty of the Nāndī Verses of Kālidāsa	Indian Institute of World Culture, Bangalore	16 July 2020
		Significance and Future of Sanskrit Studies and Allied Areas	IIT Roorkee	27 September 2020
		Amarakośa - The Original Thesaurus	Indian Institute of World Culture, Bangalore	10 October 2020
		Atomic Habits	Indian Institute of World Culture, Bangalore	21 November 2020
15.	Mathangi Krishnamurthy	Engendering the Body: A Broad Review of the Body in Feminist Theory	Assam University, Silchar	13-14 August 2020
16.	Satya Sundar Sethy	Integrating Professional Ethics into Assessment Practices for Students' Inclusive Learning	Loyola College of Education, Nungambakkam, Chennai	9 November 2020
		Professional Ethics in Research and Teaching Practices in Higher Education Settings	Department of Education, Central University of Kerala, Kerala	29 April 2020
17.	Sreekumar N	Crisis in Medical Sciences: Philosophical and Bioethical Analysis		15 June 2020
		Philosophical Reflections on Interdisciplinary Research	Nirmala College, Chalakudi, Kerala	19 August 2020
		Philosophical Hermeneutics and the Idea of "Good"	Government College for Women, Thiruvananthapuram	12 March 2021
		The Question of Truth in Philosophical Hermeneutics	Annamalai University	25 March 2021
18.	Sonika Gupta	State of China Studies in India	Institute of Chinese Studies	30 January 2021
19.	Joe Thomas Karackattu	<i>Those 4 Years</i> : A journey into the lives of the Chinese who came to India around the middle of the 19th century	Sorbonne Université, Paris	18 February 2021
		Screening of <i>Those 4 Years</i> and Q&A with the Director	Hong Kong Baptist University	25 January 2021
20.	K Kalpana	Future of Banks and Bankers: Expectations of Women	Organised as part of Webinar Series on Finance: Financing India's Future, by CFA India (Centre for Financial Accountability)	4 September 2020
		SHGs - Potential for transitioning them to Respond to Gender Based Violence (GBV)	Seminar Series on 'Elimination of Violence against Women' organised by Government of Tamil Nadu, UN Women, UNICEF and State Development Policy Council	10 December 2020

21.	Umakant Dash	Plenary speaker and delivered a lecture on “Global Pandemic Outbreak: Role of Social Scientists” in the International Virtual Conference	Department of Liberal Arts and Department of Visual Communication, Hindustan University, Chennai	19 June 2020
		Resource Person in the National Webinar conducted by the Department of Economics and delivered a lecture, Health Economics Research during Pandemic: Early Experience from COVID 19	Vivekananda College, Tiruvedakam West, Madurai District 625 234, Tamil Nadu	21 September 2020

### Honours and awards obtained by faculty

S. No.	Faculty Member	Award	Awarded by	Awarded for	Date of Award
<b>i. Honours</b>					
1.	Avishek Parui	Nominated to be the Member of Advisory Board	International Memory Studies Association	The efforts to network the growing field of Memory Studies in India and transnationally, with excellent scholarly contributions	16 February 2021
2.	Binitha V Thampi	Member, Board of Studies	MG University, Kerala		December 2020
3.	K S Kannan	Member, Jury for World Sanskrit Award (International)	ICCR, Ministry of Education, Government of India		2 November 2020
<b>ii. Awards</b>					
1.	Anup Kumar Bhandari	Scholarship for faculty members from academic institutions	Reserve Bank of India	Carry out independent research for three months	1 December 2020
2.	Dr Joe Thomas Karackattu	Young Faculty Recognition Award 2020	IIT Madras	Excellence in Teaching and Research	7 September 2020

### Fellowships of academies and professional societies

S. No.	Faculty Member	Year of Admission
1.	Swarnalatha Rangarajan, Chairperson, Board of Studies (English), Tamil Nadu Open University	2020
<b>Others</b>		
1.	Joe Thomas Karackattu invited to serve Network Editor for H-Asia (ongoing); H-Asia is part of H-Net: Humanities and Social Sciences online (based at Michigan State University; one of the largest platforms for research and networking in Humanities and Social Sciences with over 2,00,000 subscribers)	2016

**Journal Editorial Boards**

S. No.	Faculty Member	Position	Journal Name
1.	Aditya Kolachana	Member	<i>History of Science in South Asia</i>
2.	Avishek Parui	Editorial Board Member	<i>Anthem Press</i>
		Editorial Board Member	<i>Rupkatha Journal on Interdisciplinary Studies</i>
3.	Jyotirmaya Tripathy	Advisory Board Member	<i>International Quarterly for Asian Studies</i>
4.	Rajesh Kumar	Associate Editor	<i>Language and Language Teaching</i>

**4.10.4. Research and Consultancy****Sponsored research projects (ongoing and new)**

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1.	Estimating economic cost of environmental degradation related to municipal solid wastes and its restoration: a study in Aizawl, Mizoram	16 March 2020-15 March 2021	Government of Mizoram	12.00	Sabuj Kumar Mandal
2.	Managing COVID-19 in India's cities: reshaping people's everyday lives in poorer urban neighbourhoods	1 January 2021-31 December 2022	University of Sheffield	10.22	Binitha V Thampi
3.	Memory studies and Anglo-Indian identities: The Digital Archive Project	15 March 2021-14 March 2023	Anglo-Ink	10.00	Merin Simi Raj
4.	Vulnerability of coastal infrastructure due to climate change in east coastal zones of India: An integrate assessment modelling approach	23 March 2018-22 March 2023	Department of Science & Technology	47.97	Sudhir Chella Rajan
5.	Centre for Technology and Policy (CTaP) - Phase II	28 November 2018-27 November 2023	Ministry of Education	112.96	Muraleedharan V R
6.	PERI-CENE (Peri-urbanization and Climate-Environment Change)	23 September 2019-22 September 2021	Department of Biotechnology	107.97	Sudhir Chella Rajan

**Industrial consultancy projects (ongoing and new)**

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1.	Cities, Amenities and Global Production Chain in East Asia: India Case Study	1 April 2019-30 April 2021	Economic Research Institute for ASEAN and East Asia (ERIA), Jakarta, Indonesia	8.60	Subash S
2.	Strengthening public hospitals using PMJAY fund	18 September 2020-17 July 2021	World Health Organisation	33.88	Umakant Dash
3.	Process evaluation of AB-PMJAY in Uttar Pradesh	20 August 2020-15 December 2020	ACCESS Health International	15.58	Umakant Dash
4.	Evaluation of women empowerment programme	2 September 2020-31 December 2020	Hand In Hand India	13.69	Sureshbabu M
5.	Research framework/ protocol and tools to assess pilots on expanding coverage to the "Missing Middle" in India	1 November 2020-31 March 2021	Health Systems Transformation Platform	15.53	Umakant Dash
6.	Animated agents, virtual reality, and cognitive theory: A case study of Marks & Spencer 360-degree procedural training	3 November 2020-5 February 2021	Tata Consultancy Services Limited	1.00	Avishek Parui
7.	Global market entry, survival, and exit of firms: understanding the process and the effects	16 November 2020-31 July 2021	Economic Research Institute for ASEAN and East Asia (ERIA)	5.84	Subash S
8.	ERIA Research on COVID-19: the role of digitalization in shaping India's global value chain participation	16 November 2020-21 April 2021	Economic Research Institute for ASEAN and East Asia (ERIA)	6.57	Subash S
9.	Lancet Global Health Commission Financing Primary Health Care	1 November 2020-31 March 2021	London School of Hygiene and Tropical Medicine	19.84	Muraleedharan V R
10.	Use of open-source data for strengthening SDG monitoring in Tamil Nadu	1 January-30 April 2021	German Development Cooperation	7.43	Suresh Babu M
11.	Green Growth Index, energy use and economic growth: evidence from the United Arab Emirates	1 March 2021-24 June 2022	Abu Dhabi University	5.10	Santosh Kumar Sahu
12.	Panelist - Kudumbashree NRO, Government of Kerala	7 September 2020-7 September 2021	Kudumbashree Kerala State Poverty Eradication Mission	0.60	Binitha V. Thampi
13.	Creating proficiency in English	1 April 2019-30 March 2022	Fullerton India Credit Company Limited	54.38	Rajesh Kumar
14.	AI and ethics for the Indian context	28 October 2019-31 October 2021	Robert Bosch Centre for Data Science and Artificial Intelligence	10.00	Sudarsan P.

15.	Gender ideology, father involvement, and gender discrimination	1 June 2019-31 May 2021	Penn State University	6.94	Binitha V. Thampi
16.	Handwash and dental hygiene habits: a behaviour change study in Tamil Nadu schools	1 August 2019-25 June 2021	University of California Berkeley, USA	4.83	Malathy D.

#### Exchange programme with other universities, including institutions/universities under MoU

1. R Santosh: ASEM DUO Visiting Fellowship for academic exchange with Prof. Filippo Osella, Department of Anthropology, Sussex University, UK
2. Jyotirmaya Tripathy: ASEM DUO Visiting Fellowship for academic exchange with Prof. Uwe Skoda, School of Asian Studies, Aarhus University, Denmark
3. Sudarsan Padmanabhan: ASEM DUO Visiting Fellowship for academic exchange with Prof. Niels Brimnes, Department of History, Aarhus University, Denmark.

#### Faculty members' participation with other institution under MoU

S. No.	Faculty Member	Participation Details	University/Institution
1.	Avishek Parui	Public lecture	University of St. Andrews, UK

#### 4.10.5. Other Activities of the Department

##### Socially relevant activities carried out by the department

1. COVID-19 outbreak and the micro, small and medium enterprises (MSMEs): A study of Tamil Nadu was conducted by Dr Subash S and Dr Santosh Kumar Sahu of Department of Humanities and Social Sciences, Indian Institute of Technology Madras and RK Jeyabalan of ConsoTree. This study provides evidence on how MSME enterprises are impacted and resilient to the lockdown imposed due to the COVID-19 crisis in the state. To understand the impact, data has been collected from more than 1,200 MSMEs belonging to manufacturing, trading and services from the 36 districts of Tamil Nadu. This voluntary study was carried out in collaboration with three major MSME associations in Tamil Nadu, TANSTIA, CODISSIA and MADITSSIA. The final report was released by the Honourable Minister of Industries, Tamil Nadu on 7

July 2020.

2. Sudarshan P coordinated New India Internship, 15 December 2019-15 January 2020, Office of Dean Students, IIT Madras

3. Sudarshan P performed as Faculty Anchor, SIDDHI Webinar Series, Office of Global Engagement, IIT Madras

##### International collaboration achievements by the department

The Department of HSS signed an MoU with Nordic Centre of India, New Delhi, which is a consortium of Nordic universities. The department also entered into an agreement with Korean Foundation for the introduction of Korean Language Literature courses taught by a Korean faculty.

#### Student visit

S. No.	Students	Roll Number	Purpose of Visit	Period of Visit	Venue
1	Rasika Rajendra Joshi	HS17H011	DAAD Semester Exchange Programme	February-August 2020	Hochschule Bremen, Germany
2	Taneesha Shekhawat	HS17H034			
3	A Manjith Nair	HS17H044			

## 4.11 Department of Management Studies

### 4.11.1. Introduction

The Department of Management Studies (DoMS) was set up in April 2004. The department offers a two-year full-time M.B.A. programme (started in July 2001), a two-year Executive MBA for working professionals and research programmes leading to M.S. and Ph.D. degrees. DoMS also offers TechMBA as a dual degree option for the engineering graduates of IIT Madras. In addition, the Department offers the Visionary Leadership in Manufacturing (VLM) programme and

the Postgraduate Diploma for Executives (PGPEX-VLM), jointly with IIM Calcutta and IIT Kanpur.

Over the years of its existence, the department has thoroughly revised its MBA programme curriculum, expanded its research activities, re-launched the M.S. (Entrepreneurship) programme with a new structure and worked towards establishing long-term relationships with globally reputed institutions and organisations.

Some major areas of research at the department are listed here:

- Applied statistics
- Combinatorial optimisation
- Finance
- Human resource management
- Information systems
- Knowledge management
- Marketing
- Models in supply chain management
- Production and operations management
- Project management
- Quality management
- Strategy and business policy
- Services management
- Technology management

### 4.11.2. Academic Programmes New courses introduced

S. No.	Course No.	Title: Project Appraisal and Financing
	MS5616 by Dr R. Mathumathi	<p>Aim: The purpose of this course is to develop competencies and skills for planning, financing and assessing projects' performance. The course prepares students on the practical aspects of project financing both from the point of view of an entrepreneur availing project finance and as an investment banker appraising projects for financing.</p> <p>Course content</p> <ol style="list-style-type: none"> <li>1. Project Fundamentals: Features, identification and lifecycle, assessment and appraisal of promotes and management, market analysis and appraisal-demand forecasting, product pricing decisions</li> <li>2. Technical Analysis and Appraisal: Technology and knowhow selection, infrastructural facilities and inputs of production</li> <li>3. Financial Analysis and Appraisal: Assessment of cost of project, sources of project finance, capital subsidies and incentives available to new projects and taxation, capital structuring and arranging means of finance, project financing in India-schemes of assistance-term loans procedures-project appraisal by financial institutions.</li> <li>4. Projected Financial Statements: Overall financial evaluation risk management in project finance, project report, institutional risk assessment and financing decision</li> <li>5. Project management, overruns and post-completion performance evaluation, issues in infrastructure financing, environmental impact assessment, social cost benefit analysis</li> </ol>

**Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021**

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
M.B.A.	69	60	-	-	-	129
E.M.B.A	49	43	-	-	-	92
techMBA	-	-	10	-	-	10
V.L.M.	40	-	-	-	-	40
M.S.	6	13	4	5	6	34
Ph.D.	15	30	20	20	58	143
<b>Total</b>	<b>179</b>	<b>146</b>	<b>34</b>	<b>25</b>	<b>64</b>	<b>448</b>

**Student/Scholar, who attended conference/seminar/symposia abroad/India**

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposia/Workshop	Date and Venue	Financial Assistance
1.	Anushee Jain	MS18S008	Oral presentation at the POMS Annual Conference 2020 on "A mixed integer liner programming model for a real-life deterministic inventory and transportation problem"	23-27 April 2020, Minneapolis MS, USA	Institute

**Students/Scholars who won outside prizes and awards**

S.No.	Student/Scholar	Roll No.	Prize	Prize awarded by
1	Srivatsa Srinivas S	MS15D400	Institute Research Award 2019-20 Merit Certificate contains cash Prize of Rs.20,000	IIT Madras
2	Anu Mary Chacko	MS16D203	Best Doctoral Research Paper Award at NCSM-2020 for paper, Impact of B2B salesperson's social media usage on buyer intelligence collection—a conceptual framework	In association with Pi Sigma Epsilon (PSE) National Educational Foundation, US
3	Ashis Goel	MS16D004	Institute Research Award 2019-20 for exemplary research work	IIT Madras
4	Sharon Christina Tensingh	MS15D200	Best Paper Award to paper, Dynamic interlinkage among arbitrage, hedging and speculation in crude oil futures market. The paper has been judged as one of best three research papers (third place).	NSE Research Scholar Program of National Stock Exchange of India Limited (NSE) 2020

**4.11.3. Faculty and Their Specialisation****Faculty**

Name and Qualifications	Major Areas of Specialisation
Head	Dr G. Arun Kumar
Professors	15
Associate Professors	7
Assistant Professors	2
Visiting Faculty	
Ajit Singhvi Chair Professor	1
Professor of Practice/Emeritus Professor	1



**Short-term courses/workshops/seminars/symposia/conferences organised by faculty members**

S. No.	Coordinator(s)	Title	Period
<b>Conference</b>			
1.	Dr R. K. Amit and Dr Debasis Mishra	Contributions of Paul Milgrom and Robert Wilson to Auction Theory: Nobel Prize 2020 for Economics	20 November 2020, Online
<b>Symposium</b>			
1.	Dr Arshinder Kaur, Dr Saji Mathew and Dr Vijayalakshmi	IIT Madras DoMS Research Symposium 2021 on Learn, Inspire and Grow	18-19 March 2021, Online

**Visits abroad by faculty**

S. No.	Faculty Member	Country Visited	Date	Purpose of visit	Funding from
1.	Dr Richa Agrawal	Columbia University New York	12 July-15 December 2021	To visit the Columbia Entrepreneurship Design Studio	Project fund
2.	Dr C. Rajendran	USA	19 October- 10 November 2020	Private Visit	Without institute financial assistance
3.	Dr C. Rajendran	USA	22 December 2020-12 February 2021	Private visit	Without institute financial assistance

**Honours and awards obtained by faculty**

S. No.	Faculty Member	Award	Awarded by	Awarded for	Date of Award
<b>i. Honour</b>					
1.	Dr C. Rajendran	Global recognition research is among the top 0.3% in India			
<b>ii. Awards</b>					
1.	Prof. M Thenmozhi	India's Top 100 Women in Finance 2020	Association of International Wealth Management of India (AIWMI)		
2.	Dr M. Thenmozhi	Best Paper Award: Paper, Dynamic interlinkage among arbitrage, hedging and speculation in crude oil futures market, has been judged as one of best three research papers (third place)	NSE Research Scholar Program of National Stock Exchange of India Limited (NSE) 2020	Prize includes an award of Rs.20,000	
3.	Dr A. Thillairajan	Associate of the Mossavar-Rahmani Center for Business and Government	M-RCBG, Harvard Kennedy School for a second year		1 February 2020-31 January 2021



#### 4.11.4. Design and Development Activities

##### Brief and specific details of process/instruments/equipment/software designed and developed

Prof. A. Thillai Rajan took the initiative and helped in conceptualising and setting up of the innovation, Venturing and Entrepreneurship in India (IVEIN) Network comprising IITM, IITB, IIMB, IIMC and IIMK.

#### 4.11.5. Research and Consultancy

##### Faculty members' participation with other institution under MoU

S. No.	Faculty Member	Participation Details	University
1.	Dr Thillai Rajan A	Reappointment as Associate, Mossavar-Rahmani Centre for Business and Government (1 February 2021-31 January 2022)	Harvard Kennedy School, Harvard University

#### Distinguished visitors to the department

S.No.	Visitor and Designation	Date of Visit	Purpose of Visit
1.	Rajdeep Datta, Director- Compliance Operations, Amazon	27 September 2020, Webex	Talk: New trends in operations management
2.	Lakshmi Iyer, President, CIO-Debt and Head-Products, Kotak Mahindra Asset Management & Co	10 November 2020, Webex	Talk: Investment opportunities in current times
3.	Debangshu Adhikari, Head of Operations, Reliance Digital Retail Limited	13 December 2020, Webex	Talk: Stepping into 2021—change in business models, the lessons learnt, and the opportunities created
4.	Avik Sarkar, Ex-Head of Data Analytics Cell, NITI Aayog, Government of India	16 January 2021, Webex	Talk: AI applications in healthcare and ethical aspects
5.	Gowthamram Nallan, Senior Solutions Consultant, Adobe	20 February 2021, Webex	Talk: Digital customer experience—why it is a matter of survival for every business
6.	Sanjay Rughani, CEO, Standard Chartered Bank, Tanzania	27 March 2021, Webex	Talk: Essentials of networking—how to network and expand your personal potential
7.	C. K. Ranganathan, Chairman and Managing Director, Founder Chairman of Cavinkare Private Limited and Chairman, CII Southern Region	30 March 2021, Webex	Lecture: Business challenges in pre and post COVID—prospects and future ahead

#### 4.11.6. Other Activities of the Department

##### Major infrastructure development made in the department

Virtual notice board: DoMS proudly announced that its scholars designed three virtual notice boards to share their publications, etc., that are given with DOI/URL so that anyone can view the work done by them.

## 4.12 Department of Mathematics

### 4.12.1. Introduction

The Department of Mathematics was established in 1959 along with the institute. It offers M.Sc. programme in Mathematics, M.Tech. programme in Industrial Mathematics and Scientific Computing (IMSC), and Ph.D. programme. In addition, the department has taken the responsibility of teaching mathematics courses to B.Tech., M.Tech. (other than IMSC), M.Sc. and Ph.D. students at the institute.

The major research areas of the department are the following:

1. Algebraic combinatorics
2. Algebraic geometry
3. Algebraic topology
4. Applied probability
5. Approximation theory
6. Category theory
7. Combinatorial optimization
8. Combinatorics
9. Combinatorics of words equations
10. Commutative algebra
11. Complex analysis
12. Conformal geometry
13. Contact and symplectic topology
14. Convective heat and mass transfer
15. Computational fluid dynamics
16. Computational number theory
17. Cryptology
18. Differential and integral equations
19. Differential topology
20. Fixed point theory
21. Fluid mechanics
22. Functional analysis
23. Fractals
24. Game theory
25. Graph algorithms
26. Graph theory
27. Harmonic analysis
28. Inverse and ill-posed problems
29. Linear algebra
30. Low-dimensional topology
31. Mathematical modeling
32. Mathematical study of ferromagnetic networks
33. Nonlinear analysis
34. Nonlinear analysis of functional differential
35. Nonlinear differential equations
36. Number theory
37. Operator algebras
38. Operator equations
39. Operator theory
40. Optimization
41. Partial differential equations
42. PDE numerics
43. Solid mechanics
44. Special functions
45. Systems and control theory
46. Theory of codes
47. Theory of computation
48. Theory of wavelets
49. Time frequency analysis
50. Wave structure interactions

### 4.12.2 Academic Programmes

Students on roll as of September 2019+ Ph.D. admission in January 2020

Programme	Number of Students
M.Sc.	77
M.Tech.	43
Ph.D.	112
Total	232

### 4.12.3. Faculty and Their Specialisations

#### Faculty

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Dr A.K.B. Chand, Ph.D. (IIT Kanpur)	Fractals, approximation theory and wavelets
Prof. Arindama Singh, Ph.D. (IIT Kanpur)	Logic, numerical analysis
Prof. S. Ponnusamy, Ph.D. (IIT Kanpur)	Complex analysis, function spaces, special functions and conformal geometry
Prof. R. Radha, Ph.D. (IMSc Chennai)	Harmonic analysis, wavelets, time-frequency analysis
Prof. R. Rama, Ph.D. (Anna University)	Formal language and automata theory/molecular computing
Prof. Y.V.S.S. Sanyasiraju, Ph.D. (IIT Madras)	Computational fluid dynamics
Prof. Satyajit Roy, Ph.D. (IISc Bangalore)	Convective heat and mass transfer, computational fluid dynamics
Prof. K.C. Sivakumar, Ph.D. (IIT Madras)	Functional analysis, mathematical programming
Prof. Ch. Srinivasa Rao, Ph.D. (IISc Bangalore)	Non-linear differential equations
Dr S.R. Manam, Ph.D. (IISc Bangalore)	Applied mathematics
Prof. S. Sundar, Ph.D. (IIT Madras)	Computational fluid dynamics, numerical analysis for partial differential equations, mathematical modeling
Prof. M. Thamban Nair, Ph.D. (IIT Bombay)	Applicable functional analysis: spectral approximation, operator equations, inverse and ill-posed problems
Prof. P. Veeramani, Ph.D. (IIT Bombay)	Fixed point theorems and their applications to problems in optimization and best approximation, fuzzy set theory
Prof. V. Vetrivel, Ph.D. (IIT Madras)	Non-smooth optimization, fixed point theory, complementarity problems
Dr A.V. Jayanthan, Ph.D. (IIT Bombay)	Commutative algebra and algebraic combinatorics
Dr A.J. Shaiju, Ph.D. (IISc, Bangalore)	Game theory, systems and control theory
<b>Associate Professors</b>	
Dr Kalpana Mahalingam, Ph.D. (University of South Florida, Tampa)	Theory of codes, DNA computing, combinatorics of words
Dr Kunal Krishna Mukherjee, Ph.D. (Texas, A&M)	Operator algebras
Dr Neelesh S. Upadhye, Ph.D. (IIT Bombay)	Probability theory and applications
Dr Shruti Dubey, Ph.D. (IIT Kanpur)	Nonlinear analysis of functional differential equations, mathematical study of ferromagnetic systems
Dr Sounaka Mishra, Ph.D. (ISI, Kolkata)	Discrete mathematics, approximation algorithm, combinatorial optimization
Dr R. Balaji, Ph.D. (IIT Madras)	Linear algebra and optimization
Dr V. Uma, Ph.D. (IMSC Chennai)	Topology and geometry of toric varieties and related spaces
<b>Assistant Professors</b>	
Dr P. Aprameyan, Ph.D.	Analysis on symmetric spaces, representations of real Lie groups, geometric quantization
Dr T.V. Anoop, Ph.D. (IMSc Chennai)	Linear and nonlinear partial differential equations, nonlinear functional analysis

Dr Arijit Dey, Ph.D.	Algebraic geometry
Dr Dipramit Majumdar, Ph.D. (Brandeis University)	Algebraic number theory, p-adic aspects of modular forms and Galois representations
Dr N. Narayanan, Ph.D. (IMSC, Chennai)	Graph Theory: graph colouring, structural and extremal graph theory probabilistic combinatorics, discrete mathematics
Dr Priyanka Shukla, Ph.D. (JNCASR, Bangalore)	Fluid Mechanics: hydrodynamic instability; nonlinear dynamics; numerical PDE; granular flows; pattern formation
Dr Ramesh Kasilingam, Ph.D. (IIT Bombay)	Differential and algebraic topology and their interactions with differential geometry
Dr Santanu Sarkar, Ph.D. (ISI, Kolkata)	Cryptology and computational number theory
Dr Sarang S. Sane, Ph.D. (TIFR, Bombay)	Commutative algebra, homological algebra, algebraic K-theory, algebraic geometry
Dr Sivaraman Ambikasaran, Ph.D. (Stanford University)	Numerical linear algebra, fast algorithms, and scientific computing
Dr Soumen Sarkar, Ph.D. (ISI, Kolkata)	Algebraic topology, geometric topology, differential geometry, convex geometry, K-theory, topological complexity, persistent homology, ring of continuous functions
Dr Sriram Balasubramanian, Ph.D. (University of Florida)	Functional analysis
Dr Suhas Jaykumar Pandit, Ph.D. (ISI, Bangalore)	Geometric group theory and low-dimensional topology
Dr Sumesh K., Ph.D (ISI, Bangalore)	Operator algebra
Dr T.E. Venkata Balaji, Ph.D. (CMI, Chennai)	Algebraic geometry and commutative algebra
<b>Emeritus Faculty</b>	
Prof. R. Usha, Ph.D. (IIT Madras)	Fluid dynamics

### Special lectures delivered/academic participation by faculty in other institutions

S. No.	Faculty Member	Topic of Lecture/ Academic Participation	Institution	Date
1.	S. R. Manam	Linear water wave interactions with flexible structures	GITAM University, Hyderabad	11 December 2020
2.	S. R. Manam	Analytical study on wave interaction with a flexible porous plate	IIT Guwahati	13 October 2020
3.	Arindama Singh	Goedel's Incompleteness Theorems	IIT Tirupati	12 March 2020
4.	Arindama Singh	Linear Algebra (eight hours' series of lectures)	Gudlavalleru Engineering College	31 October-1 November 2020
5.	Arindama Singh	Modification of Arnoldi Iteration	International Conference, SCMSPS-2020, SSN College	25 November 2020

6.	Arindama Singh	Turing machines	SASTRA University	2 December 2020
7.	Arindama Singh	Proving a program shortest	International Conference, ICAMCI-2020, NIT Agartala	24 December 2020
8.	Arindama Singh	Existence of eigenvalues	Ramanujan Institute	4 March 2020
9.	Venkata Balaji TE	What is Geometry? Lecture as Chief Guest for Ramanujan Day Celebrations	KV, IIT Madras	22 December 2020
10.	Vetrivel V	On convex optimization	BIT, Mesra Ranchi	12 February 2021
11.	Vetrivel V	8th Expert Committee Meeting for the Projects Evaluation under ECRA	DST-SERB	26-28 August 2020
12.	Vetrivel V	2nd Expert Committee Meeting for the Project Evaluation under MATRICS scheme	DST-SERB	6-9 October 2020
13.	Vetrivel V	9th Expert Committee Meeting for the selection of NPDF	DST-SERB	4-6 November 2020
14.	Vetrivel V	10th Expert Committee Meeting for the Projects Evaluation under ECRA	DST-SERB	1-5 February 2021
15.	Vetrivel V	8th Expert Committee Meeting for the Projects Evaluation under ECRA	DST-SERB	16-19 March 2020
16.	S Ponnusamy	Invitation to complex analysis	Mathematics Webinar Week, 22-27 June 2020, Pioneer Kumaraswamy College, Nagercoil, Tamil Nadu, India	22 June 2020
17.	S Ponnusamy	An invitation to advanced complex analysis	Summer School in Mathematics, Kalna College, Kalna, West Bengal	12 July 2020
18.	S Ponnusamy	The Bohr Inequality for the Generalized Cesàro Averaging Operators	Congressio-Mathematica VI, Olsztyn, Poland	28 November 2020
19.	S Ponnusamy	The Man Who Knew Infinity	National Mathematics Day 2020, Department of Mathematics, Chandigarh University	22 December 2020
20.	S Ponnusamy	Bohr Inequality	Srinivasa Ramanujan Memorial Lecture Series, Dharwad, 22-24 December 2020	23 December 2020

21.	S Ponnusamy	Schwarz-Pick, Liouville and Picard theorems	Jammu Refresher Course, Jammu, India	16 January 2021
22.	S Ponnusamy	Planar Harmonic Mappings	Ramanujan Institute of Advanced Study in Mathematics (R. Vaidyanathaswamy Endowment Lecture)	19 February 2021
23.	S Ponnusamy	Problems and Conjectures on Planar Harmonic Mappings	1st International Conference on Applied Analysis, Computation and Mathematical Modelling in Engineering, National Institute of Technology, Rourkela, 24-26 February	25 February 2021
24.	S Ponnusamy	Foundations of Complex Analysis	M. Janakiraman Endowment Lecture, St. Joseph College, Trichy, India	26 February 2021
25.	S Ponnusamy	Recent Approaches to Bohr's Inequality	International Conference on Mathematics and Computing (ICMC2021), Department of Information Technology, Indian Institute of Engineering Science and Technology, Shibpur, India (online)	2 March 2021
26.	Dr Satyajit Roy	Applications of natural/mixed convection flows within cavities	NIT Rourkela	25 February 2021
27.	Dr Satyajit Roy	Role of mathematical modeling in industrial waste management system using mixed convection phenomena	Rajiv Gandhi University (a Central University), Arunachal Pradesh	1 September 2020
28.	Dr Satyajit Roy	Mass transfer in boundary layer flows	NIT Andhra Pradesh	4 November 2020
29.	Shruti Dubey	Fractional differential equations	NIT Andhra Pradesh	6 November 2020
30.	Shruti Dubey	Study of Navier-Stokes Equation with time fractional derivative	SRM Institute of Science and Technology, Tamil Nadu	5 March 2021
31.	Ramesh Kasilingam	Smooth structure on the complex projective spaces	Symposium on Topology and Geometry in the annual meeting of the Indian Mathematical Association, 17-20 December 2020, VIT Vellore, Tamil Nadu	18 December 2020
32.	Ramesh Kasilingam	Fundamental problems in mathematics	Ramanujan Institute for Advanced Study in Mathematics, University of Madras, Chennai, Tamil Nadu	4 February 2021

33.	Ramesh Kasilingam	Division algebras and topology	6th Biennial International Group Theory Conference 2021 (6BIGTC 2021), Vellore Institute of Technology, Vellore, Tamil Nadu	6 March 2021
34.	Sumesh K	Spectral theorem for complex normal operators	Mar Thoma College, Tiruvalla, Kerala	30 September 2020
35.	Sumesh K	Separability and entanglement	University of Kerala	11 February 2021
36.	YVSS Sanyasiraju	Higher order compact scheme for incompressible flow problems	Department of Mathematics, School of Applied Sciences, Reva University Bangalore	13 January 2021
37.	YVSS Sanyasiraju	Meshless numerical schemes	Faculty Development Programme on Mathematics and Its Applications in Science and Technology, Department of Mathematics, Faculty of Engineering and Technology, SRM Institute of Science and Technology	11 July 2020
38.	YVSS Sanyasiraju	Higher order finite difference schemes for viscous incompressible flow problems	National Webinar on Fluid Dynamics from Mathematicians' Point of View (FDFMVP-2020), Department of Mathematics, GITAM Deemed to be University, Hyderabad	12 August 2020
39.	YVSS Sanyasiraju	Finite difference and finite volume methods for fluid flow problems	AICTE-sponsored STTP on Innovative Techniques for Sustainable Energy Development Through Modeling of Mechanical Processes (SERIES-II), Department of Mechanical Engineering, K.L.N. College of Engineering, Madurai	14 September 2020
40.	YVSS Sanyasiraju	Capturing moving interfaces in a RBF-based grid-free environment	Symposium on Iterative methods and PDE which is a part of the international conference, Synergies in Computational, Mathematical, Statistical and Physical Sciences, been conducted by Stella Maris and SSN Colleges, Chennai	25 November 2020
41.	YVSS Sanyasiraju	Shape parameter optimization of the RBF functions for solving the PDE	35th Annual Conference of Ramanujan Mathematical Society been conducted by Department of Mathematics, Central University of Rajasthan	30 December 2020
42.	YVSS Sanyasiraju	Expert member, Faculty recruitment	Department of Mathematics, Rajiv Gandhi University of Knowledge Technologies-AP (RK Valley, Nuzvid, Ongole, Srikakulam campuses)	7-9 March 2021
43.	YVSS Sanyasiraju	Expert Member, Faculty recruitment	Department of Mathematics, VIT Vellore	6 March 2021
44.	YVSS Sanyasiraju	Expert Member (online), Faculty recruitment	GITAM Campuses	8 June 2020

45.	YVSS Sanyasiraju	Expert Member in Selection Committee (online meeting) to consider the promotion from Associate Professor to Professor	Defense Institute of Advanced Technology, Girinagar, Pune	27 July 2020
46.	YVSS Sanyasiraju	Board of Studies' meeting (online) as an University Nominee and External Expert Member	Department of Mathematics, Audisankara College of Engineering and Technology	4 September 2020
47.	YVSS Sanyasiraju	Board of Studies' meeting (online) as Subject Expert Member	Department of Mathematics, JNTU Ananthapur	24 November 2020
48.	YVSS Sanyasiraju	Combined Board of Studies meeting (online) as Subject Expert Member	Department of Mathematics, Rajiv Gandhi University of Knowledge Technologies-AP (RK Valley, Nuzvid, Ongole, Srikakulam campuses)	31 December 2020
49.	YVSS Sanyasiraju	Board of Studies meeting (online) as Subject Expert Member	Department of Mathematics, Sri Venkateswara College of Engineering and Technology, Chithoor	11 January 2021
50.	Soumen Sarkar	Blow-ups and blow-downs of toric orbifolds	The Fields Institute	24 January 2020
51.	Soumen Sarkar	On LS-category and topological complexity of some fiber bundles and Dold manifolds	HSE, Moscow	22 November 2020
52.	Soumen Sarkar	Torsion in the cohomology of blowups and blowdowns of quasitoric orbifolds	Vietnam National University	17 December 2020
53.	A. K. B. Chand	Cyclic iterated function systems, 2nd International Conference on Mathematics Techniques and Applications (e-ICMTA-2021)	SRM Institute of Science and Technology, Chennai	24-26 March 2021
54.	A. K. B. Chand	Nonlinearity and fractals	National Workshop on Data Science and Advanced Computing (online), VIT-AP University, Vijayawada	19-21 March 2021



55.	A. K. B. Chand	Iterated function systems and fractals	National Webinar on Recent Trends in Mathematics, Shailabala Women's Autonomous College, Cuttack	5 January 2021
56.	A. K. B. Chand	Deep learning and self-similarity	AICTE-ISTE Induction Program on Deep Learning, Birla Institute of Technology Mesra, Ranchi	14-19 December 2020
57.	Sundar S	Pedestrian crowd dynamics modeling, in symposium, Mathematics in Industry: Modeling, Optimization and Simulation, IMS Annual Conference 2020 (online)	VIT University, Vellore	17-20 December 2020
58.	Sundar S	Talk: Particles in Fluids: Modeling and Methods, 28th International Conference (virtual) of Forum of Interdisciplinary Mathematics	Forum of Interdisciplinary Mathematics	27-30 November 2020
59.	Sundar S	Talk: Pedestrian crowd dynamics modeling using social and behavioral forces, International Winter School on Fluid Dynamics	NIT Uttarakhand	18-21 January 2021
60.	Sundar S	Talk: Fluid structure interaction using a meshfree method, International Conference	Research Frontiers in Science (online mode)	5-6 February 2021
61.	Sundar S	Faculty Selection Committee Expert	IIT Delhi	6 February 2021
62.	Sundar S	Faculty Selection Committee Expert	IIT BHU	11 February 2020
63.	Sundar S	Faculty Selection Committee Expert	BITS	16 May 2020
64.	Sundar S	Faculty Selection Committee Expert	IIITDM Kurnool	22 December 2020
65.	Sundar S	Faculty Selection Committee Expert	IIT Bhilai	23-24 December 2020
66.	Sundar S	Projects Selection Committee Expert	DST-SERB, POWER, New Delhi	9 February 2021
67.	Sundar S	DST-SERB	PAC on Mathematical Sciences	10 December 2020
68.	Sundar S	DST-SERB	PAC on Mathematical Sciences	10 December 2020

**Visits abroad by faculty**

S. No.	Faculty Member	Country Visited	Date	Purpose of Visit	Funding from
1.	Jayanthan A. V.	Canada	20-28 January 2020	Conference	CPDA
2.	Santanu Sarkar	Germany	5 December 2020-To date	Research	Humboldt

**Honours obtained by faculty**

S. No.	Faculty Member	Award	Awarded by	Date of Award
1.	Shruti Dubey	Elected member of NASI	NASI	2019 onward

**Fellowships of academies and professional societies**

S. No.	Faculty Member	Year of Admission
1.	Dr Santanu Sarkar	Humboldt Fellowship 2020-2022 (15 months)

**Journal Editorial Boards**

S. No.	Faculty Member	Position	Journal Name
1.	S Ponnusamy	Editorial Member	<i>Journal of Inequalities and Applications</i> (Springer)
2.	Shruti Dubey	Guest Editor	<i>Differential Equations and Dynamical Systems</i> 29, 1(2021)
3.	YVSS Sanyasiraju	Editor	<i>The Mathematics Consortium Bulletin</i>

**Sponsored research projects (ongoing and new)**

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1.	Mathematical study of anomalous diffusion processes via partial differential equations	2020-2023	SERB (Science and Engineering Research Board)	6.6	Dr Shruti Dubey
2.	CP-Maps, entanglement breaking quantum channels, CP-H-extendable maps and their multiplicative domains	12 January 2021-11 January 2024	SERB (Science and Engineering Research Board)	6.6	Sumesh K
3.	CFD of thin film flow on substrates featuring topography; Coordinator: YVSS Sanyasiraju	October 2018-October 2021	SERB, DST, India	19.98	Prof. R. Usha
4.	Arithmetical aspects of the Fourier coefficients of modular forms	2019-2021	SPARC	40	Sanoli Gun, Dipramit Majumdar, Yuri Bilu, Jean Marc Deshouillers
5.	Relating p-Selmer group of elliptic curves and p-Class group of number fields	2021	IIT Madras ERP	7.5	Dipramit Majumdar

6.	Fields Institute Visit, Dr Soumen Sarkar	1-6 months	Fields Institute	2.2	Prof. Don Stanley and Prof. A. Bahri, Prof. Lisa Jeffrey
7.	Evolutionary stability in asymmetric games with continuous strategy space	28 May 2018-27 May 2021	DST	6.60	Dr A. J. Shaiju
8.	Computational mathematics and data science	March 2021	Centre of Excellence under Institute of Eminence, Government of India	400	PI: Dr Neelesh S. Upadhye; Co-PI: Prof. Sundar S
9.	Quantum Analysis	March 2021	Centre of Excellence under Institute of Eminence, Government of India	80	PI: Dr Kunal Krishna Mukherjee; Co-PI: Dr Sumesh and Dr Aprameyan P
10.	Algebraic Geometry	February 2021	Centre of Excellence under Institute of Eminence, Government of India	75	PI: Dr Arijit Dey

#### Exchange programme with other universities, including institutions/universities under MoU

Vyshakh BR, a five-year BS and MS student of IISER Tirupati, carried out his full one-year project, "Thin film flow over inclined plane featuring topography," successfully under Prof. Y.V.S.S. Sanyasiraju (no other supervisor including at IISER, Tirupati), June 2020.

## 4.13 Department of Mechanical Engineering

### 4.13.1 Introduction

The Department of Mechanical Engineering was established in 1959. The department offers Ph.D., M.S., M.Tech., B.Tech. and Dual Degree programmes, and has excellent facilities to carry out state-of-the-art research in three major disciplines of Mechanical Engineering, namely, Thermal Engineering, Mechanical Design and Manufacturing Engineering. The Thermal Engineering stream comprises five laboratories, namely, Heat Transfer and Thermal Power, Fluid Systems Laboratory, I.C. Engines, Refrigeration

and Air Conditioning, and Thermodynamics and Combustion.

The Mechanical Design stream consists of Machine Design Section, Machine Dynamics Laboratory, NDE Laboratory, Rehabilitation Research and Device Development Laboratory.

The Manufacturing Engineering stream consists of Machine Tools Laboratory, Metrology Laboratory, Automation Laboratory, Sheet Metal Research Centre and Precision Engineering Laboratory.

### 4.13.2. Academic Programmes

#### New courses introduced

S. No.	Course No.	Title
1	ME6355	Topology Optimization
2	ME 5228	Engineering Acoustics
3	ID5130	Parallel Scientific Computing
4	ME5310	Dispersed Multiphase Flows

#### Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	207	189	89	58	14	557
Dual Degree	-	2	81	103	95	281
M.Tech.	93	63	4	-	-	160
M.S.	37	45	47	26	8	163
Ph.D.	37	59	50	43	90	279
Total	374	358	271	230	207	1440

#### Students/Scholars who won Institute Convocation/Institute Day Prize

S. No.	Student/Scholar	Roll No.	Prizes	Donor
1	Dinesh Bompada	ME16B011	Banco Foundation Prize	Banco Foundation
2	Aman Vaibhav	ME15B081	Bhagalakshmi and Krishna Iyengar Award	Bhagalakshmi and Krishna Iyengar
3	Aman Jalan	ME15B167	Prof GVN Rayudu (IIT Madras) Prize	Prof GVN Rayudu (IIT Madras)
4			American Express Top Achievement Award	American Express

5	Sarthak Rastogi	ME18M071	Prof B Sengupto Prize	Prof B Sengupto
6			Prof Ramamohana Rao Memorial Prize	Prof Ramamohana Rao
7	Surya R	ME16B047	Sivasailam Merit Prize	Sivasailam
8	Pushpak Yashawant Nemade	ME18M058	Mico-Bosch Prize	Mico-Bosch
9	Kopparthi Mouli	ME18M044	Dr S Vaidyanathan Memorial Prize	Dr S Vaidyanathan
10	Anirudh B Krishnan	ME18M087		
11	Mahesh MS	ME18M048		
12	Kamthe Aniket Anil	ME15B112		
13	Prithviraj Mukhopadhyay	ME14D090	Prof R Krishnamurthy Endowment Award	Prof R Krishnamurthy
14	Omkar Baswaraj Bembalge	ME14D034		
15	Gunjan Patel	MS 2019		

### 4.13.3. Faculty and their specialisation

#### Faculty

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Dr Seshadri Sekhar A. (Head)	Rotor dynamics, condition monitoring, tribology
Dr Arunn Narasimhan	Heat transfer and fluid flow in biological systems, heat transfer and fluid flow in porous medium, phase change materials, convection heat transfer, fluid mechanics
Dr Babu Viswanathan	CFD, high-speed reacting flows, high-performance computing
Dr Chakravarthy Balaji	Fundamental heat transfer, optimisation of thermal systems, inverse problems in heat transfer, satellite meteorology, numerical weather prediction
Dr Chandramouli P.	Nonlinear dynamics, acoustics and noise control
Dr Dhiman Chatterjee	Fluid mechanics, turbomachines, cavitation
Dr Gnanamoorthy R.	Advanced materials and product design, design with polymer and nanocomposites, machine element and special purpose test machine design, damage tolerant and tribo design, behaviour of implant materials, surface engineering
Dr Krishnan Balasubramaniam	Nondestructive evaluation, materials characterisation, online measurements
Dr Krishna Kannan	Continuum mechanics, thermodynamics, constitutive modelling of polymeric materials
Dr Mani A.	Refrigeration, desalination, solar energy
Dr Maiya M. P.	Sorption technology, metal hydride systems, hybrid air conditioning
Dr Mallikarjuna J. M.	In-cylinder flow studies in engines, HCCI and GDI engines, alternate fuels
Dr Prasad B.V.S.S.S.	Blade cooling, thermal hydraulics, computational fluid dynamics (CFD)
Dr Raghavan V.	Combustion modeling, droplet combustion, laminar flames
Dr Raghu Prakash V.	Fatigue and fracture mechanics, random load life prediction, product design
Dr Raju Sethuraman	Computational solid mechanics, fatigue and fracture of materials

Dr Ramesh Babu N.	Manufacturing engineering—advanced machining processes, automation, process modeling, precision machine tool development
Dr Ramesh A.	I.C. engine combustion and emissions, electronic engine management, alternative fuels
Dr Sarit Kumar Das	Heat exchangers, two-phase flow, nano fluids, jet oscillations, nuclear heat transfer
Dr Samuel G. L.	Machining, metrology and computer-aided inspection, micromachining
Dr Seshadri Sekhar A.	Rotor dynamics, condition monitoring, tribology
Dr Shaligram Tiwari	Thermocapillary convection, heat and mass transfer
Dr Shankar Krishnapillai	Structural vibrations, design optimisation, system identification
Dr Srinivasa Reddy K.	Renewable energies, solar energy, energy conservation, energy environment, heat transfer in two-phase systems
Dr Srinivasan K.	Jet flow and noise, active and passive flow control, measurement and instrumentation
Dr Sujatha C.	Vehicle dynamics, machinery diagnostics, signal analysis
Dr Sundararajan T.	Droplet combustion, supersonic reacting jet flows, CFD
Dr Sujatha Srinivasan	Biomechanics, mechanisms, assistive devices
Dr Shamit Bakshi	CFD in I.C. engines, liquid atomisation and spray systems, fuel nozzle modeling
Dr Venkatrathnam G.	Refrigerant mixtures, new processes that work with refrigerant mixtures, improvement of performance of vapour compression refrigerators
Dr Prabhu Rajagopal	Ultrasonic waves for nondestructive evaluation, health monitoring and process control, computational methods for modelling elastic wave phenomena
<b>Associate Professors</b>	
Dr Anand T.N.C.	CFD simulations of I.C. engines processes, laser-based diagnostics of sprays and combustion
Dr Abhijit Sarkar	Vibration, acoustics, computational methods
Dr Amitava Ghosh	Machining and grinding of advantage materials, development of abrasives
Dr Arvind Pattamatta	Micro/nano scale energy transport, computational heat transfer, mesoscopic modeling, phase change heat transfer, turbulence modeling
Dr Ashis Kumar Sen	Microfluidics, microsystems, thermo-fluids
Dr Balaji Srinivasan	Fluid dynamics, turbulence in compressible and hypersonic flows, computation of rarefied flows, numerical analysis and high-performance computing
Dr Manivannan P.V.	Robotics, automotive control system, autonomous vehicles, instrumentation and controls, mechatronic system design, microprocessor
Dr Narasimhan Swaminathan	Computational materials science and mechanics, radiation damage in materials, multiscale modeling of complex phenomenon in nuclear and fuel cell materials, finite element method, continuum mechanics, multiscale modeling, radiation damage in materials, computational materials science
Dr Parag Ravindran	Viscoelastic fluids constitutive modeling
Dr Ratna Kumar Annabattula	Finite element analysis, granular mechanics, buckle-driven de-lamination, fusion materials, mechanics of micro-systems
Dr Sathyan Subbiah	Novel applications of machining, diamond turning, layered material exfoliation, surface texturing

Dr Somashekhar S. Hiremath	Micromachining, mechatronic system design, oil hydraulics, system simulation and modeling, finite element method (FEM)
Dr Sushanta Kumar Panigrahi	Friction stir processing and welding, superplasticity, advanced metal forming techniques for producing bulk nanostructured/UFG metals and alloys, thermo-mechanical processing of light-weight structural metallic materials
Dr Sundararajan Natarajan	Computational mechanics, moving boundary problems, composite mechanics
Dr Anand K.	Low-temperature combustion engines, surrogate modelling of automotive fuels, engine emission reduction through fuel modifications
Dr Arunachalam N.	Sustainable manufacturing, diagnostics, prognostics and health management of machine tools, smart machine tools
Dr Mayank Mittal	I.C. engines, optical diagnostics, fluid mechanics
Dr Ramkumar Penchaliah	Tribology, engine tribology, coatings, bio-implants, condition monitoring, WTG bearing failures, wear modelling and nanolubrication
<b>Assistant Professors</b>	
Dr Anil Kumar Meena	Casting processes, cast irons and steels manufacturing, microstructure and properties of ADI, dry and near-dry machining process
Dr Hariharan K.	Sheet metal forming, plasticity, fatigue and mechanical behaviour of materials
Dr Kameswararao Anupidi	Fluid mechanics, computational fluid dynamics, bio-fluid dynamics, turbulence modelling
Dr Krithika Narayanaswamy	Thermodynamics, combustion concepts and applications, numerical methods for thermal engineering
Dr Manoj Pandey	Finite element analysis, dynamics and MEMS
Dr Pallab Sinha Mahapatra	Surface engineering and wettability patterning, open surface microfluidics, multiphase flow, single and multiphase heat transfer
Dr Piyush Shakya	Condition monitoring, fault diagnosis, prognosis
Dr Sateesh Gedupudi	Heat exchangers, two-phase flow, nano fluids, jet oscillations, nuclear heat transfer
Dr Shyama Prasad Das	Unsteady hydro and aerodynamics, turbomachines, interfacial hydrodynamics and transport
Dr Sivasrinivasu Devadula	Manufacturing engineering
Dr Soundarapandian S.	Additive manufacturing, computational modeling and simulation
Dr Sourav Ratshit	Laser processing
Dr Srikrishna Sahu	Spray dynamics, two-phase flows, optical diagnostics
Dr Varunkumar S.	Thermo-chemical conversion of biomass and coal for energy and fuels and modeling instability in solid rocket motors
Dr Vishal V. R. Nandigana	Microfluidics and nanofluidics, nano manufacturing, battery synthesis, MEMS, NEMS
Dr Vishwanath K.	Turbomachinery noise
<b>Emeritus Professor</b>	
Dr M.S. Shunmugam (Emeritus Professor)	Metrology, manufacturing—gear, BTA machining, reaming, centreless grinding, EDM, friction welding; manufacturing automation and robotics, process planning, inspection and quality control

### Short-term courses/workshops/seminars/symposia/conferences organised by faculty members

S. No.	Coordinator(s)	Title	Period
<b>Conferences</b>			
1	Dr Raghu V. Prakash	ASME IMECE 2020 - Topics 3-21 (Fracture and Damage: Nano- to Macro-Scale), 3-22 (Materials Processing and Characterization), 3-24 (Recent Developments in Tribology)	16-20 November 2020, online
2	Dr Sushanta Kumar Panigrahi	6th Asian Conference and Expo on Heat Treatment and Surface Engineering	5-7 March 2020, Chennai, India
<b>Workshop</b>			
1	Dr Shankar Krishnapillai and Dr R Velmurugan (Aerospace Engineering Department)	Multi-Functional Materials for Extreme Loading (MF MEL 2021)	22-24 February 2021
<b>Short-term Courses</b>			
1	Dr Piyush Shakya	Elements of Smart Manufacturing	15-21 February 2021
2	Dr G.L. Samuel	Smart Manufacturing and Metrology	22-27 February 2021

### Short-term courses/workshops/seminars/symposia/conferences/training attended by faculty members in academic institutions and public sector undertakings

S. No.	Faculty Member	Title	Institution	Period
<b>Workshops</b>				
1.	Dr A Mani	Bubble absorber: current status and future trends	National Workshop on Renewable Energy, Gwalior, India	January 2021 (online)
2.	Dr GL Samuel	Webinar - Guru Talks	Ultra Short Pulse Laser Micro Machining, India	August 2020 (online)
3.		Novel material synthesis using pulsed laser ablation process	Japan-India Inter-University Exchange Project Online Student Workshop on Technologies for the Future	September 2020, Hiroshima University, Japan
4.	Dr Sujatha Chandramohan	Fundamentals of Acoustics	Dr V Ramamurti Memorial Lecture Meeting organised by SAE, Chennai, India	30 January 2021
5.		Series of lectures in Vibration and Signal Processing	SAEISS Online Lecture Series on Vibration and Signal Processing	14-26 December 2020, Chennai, India, conducted virtually



6.		Series of lectures on Recent Developments in Vibration and Acoustics	Online FDP on Recent Developments in Vibration and Acoustics	10-14 August 2020, Vishwakarma Institute of Information Technology, Pune and SAE India, Pune, India
7.	Dr Amitava Ghosh	Emerging trends in cooling-lubrication technology for high-speed machining	Teaching and Learning of Advances in Manufacturing Technologies (as a keynote speaker) (online)	30 November-4 December 2020, Department of Mechanical Engineering in association with a teaching-learning centre, NIT-Warangal
8.	Dr Ramkumar P	Effect of additives on a DLC-coated surface textured piston ring-cylinder liner system	Indo-Korean workshop: Multi-Functional Materials for Extreme Loading, MFMEI 2021	22-24 February 2021, IIT Madras

**Symposia**

1.	Dr V Raghavan	Experimental and numerical studies on downward flame spread over PMMA with and without the addition of triphenyl phosphate	38th International Symposium on Combustion	24-29 January 2021, Adelaide, Australia
2.	Dr Srikrishna Sahu	Optical characterization of droplet clusters and group combustion in spray diffusion flames		
3.	Dr Ramkumar P	Effect of micro-geometrical parameters of crosshatch texture over the tribo-performance of hip implant tribo-pair	International Tribology Research Symposium	5-7 November 2020, SRM University, Chennai, India

**Conferences**

S. No.	Faculty Member	Conference	Topic	Period
1.	Dr Sourav Rakshit	ASME IMECE 2020	Topology optimization of the hip bone for walking using multi-load approach	13-19 November 2020, Portland, USA
2.		ASME IDETC-CIE 2020	Topology optimization of the pelvic bone prosthesis under single leg stance	16-19 August 2020, St Louis, USA
3.	Dr K Hariharan	Recent Advances in Manufacturing (RAM-2020)	Stress relaxation study of ultrafine-grained AA 6061 alloy processed through combined constrained groove pressing and cold rolling	3-5 July 2020, S. V. National Institute of Technology Surat, India

4.	Dr A Mani	18th International Conference on Refrigeration and Air Conditioning at Purdue-2020, USA	Measurement of film thickness and temperature on horizontal metal spray coated tube falling film evaporator using interferometric technique	13-16 July 2020, Purdue University, USA
5.			Bubble dynamics studies in an absorber with swirl entry of an absorption refrigeration system	
6.	Dr GL Samuel	CIRP - Conference on Intelligent Computation In Manufacturing Engineering	Support vector machine regression for predicting dimensional features of die-sinking electrical discharge machined components	15-17 July 2020, Gulf of Naples, Italy
7.	Dr Sujatha Chandramohan	International Conference on Engineering Science and Technology	Effect of sound and vibration on human beings-Case studies	3-4 February 2021. Luxor, Egypt; attended virtually
8.	Dr Amitava Ghosh	International Conference on Advancements and Futuristic Trends in Mechanical and Materials Engineering	Novel composite active fillers for brazing diamond abrasives to steel substrate	19-20 December 2020, IIT Ropar (mode: online), India
9.	Dr Raghu V Prakash	ASME IMECE 2020	1) Finite element study of the effect of load sequence on the fretting wear 2) Evaluation of fatigue crack growth characteristics on stainless steel SS 316 LN using acoustic emission technique 3) Energy absorption characteristics of axially compressed double wall foam filled and empty square tubes 4) Combined effect of loading and interference level on stress intensity factor for a pin loaded joint 5) An investigation on flexural fatigue behavior of CFRP quasi-isotropic laminates	17-20 November 2020, virtual conference
10.		ASME PVP-2020 conference	Acoustic emission monitoring during fatigue crack growth in standard C (T) and miniature single edge notch tension specimens	3 August 2020, virtual conference
11.		1st Virtual European Conference on Fracture	1) Analysis of crack-tip constraint due to V-and U-side grooves in C (T) specimens 2) Online acoustic emission monitoring of cyclic ball indentation testing-correlation with hysteresis area response 3) Combined influence of pin-hole interference and additional hole on the stress intensity factor for a pin loaded finite plate	29 June-1 July 2020, virtual conference

12.	Dr Ramkumar P	TRIBOINDIA 2020	Tribological investigation of white etching area (WEA) formation under severe sliding condition in bearing steel	10-12 December 2020, SRM University, Chennai, India
13.		International Conference on Engineering Tribology and Applied Technology (ICETAT 2020), first India-Taiwan-Russia symposium	Impact of lubricant stability on premature bearings failure under transient operating conditions in gearbox	6-8 November 2020, online (Taiwan)
14.	Dr Sushanta Kumar Panigrahi	6th Asian Conference and Expo on Heat Treatment and Surface Engineering	Establishment of a novel cold-welding technique to develop aluminum-copper bimetals using a combination of severe plastic deformation and heat treatment	5-7 March 2020, Chennai, India
15.			Engineering initial microstructure by pre-heat treatment for enhanced rollability of Zk60 (Mg-Zn-Zr based) magnesium alloy	

#### Short-term courses

1.	Dr GL Samuel	IITM, India	Enduring trends in hydraulic control systems: past, present and future	22-27 March 2021
2.			Elements of smart manufacturing (ESM)	15-20 February 2021
3.	Dr Amitava Ghosh	NIT Warangal, India	As keynote speaker: Teaching and learning of advances in manufacturing technologies	30 November-4 December 2020

#### Special lectures delivered by the faculty in other institutions

S. No.	Faculty	Topic of Lecture	Institution	Date
1	Dr K. Srinivasan	Basics of Noise in HVAC Systems	Vimal Jyothi Engineering College, Jyothi Nagar, Chemperi, Kannur, Kerala, India - 670632	31 August 2020
2	Dr Raghu V Prakash	Structural Integrity, Damage, Failure	VAIBHAV, organised by Government of India, as Panelist	15 October 2020
3		Failure Analysis and Fracture Mechanics	VIT, Vellore (online)	6 November 2020
4		Infrared Thermography and Computed Tomography Applications in Composites	Pillai Institute of Technology, Navi Mumbai	21 November 2020
5	Dr Sushanta Kumar Panigrahi	Magnesium-Based Alloys and Their Composites: Fundamentals to Research at Innovative Materials Processing and Characterization Research Group, IIT Madras	IIT Bombay, Mumbai, India	18 May 2020

6	Potential of Engineered Magnesium-Based Alloys and Composites for Automotive and Aerospace Industries: Research to Application	Indian Institute of Metals (IIM)	25 July 2020
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### Visits abroad by faculty

S. No.	Faculty Member	Country Visited	Date	Purpose of Visit	Funding from
1	Dr K. Anand	United Kingdom	23 January 2020	For UKIERI Project Discussion	Department of Science and Technology, Government of India

### Honours and awards obtained by faculty

S. No.	Faculty Member	Award	Awarded by	Awarded for	Date of Award
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#### i. Honour

1	Dr Krishna Kannan	Member of editorial board, Applications in Engineering Science	Elsevier		
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#### ii. Awards

1	Dr GL Samuel	Appreciation certificate - Unsung Heroes During Lockdown	Dean ICSR	Exemplary contribution to ultrafast short pulsed laser and micro EDM	29 March 2021
2	Recognition of journal article	Alumni Tech Talks		Article on "The way to perfection - Ultrafast pulse laser inscription and surface quality characterization of micro-structured silicon wafer"	25 February 2021
3	Dr Amitava Ghosh	Received by Ph.D. scholar (P Mukhopadhyay): R Krishnamurthy Endowment Award	IIT Madras	Best Ph.D. thesis in the area of "Surface Engineering, Tribiology, Advanced Materials - Composites, coatings and treatments.	25 October 2020
4	Dr. Amitava Ghosh	Received by MS scholar (Sweety Sathpathy): Best Presentation Award	Competent Authority of ICMEM2020	Best session presentation	11 April 2020

5	Dr Sujatha Srinivasan	IIT Madras was selected as The Most Innovative Institute of the Year for disruptive innovations, as part of the CII Industrial Innovation Awards 2020. The Arise Standing Wheelchair was one of the innovations featured in the award nomination.			9 December 2020
6	Dr Sujatha Srinivasan	Gunjan Patel (MS 2019) guided by Prof. Sujatha Srinivasan and Dr Rajdeep Ojha (CMC Vellore) is a recipient of the SRISTI-GYTI 2020 Award for AbleFit: Wearable device for orthopedic and neurological disorder patients, based on his MS work			1 September 2020
7	Dr Sushanta Kumar Panigrahi	Best Paper Award (First)	International Federation of Heat Treatment & Surface Engineering and ASM International	For paper, Establishment of a novel cold-welding technique to develop aluminum-copper bimetal using a combination of severe plastic deformation and heat treatment, Sixth Asian Conference and Expo on Heat Treatment and Surface Engineering	7 March 2020
8	Dr Sushanta Kumar Panigrahi	Sri R Krishnamurthy Endowment Award and Institute Research Award	IIT Madras	Excellence in PhD research by Omkar Bembalge (PhD scholar of Dr S.K. Panigrahi)	25 October 2020
9	Dr Kameswararao Anupindi	Smt. Marti Annapurna Gurunath Award for Excellence in Teaching	IIT Madras	Teaching	10 September 2020
10		Unlock Ideas proposal	Lam Research Corporation, USA (2020)	Project proposal	10 October 2020
11	Dr A Seshadri Sekhar	Recognised: Listed among the World's Top 2% Scientists prepared by Stanford University (2020)	Stanford University (2020)	Recognised: Listed among the World's Top 2% Scientists	3 November 2020

#### 4.13.4. Design and Development Activities

Brief and specific details of process/instruments/equipment/software designed and developed

S. No.	Faculty Member	Details
1	Dr Piyush Shakya	Automation of Grinding Intelligence (Copyright filed on 24 February 2021)
2	Dr Vishal Nandigana	Founder, Parent Industry √ (Intelligence All Done Technology)

3	Dr A. Ramesh	Developed a new combustion chamber with a profiled piston for stratified charging of a small spark ignition engine for improved efficiency Developed a twin injector based concept for efficient operation of a gas-based PCCI/dual fuel engine Developed a novel method of glow plug temperature control for methanol-based engines. Developed a prechamber ignition system for lean operation with high efficiency for a small SI engine
4	Dr Krishna Kannan	Constitutive models for filled rubbers (for MRF Limited)
5	Dr GL Samuel	1. Synthesis of nanoparticles at solid-solid interface using ultrafast laser process 2. Development of algorithms to evaluate free form surfaces 3. Laser inscription and characterization of micro-structures on silicon surfaces 4. Fabrication of micro-dies to produce microchannels for separation of blood particles 5. Fabrication and characterization of helical grooved cylindrical electrodes generated by WED turning process 6. Development of neural networks to characterize micro turning process 7. Laser functionalism of superhydrophobic and superhydrophilic surfaces
5	Dr Amitava Ghosh	Ultra high-speed test rig for miniature grinding wheel, a simple micro-particle transfer device
7	Dr K. Anand	Combustion mode and fuel flexible low-temperature combustion engine, low-power input fuel vaporizer for HCCI engine applications, variable valve timing system for HCCI engine application, dynamic on-board fuel blending system, cartridge-based heated fuel injector
8	Dr Ramkumar P	Liner reciprocating tribometer (Rtec, USA)
9	Dr Sushanta Kumar Panigrahi	Microforming-image correlation unit

### New facilities added or major equipment procured

S. No.	Equipment	Value (Rs. in lakh)
1	Force plates	20
2	Horiba Mexa Euro VI Emission Analyser	70
3	FTIR Euro VI compatible	104
4	Semi automatic segmentation software	26.5
5	Beam expander for laser micro machining	1.31
6	33522B Waveform generator, 30 MHz, 2-channel, keysight and miniature accelerometers	3.76
7	Modal 50A Exciter+MB500VI Solid State Power Amplifier	9.7
8	Ultra high-speed test rig for miniature grinding tools	24
9	Pattrened grit-placement set up (under development)	8
10	Acoustic impedance/transmission loss measurement system	15
11	Electrodynamic Exciter 1-ton capacity	25
12	Liner reciprocating tribometer	65
13	Fatigue testing equipment for prosthetic knees (customised equipment)	9
14	Micro hardness testing unit	4
15	Digital microscopy	13

**Patents filed**

S. No.	Faculty Member	Topic of Patent
1	Dr A. Ramesh	A system and method for controlling combustion in a direct injection engine
2	Dr G.L. Samuel	Layered non-rectangular shape micro channels in single crystal silicon heat sink using ultra-short pulse laser
3	Dr Amitava Ghosh	System and method for developing uni-layer brazed grinding wheels by placing grit in a pre-defined array
4	Dr K. Anand	Cartridge-based heated fuel injector
5		Electronic variable valve actuation (EVA) system for advanced combustion engines

**Patents awarded**

S. No.	Faculty Member	Topic of Patent	Patent Number	Country of Patent
1	Dr K. Srinivasan	An integrated annular tube for use as solar concentrator, conveyor and storage system	335377	India
2	Dr Chandramouli P	An optimized and modular horizontal axis hydrokinetic energy system for low flow speeds	IN201841029023A	India
3	Dr Sujatha Srinivasan	Method and apparatus for measuring spatiotemporal parameters for gait and movement analysis (with Gunjan Patel and Dr Rajdeep Ojha (CMC Vellore))	201841006227	India
4		Safe clip-on attachment to convert wheelchair into an outdoor vehicle (with Swostik Sourav Dash and Vivek Sarda)	201841027569	India
5		A multi-position wheelchair (with Harshal Chaudhari)	4806/CHE/2012	
6		Body movement based training and mobility device (with Vivek Sarda, Anil Prabhakar (EE), Namita Jacob (Chetana Charitable Trust), T A Simy (Vidya Sagar)	5352/CHE/2013	India
7		Easy-to-use portable manual standing wheelchair with safety features and for outdoor use (with Vivek Sarda and Swostik Sourav Dash)	16/337,756	US
8		Swimming pool lift for physically challenged (with Swostik Sourav Dash)	3045/CHE/2013	India
9		A prosthetic knee for uneven terrain (with TS Anand)	6025/CHE/2014	India
10	Dr C Balaji	Foot-operated tap assembly	332517-001	India
11		Rotatable heat sink	351972	India

**4.13.5. Research and Consultancy****Sponsored research projects (ongoing and new)**

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1	R2D2 Centre Project	July 2020- July 2025	IIT Madras	115	Sujatha Srinivasan
2	Abdul Kalam Technology Innovation National Fellowship	February 2020-January 2023	INAE	57	Sujatha Srinivasan
3	Development of algorithm of prognostic tool for maintenance of helicopter gears	1 June 2020- 1 December 2022	Hindustan Aeronautics Limited	48 (approx.)	PI: Dr Piyush Sakhya, Co-PI: Prof. A. Seshadri Sekhar
4	In-situ condition monitoring of O-ring	1 September 2020-31 August 2021	Lam Research	18 (approx.)	PI: Prof. A. Seshadri Sekhar, Co-PI: Dr Piyush Sakhya, Dr Balaganesan (Central Workshop)
5	Experimental and numerical studies of accidental multiple pool fires occurring in chemical process industries	8 January 2021-7 January 2023	SERB, DST	22.368	PI: Dr V. Raghavan
6	Numerical simulation of tunnel furnace to predict the heat transfer and temperature distribution on the slabs	3 March 2020-2 March 2022	TATA Steels	8.75	
7	Electroplastic deformation for enhanced formability	2020-2023	Science and Engineering Research Board (SERB), DST India	55.81	K. Hariharan, Sushanta K. Panigrahi and Murugaiyan Amirthalingam
8	Development of a small direct injection spark-ignition (DISI) engine for conventional and hybrid applications running on gasoline and alternative fuels	November 2018- November 2021	UAY/Ministry of Education	182.12	Dr A. Ramesh, Dr Mayank Mittal
9	Development of an electronically controlled high performance hot surface ignition engine running on methanol for automotive applications	March 2020-March 2023	DST	258.94	Dr Ramesh, Dr J M Mallikarjuna
10	Development and validation of a cost-effective hybrid electric drive solution for small two wheelers for reducing CO <sub>2</sub> emission (HERCET)	June 2019- June 2022	Indo-German Science and Technology Centre	101.16	Dr A Ramesh, Collaborator: Dr Mayank Mittal



11	Thermo-fluid dynamic measurement of evaporating film on a heated surface	6 March 2020-5 March 2023	Science and Engineering Research Board	60.6	Dr Shamit Bakshi
12	Gas-atomization system for producing steel powders	8 March 2019-7 March 2022	SERB (IMPRINT-2)	118.2	Dr Shamit Bakshi, Dr Anand T N C
13	Gas-atomization system for producing steel powders	8 March 2019-7 March 2022	Sandvik Materials Technology (Industrial partner for IMPRINT-2)	38	Dr Shamit Bakshi Dr Anand T N C
14	Compact solar desalination and cold storage systems	2021-2023	MoE	415	Dr A Mani Dr Shaligram Tiwari and Prof. Ganesan,A.R.
15	Specialised manufacturing techniques for the development of high-power motor of indigenous AC fuel transfer pump	2019-2020	ADA	18.21	Dr GL Samuel
16	Centre of Excellence for Advanced Laser Manufacturing	2020-2022	Institute of Eminence	354.8	Dr GL Samuel, Prof. N Ramesh Babu, Prof. Nilesh Vasa, Prof. G Phani Kumar, Dr Amitava Ghosh
17	Seismic test on our 245 kV CB type LTB 245E1	31 December 2020-30 June 2021	ABB Power Products and Systems India Limited	3.5	Dr C Sujatha, Dr Parag Ravindran
18	Seismic test on 132 outdoor, oil cooled current transformer	28 October-31 December 2020	Pragati Electricals Private Limited	4.68	Dr C Sujatha, Prof. Krishnakannan
19	Seismic test on zinc oxide arrester	18 March-31 July 2020	CG Power and Industrial Solutions Limited	3	Dr C Sujatha
20	Analyses of grinding performance and ground surface integrity in high MRR precision grinding by indigenously developed brazed diamond wheels having patterned grit distribution	2019-2022	SERB	50.1	Dr Amitava Ghosh
21	Fundamental studies on water-in-diesel emulsions as alternative fuels	11 February 2020-10 February 2023	SERB	67.13	Dr K Anand

22	Recreation of white etching areas (WEAs)	1 March 2021-28 February 2023	GE (India) Private Limited, Bangalore	2.18	Dr Ramkumar P
23	Evaluation of lubricants performance using dynamic load modified pin-on-disc at high frequency against white etching areas formation on different materials - phase I and II	September 2019-August 2021	Kluber Lubrication, Germany	13.5	Dr Ramkumar P
24	Evaluate the brake torque fade behaviour in elevator brake system	September 2019-August 2021	KONE Elevator Private Limited	4.6	Dr Ramkumar P
25	Support for Sustaining Research (SSR)	3 August 2020-30 April 2021	IIT Madras	10	Dr Sushanta Kumar Panigrahi
26	Development of advanced water washing system for compressor blade cleaning for gas turbine efficiency improvement	2020-2023	SERB IMPRINT	102	Dr Srikrishna Sahu, Satyanarayanan Seshadri, AM

### Faculty members' participation with other institutions under MoU

S. No.	Faculty Member	Participation Details	University/Institution
1	Dr Krishna Kannan	Joint research with Prof. S. Baek, MSU	Michigan State University
2	Dr GL Samuel	Joint Doctoral Programme	University of Technology, Sydney, Australia
3	Dr Raghu V Prakash	Initiated MoU between IIT Madras and University of Maryland/CALCE, USA	University of Maryland, USA
4	Dr K. Anand	INNO-INDIGO Project Meeting with PTB Germany	PTB, Germany
5	Dr K. Anand	Joint INNO INDIGO project meeting with collaborators from PTB, Germany, University of Helsinki, Finland, University deCatholique, Belgium, Goa University, Goa	
6	Dr Sujatha Srinivasan	MoU initiated by Global Disability Innovation Hub based on interactions between Prof. Sujatha Srinivasan and Prof. Cathy Holloway	University College of London
7		MoUs for Assistive device testing	Livewell Institute of Rehabilitation Medicine, Madurai; MIOT Hospital, Chennai

**4.13.6. Other Activities of the Department****Faculty visit**

S. No	Faculty Member	Purpose of Visit	Date and Venue
1	Dr Krishna Kannan	Board of Studies, IITDM	IITDM, Chennai
2	Dr Shamit Bakshi	Droplet Evaporation and Condensation	24 January 2020, IISc, Mechanical Engineering AR Auditorium, India
3	Dr Sujatha Chandramohan	The 18th Expert Committee meeting (NPDP proposals under Engineering Science) meeting	6 November 2020, New Delhi, India, Virtual meeting
4		16th Expert Committee meeting of second Start-up Research Grant call (February 2020) - Engineering Science in the sub-area of Mechanical Engineering	18 August 2020, New Delhi, India, Virtual meeting
5	Dr Amitava Ghosh	Online meeting with Dr D Bhaduri from Cardiff University, UK for possibility of collaboration	February 2021, Cardiff University, UK
6		Online meeting with Prof Papken H from Sheffield Hallam University for collaborative research	February-March 2021, Sheffield, UK
7	Dr K. Anand	Waste to engine – low-temperature combustion of sustainable green fuels, UKIERI Project Meeting at Aston University, UK	January 2020, Aston University, Birmingham, UK
8	Dr Ramkumar P	Board of Studies (BoS)	24 February 2021, SA Engineering College, Chennai, India (online)
9		Board of Studies (BoS)	29 December 2020, Rajalakshmi Engineering College, Chennai, India (online)
10		Interview - RUSA 2.0 Electric Vehicle Project - External Subject Expert	11 February 2021, College of Engineering Guindy, Anna University, Chennai
11	Dr A Seshadri Sekhar	Selection Committee-Recruitment of Assistant Professors/Associate Professors in the Department of Mechanical Engineering	21-22 December 2020, IITDM, Kurnool, India (via Google Meet)
12		Examiner for Ph.D. viva	14 July 2020, Department of Mechanical and Manufacturing Engineering Manipal Academy of Higher Education, Manipal (via Google Meet)
13		Examiner for Ph.D. viva	27 October 2020, Department of Mechanical Engineering, IIT Delhi, New Delhi (via Google Meet)
14	Dr Raghu V Prakash	BITS, Pilani campus, Goa	3 January 2020, Goa

## 4.14 Department of Metallurgical and Materials Engineering

### 4.14.1. Introduction

The Department of Metallurgical and Materials Engineering (MME) was established in 1959 as the Department of Metallurgy. It was renamed as Department of Metallurgical and Materials Engineering in 2003. The department is actively engaged in research, education and industrial consultancy. Its teaching, research and consultancy activities cover a broad spectrum, ranging from conventional metallurgy to frontiers of materials science and engineering. The department is respected for its strong linkages with industry and expertise in industrial metallurgy. Over the years, it has hosted excellent

research infrastructure in the broad areas of material science and engineering, such as materials processing (forming, joining, casting, particulate processing and nanostructured materials), characterisation (X-ray diffraction, electron microscopy and thermal analysis), mechanical testing, corrosion engineering, surface engineering, computational materials science and electronic materials. The department continues to strive for excellence and realising its vision of becoming a pioneering department in the areas of materials science and engineering, while consolidating its strength in traditional areas of metallurgical engineering.

### 4.14.2. Academic Programmes

The department offers B.Tech., M.Tech., M.S. and Ph.D. programmes.

**New lab introduced:** Laboratory for Mechanics of Microstructures

#### Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	66	51	33	27	13	190
Dual Degree			13	17	16	46
M.Tech.	29	19	2	0	0	50
M.S.	12	9	12	9		42
Ph.D.	23	16	37	22	68	166
Total	130	95	97	75	97	494

#### Students/Scholars who attended conferences/seminars/workshops/symposia abroad/India

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposia/ Workshop	Date and Venue
<b>Abroad</b>				
1	Darshan Chalapathi	MM16D001	International Conference on Textures of Materials (ICOTOM 19)	1-4 March 2021, Japan
2	Mainak Saha	MM18D704	Indo-German Workshop on Advanced Automotive Steels (IGWAAS 2021)	4-5 March 2021, India
3	Amit Singh	MM19S007	19th International Conference of Texture of Materials (ICOTOM 19)	1-4 March 2021, Japan
4	Amit Singh	MM19S007	Chemnitz MTEX-2021 workshop	8-12 March and 15-17 March 2021, Germany

5	Achnitya Kumar Patra	MM17D410	COTOM 19	1-4 March 2021, Japan
6	Achnitya Kumar Patra	MM17D410	Chemnitz MTEX-2021 workshop	8-12 March and 15-17 March 2021, Germany
7	Shubhashis Dixit	MM15D200	Material Science and Engineering Congress (MSE 2020)	22-27 September 2020, Darmstadt, Germany
8	Barun Bharadwaj Dash	MM16D200	MSE 2020	22-27 September 2020, Darmstadt, Germany
9	Abhinav Kumar Karnati	MM17D027	Chemnitz MTEX-2021 workshop	8-12 March and 15-17 March 2020, Germany
10	Sourav Ghosh	MM17D301	Conference on a FAIR Data Infrastructure for Material Genomics	3-5 June 2020, Germany
11	Pritam Banerjee	MM16D416	Virtual Characterisation of Organic- Inorganic Interfaces	11-12 March 2021, Virtual conference
12	Pritam Banerjee	MM16D416	Microscopy Society of Ireland Symposium	6-7 January 2021, Virtual conference
13	Darshan Chalapathi	MM16D001	Chemnitz MTEX-2021 workshop	8-12 March and 15-17 March 2021, Germany
<b>India</b>				
1	Anbuthangam A	MM16D302	International Online Congress on Membranes and Membrane Assisted (ICMMAP 2021)	12-14 February 2021, India
2	V S Hariharan	MM18D401	58th National Metallurgists Day and 74th Annual Technical Meet (NMD-ATM 2020)	12-14 February 2021, India
3	Sourav Ghosh	MM17D301	Science, Technology, and Innovation talks by Young Research Fellows, ARCI	23-26 February 2021, India
4	Sourav Ghosh	MM17D301	Students Research Convention 2021, IIT Kanpur	
5	Sourav Ghosh	MM17D301	Students' Academic Conference, 9th Inter IIT Tech Meet, IIT Guwahati	27-28 March 2021, India
6	Sufyan M. Shaikh	MM17D202	58th National Metallurgists Day and 74th Annual Technical Meet (NMD-ATM 2020)	23-26 February 2021, India
7	Manikandan G	MM15D302	Soft Matter: Young Investigators e-Meet (SMYIM-2020)	3-5 December 2020, India

**Students/Scholars who won outside prizes and awards**

S.No.	Student/Scholar	Roll No.	Prize	Prize awarded by
1	V S Hariharan	MM18D401	Best oral presentation award under Computational Materials Science and Process Modelling in NMD-ATM 2020	IIM
2	Sourav Ghosh	MM17D301	Best Research Award in the Conference on Chemistry and Chemical Engineering at Students Research Convention 2021, IIT Kanpur	IIT Kanpur
3	Sourav Ghosh	MM17D301	Winner in Environment/Energy/Power domain at Students' Academic Conference, 9th Inter IIT Tech Meet, IIT Guwahati	IIT Guwahati
4	Sufyan M. Shaikh	MM17D202	Popular Science Story (in Top- 100 Under PhD Category), Augmenting Writing Skills for Articulating Research (AWSAR) 2020	Department of Science and Technology, National Council for Science and Technology Communication, Vigyan Prasar
5	Manikandan G	MM15D302	Soft Matter poster prize at Soft Matter: Young Investigators e-Meet (SMYIM- 2020)	Royal Society of Chemistry (RSC)

**Students/Scholars who won Institute Convocation/Institute Day Prize**

S.No.	Student/Scholar	Roll No.	Prize
1	Arvind Pujari	MM16B017	Shankar Dayal Sharma Prize
2	Hari Ramachandran	MM15B040	Governor's Prize
3	K R Kumaresh	MM16B007	Dr Dhandapani Memorial
4	Mythreyi Ramesh	MM15B022	S. Anantharamakrishnan Memorial Prize
5	Supriya Anand	MM18M023	Sudharshan Bhatt Memorial Prize (M.Tech)
6	Hari Ramachandran	MM15B040	Institute Merit Prize
7	M R Rahul	MM15D012	Sudharshan Bhatt Memorial Prize (Ph.D.)
8	K R Kumaresh	MM16B007	Vijay Jagannathan Award
9	Arvind Pujari	MM16B017	B. Krishnamurthy Award
10	S N Manoj	MM17D005	Institute Research Award
11	J U Nandhini	MM14D405	Institute Research Award

**4.14.3. Faculty and their specialisations****Faculty**

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
N.V. Ravi Kumar, Ph.D. (MPI-Stuttgart and University of Stuttgart, Germany) <b>(HoD)</b>	Processing and characterization of precursor derived ceramics, atomistic design/molecular design/microstructure design for the development of high-performance ceramics, investigation of thermal and mechanical properties and correlation with structure

M. Balasubramanian, Ph.D. (IIT Madras)	Advanced ceramics and composites, nanocomposites processing, materials characterization
S.S. Bhattacharya, Ph.D. (IIT Madras)	Nanocrystalline materials—synthesis, consolidation, characterisation and property evaluation, superplasticity of materials (analytical and experimental), superplastic forming, advanced materials testing
S. Ganesh Sundara Raman, Ph.D. (IIT Madras)	Fatigue and fracture of metallic materials and their weldments, fretting fatigue, fretting wear, high-temperature deformation, coatings, thermal spray processing, surface engineering
K.C. Hari Kumar, Ph.D. (IIT Delhi)	Computational thermodynamics and kinetics, ab initio calculations of thermochemical and thermophysical properties
M. Kamaraj, Ph.D. (IIT Madras)	High-temperature deformation studies on steels/super alloys, hot-corrosion studies, surface technology, development of wear surfacing materials, tribological studies on weld deposits/coatings/composites, failure analysis
B.S. Murty, Ph.D. (IISc, Bengaluru) (On lien - currently at IIT Hyderabad)	Nanocrystalline materials, bulk metallic glasses, high-entropy alloys, composites, phase transformations, electron microscopy, atom probe tomography
G. Phanikumar, Ph.D. (IISc, Bengaluru)	Solidification using electromagnetic levitation and melt spinning, transport phenomena in manufacturing processes, microstructure simulation and characterization
Prathap Haridoss, Ph.D. (University of Wisconsin-Madison, USA)	Production and characterisation of carbon nanotubes, synthesis of CdS nanocrystals, CO-tolerant PEM fuel cell catalysts
Ranjit Bauri, Ph.D. (IISc, Bengaluru)	Metal matrix composites, aluminium alloys, solid oxide fuel cells
V. Sampath, Ph.D. (IISc, Bengaluru)	Shape memory alloys/smart materials, composite materials, powder metallurgy, structure-property correlations in materials
T.S. Sampath Kumar, Ph.D. (IISc, Bengaluru)	Nanostructured biomaterials, antimicrobial ceramics and delivery systems, value-added biomaterials from natural wastes
S. Sankaran, Ph.D. (IIT Kanpur)	Mechanical behaviour of materials, electron microscopy, structure-property correlations
Somnath Bhattacharyya, Ph.D. (MPI-Stuttgart and University of Stuttgart, Germany)	Studying correlation of the structure and chemistry of materials at atomic scale with physical properties using transmission electron microscopy, development of new methodology related to TEM/STEM to study materials, studying nano-bio conjugation using electron probe
V. Subramanya Sarma, Ph.D. (IIT Madras)	Materials processing, development, characterisation and microstructure, mechanical property correlations in engineering materials
Uday Chakkingal, Ph.D. (Rensselaer Polytechnic Institute, USA)	Metal forming and material processing, severe plastic deformation processes, aluminium alloys, sheet metal forming
<b>Associate Professors</b>	
Ajay Kumar Shukla, Ph.D. (IIT Kanpur)	Process modeling, control and optimisation of iron and steel making, computational thermodynamics and its application to high-temperature metallurgical processes, heat and mass transfer
Anand K. Kanjarla, Ph.D. (Katholieke Universiteit Leuven Belgium)	Microstructural approach to mechanics of materials, finite element method and fast Fourier transform approach to crystal plasticity (CPFEM and CPFET), plastic anisotropy and crystallographic texture, microstructure evolution in irradiated systems



Lakshman Neelakantan, Ph.D. (MPIE Dusseldorf and RUB, Bochum, Germany)	Corrosion characteristics, smart coating for corrosion protection, electro-dissolution, planarisation and deposition
Manas Mukherjee, Ph.D. (Technical University Berlin, Germany)	Metal foam production and characterisation, physics of foaming, X-ray tomography, solidification
K. Ravi Sankar, Ph.D. (IISc, Bengaluru)	High-temperature deformation, super plasticity, nanocrystalline materials, size effects in plastic deformation
Parasuraman Swaminathan, Ph.D. (University of Illinois, Urbana- Champaign, USA)	Printed electronics, vapour-deposited thin films and nanoparticles, optical and electrical properties of doped metal oxides, photovoltaics
Srinivasa Rao Bakshi, Ph.D. (Florida International University, Miami, USA)	Thermal spraying, carbon nanotube-reinforced composites, microstructure property correlations at different length scales, nuclear materials
Sabita Sarkar, Ph.D. (IISc, Bengaluru)	Process modelling/design of metallurgical and chemical processes, modeling and simulation of flows through packed beds, fluidised beds, heat and mass transfer, granular flows, multi-phase flows, reacting flows
Tiju Thomas, Ph.D. (Cornell University, USA)	Energy materials, environmental remediation materials [nitrides, oxynitrides, oxides (in nano, meso and bulk forms)], photofunctional materials (for solar cells, photocatalytic applications), optical materials and devices, surfaces, interfaces and transformation of nanostructures, green approaches to functional nanomaterials

**Assistant Professors**

Murugaiyan Amirthalingam, Ph.D. (Delft University of Technology, Netherlands)	Welding metallurgy, welding processes development, steels product development, in situ 3D synchrotron X-ray diffraction and additive manufacturing
Sreeram K. Kalpathy, Ph.D. (University of Minnesota, USA)	Soft matter: colloid and polymer science, interfacial fluid mechanics, physical chemistry of surfaces, coating and printing methods
Satyesh Kumar Yadav, Ph.D. (University of Connecticut, USA)	Physics and chemistry of materials from first-principles electronic structure modelling, first-principles thermodynamics, modeling of materials using quantum mechanics derived potentials, understanding structure, property, and processing relation of materials
K. G. Pradeep, Ph.D. (MPIE-Düsseldorf and RWTH Aachen University, Germany)	Combinatorial alloy design, atom probe tomography and field ion microscopy, magnetic materials, thin films and hard coatings, correlative microscopy, amorphous and nanocrystalline materials, mechanical behaviour of materials

**Adjunct Faculty**

R. Gopalan, Ph.D. (IIT Madras), Associate Director and Head, Centre for Automotive Energy Materials, ARCI, Chennai	Magnetic materials, thermo-electric materials, fuel cells
Raju Ramanujan, Ph.D. (CMU, USA), Professor, NTU, Singapore	Nanofunctional materials
T. Venugopalan, Ph.D. (NIT, Rourkela)	R&D in steel technology
M. Sundararaman, Ph.D. (University of Mumbai)	Phase transformation and structure property correlation in metallic materials, ordered-disordered transformation under equilibrium and non-equilibrium conditions, micromechanics of plasticity, material characterisation, physical metallurgy of super alloys, defect analysis using microscopy



**Short-term courses/workshops/seminars/symposia/conferences organised by the faculty members**

S.No.	Coordinator	Title	Period
<b>Workshop</b>			
1	Dr K. C. Hari Kumar	Live Training Sessions with Thermo- Calc	24-28 August 2020
<b>Short-term course</b>			
1	Dr M. Kamaraj	Indian Institute of Metals' Joint Training Course on Metallurgical Failure Analysis of Industrial Components	2-4 September 2020

**Short-term courses/workshops/seminars/symposia/conferences/trainings attended by the faculty members in academic institutions and public sector undertakings**

S. No.	Faculty Member	Title	Institution	Period
<b>Workshops</b>				
1	Dr K C Hari Kumar	Thermodynamic Modelling of Ceramic Systems	Materials Science and Engineering - MSE 2020 Digital Congress, German Materials Society (DGM)	21-25 September 2020
2	Dr K. C. Hari Kumar	Discussion on Computational Materials Science	VAIBHAV Summit	9 October 2020
3	Dr N. V. Ravi Kumar	Discussion on Materials and Processing Technologies	VAIBHAV Summit	29 October 2020
4	Dr Murugaiyan Amirthalingam	Additive Manufacturing	VAIBHAV Summit	14 October 2020
<b>Conference</b>				
1	Dr Sundararaman M	Structural Materials for Nuclear and Space Applications	Bhabha Atomic Research Centre	3-6 December 2020

**Special lectures delivered by the faculty in other institutions**

S. No.	Faculty Member	Topic of Lecture	Institution	Date
1	Dr Murugaiyan Amirthalingam	Use of additive manufacturing for disaster management	NPTEL (Youtube Live Session)	18 April 2020
2	Dr K. G. Pradeep	Combinatorial materials design coupled with high throughput atomic scale analysis	IIT Bombay	6 June 2020
3	Dr Murugaiyan Amirthalingam	How to avoid brain Drain	Fronius India - Academicians Conclave 2020, Fronius International	19 June 2020
4	Dr M. Balasubramanian	Ceramic matrix composites	Rajalakshmi Engineering College	14 July 2020
5	Dr M. Balasubramanian	Polymer-clay nanocomposites	Rajalakshmi Engineering College	1 September 2020

S. No.	Faculty Member	Topic of Lecture	Institution	Date
6	Dr M. Kamaraj	Creep and high perature damage of components	Indian Institute of Metals	2 September 2020
7	Dr S. Ganesh Sundara Raman	Fretting fatigue	Presidency University, Bengaluru	12 September 2020
8	Dr K. G. Pradeep	Atom probe microscopy: fundamentals and applications	FDP at NIT Andhra Pradesh	20 October 2020
9	Dr K. C. Hari Kumar	Thermo-calc and Tools	CCE IIT Madras/Tata Steel Jamshedpur	November 2020 onwards (72 hours' live session)
10	Dr Murugaiyan Amirthalingam	Additive manufacturing – principles and practices	AICTE Faculty Development Programme, MACE institutions	18 November 2020
11	Dr M. Balasubramanian	Processing of polymer nanocomposites	Hindustan Institute of Technology and Science	27 November 2020
12	Dr Sundararaman M	Physical metallurgy of alloy 718 and its derivatives	International e- Conference on Structural Materials for Nuclear and Space Applications (SNSA20), Bhabha Atomic Research Centre, Mumbai 400085	3-6 December 2020
13	Dr S. Sankaran	Recent advances on rolling processes	NIT Nagaland	7 December 2020
14	Dr Uday Chakkingal	Sheet metal forming	NIT Nagaland	8 December 2020
15	Dr S. Sankaran	Deformation behaviour of titanium alloys at high strain rates	College of Engineering Pune	17 December 2020
16	Dr Lakshman Neelakantan	Fundamentals of corrosion	STSI programme- Hokkaido University, Japan	21 December 2020
17	Dr Lakshman Neelakantan	Pipeline corrosion: corrosion mechanisms and protection	Tubes and Pipes for Potable Water and Sanitation- ITA India Chapter	22 January 2021
18	Dr Subramanya Sarma	High strength-high ductility medium Mn steel obtained through CALPHAD based alloy design and thermomechanical processing	58th National Metallurgists' Day (NMD) and the 74th Annual Technical Meeting (ATM) of the Indian Institute of Metals	23-26 February 2021
19	Dr Sreeram Kalpathy	Interfacial phenomena in complex fluids and soft matter: some recent exciting results	IIT Gandhinagar	February 2021
20	Dr Prathap Haridoss	Online education: opportunities and challenges	Indian Navy - webinar on Armed Forces Training, Naval Institute of Aeronautical Training (NIAT)	25 March 2021

**Honours obtained by faculty**

S. No.	Faculty Member	Honour	Awarded by	Awarded for	Date of Award
1	Dr Murugaiyan Amirthalingam	Member, Technical Management Board	International Institute of Welding	Contribution to Welding	2020-2023
2	Dr Murugaiyan Amirthalingam	Chairman, Technical Committee	Indian Institute of Welding	Contribution to Welding	2021-2022
3	Dr Murugaiyan Amirthalingam	Central Council Member,	Indian Institute of Welding	Contribution to Welding	2021-2022

**Fellowships of academies and professional societies**

S. No.	Faculty Member	Year of Admission
<b>INAE</b>		
1	Dr B. S. Murty	2007
<b>INSA</b>		
1	Dr B. S. Murty	2013
<b>Others</b>		
FASM (Fellow of ASM International, USA)	Dr B. S. Murty Dr M. Kamaraj	2010 2018
FIWS (Fellow of Indian Welding Society)	Dr M. Kamaraj	2018
FIE (Fellow of Institution of Engineers)	Dr M. Kamaraj	
FIMSA (Fellow of International Medical Sciences Academy)	Dr T. S. Sampath Kumar	2007
FBOA (Fellow of Society of Biomaterials and Artificial Organs)	Dr T. S. Sampath Kumar	2011
FTWAS (Fellow of The World Academy of Sciences)	Dr B. S. Murty	2018
FAPAS (Fellow of Andhra Pradesh Academy of Sciences)	Dr B. S. Murty	2016
FIIM (Fellow of Indian Institute of Metals)	Dr B. S. Murty Dr M. Kamaraj	2015 2019
FAPAM (Fellow of Asia Pacific Academy of Materials)	Dr B. S. Murty	2013
FIAS (Fellow of Indian Academy of Sciences)	Dr B. S. Murty	2008
FNAS (Fellow of National Academy of Sciences)	Dr B. S. Murty	2008

**Journal Editorial Boards**

S.No.	Faculty Member	Position	Journal
1	Dr Uday Chakkingal	Associate Editor	<i>Sadhana</i>
2	Dr K.C. Hari Kumar	Editorial Board member	<i>MSI Eureka, Materials Science International Team (MSIT)</i>
3	Dr N.V. Ravi Kumar	Associate Editor	<i>Advances in Materials Science and Engineering</i>
4	Dr Srinivasa Rao Bakshi	Editorial Board member	<i>Composite Interfaces</i>
5	Dr Murugaiyan Amirthalingam	Principle Reviewer and Corresponding Editor	<i>Welding in the World</i>

#### 4.14.4. Design and Development Activities

##### **Brief and specific details of process/instruments/equipment/software designed and developed**

1. Stand-alone Miniature In-situ Multiaxial Universal Testing Equipment (IsMUTE) is developed by Prof. Ravi Kumar N.V. along with Mr Lalith Kumar Bhaskar and Mr Gobind Kumar.



*The photograph of an indigenously developed in-situ multiaxial universal testing equipment*

A novel stand-alone multi-axial loading test set-up was developed to test miniature samples under uniaxial tension, uniaxial compression, in-plane biaxial tension and biaxial compression stress states. Good agreement in stress-strain responses was observable between the uniaxial experiments carried out using the miniature sample geometry in the custom-built set-up and the uniaxial standard geometry in a universal testing machine. Regarding biaxial experiments, the full-field strain captured using digital image correlation for the biaxial specimens reveals strain homogeneity in the central gage section of the sample. Furthermore, the in-situ capability of the set-up is demonstrated by integrating it with a commercial laboratory x-ray diffractometer, and good agreement was found between the calculated stress values from the load sensor and the stress obtained using x-ray diffraction. The brief specifications of the developed loading fixture are as follows:

Dimensions: 400 mm × 400 mm × 175 mm (fixture alone)/1000 mm (with DIC and controller set-up)  
Displacement stroke: 70 mm on each axis  
Maximum loading capacity: 10000 N  
Operational loading capacity: 8000 N  
Cross head displacement rate: 0.00005 mm/s to 0.2 mm/s  
Loading rate: 2 N/s to 300 N/s

**New facilities added or major equipment procured**

S. No.	Equipment	Value (Rs. in lakh)
1	Flame spray pyrolysis equipment	110
2	High-temperature muffle furnace (1700°C)	5
3	High-temperature (1700°C) tubular furnaces (horizontal as well as vertical arrangements)	18
4	Hybrid microwave heating furnace with computer control	17
5	Computerized shaping machine	4
6	Jar mill	0.9
7	CO generator	0.9
8	Struers automatic polishing machine	16
9	Chennai Metco manual polishing machine	1
10	Spin coating unit with UV curing HO-TH- 05C from Holmarc	1.92
11	Programmable spray coater HO-TH- 04C4 from Holmarc	8.17
12	High-speed tabletop cooling centrifuge C-24 plus from REMI	2.23
13	Magnetron sputtering machine (ATS 500)	52
14	Horizontal creep machines fitted with three furnaces (3 Nos)	12
15	High-temperature DIC set-up for a horizontal creep frame	4
16	Hot mounting machine	0.6
17	Glove box	4.5
18	Viscometer	9.35
19	Microplasma wire arc additive manufacturing facility	15
20	Planetary ball mill	10
21	Vacuum freeze dryer	9
22	Rotating disc electrode set-up	5
23	HPLC System with RID detector	20.33
24	Electro-spinning unit	4.36
25	UV Visible NIR spectroscope	35

**Patents****Patents filed**

S. No.	Faculty Member	Topic of Patent
1	Nitheesh M. Nair, Debductta Ray and P. Swaminathan	A conducting electrochromic composite of metallic nanowires and multi-coloured thermochromic materials
2	Lalith Kumar Bhaskar, Gobind Kumar and Prof. Ravi Kumar	Standalone Miniature In-situ Multiaxial Universal Testing Equipment (IsMUTE)

**Patents awarded**

S. No.	Faculty Member	Topic of Patent
1	K. C. Hari Kumar, N. Maheshwari, S. Sankaran	Method for producing quench and partitioned steel with dual phase microstructure and improved mechanical properties, Patent No. 349064

2	Papa Rao M, Sankaran, S. Subramanya Sarma, V.	Processing of the bimodal ultrafine grained microalloyed dual phase steel sheets, Indian patent No. 343171 (filed in 2013 and awarded in 2020)
3	Talluri Bhusankar, Tiju Thomas	Digestively-ripened seed/nucleus-driven rapid and high yield synthesis of monodispersed ceramic/compound semiconductor nanoparticles (2017) (IIT Madras IDF-1567 - Indian Patent application no. 201741026903); filing date: 28 July 2017; patent granted: Registration No. 350425
4	T.S. Sampath Kumar and Uday Chakkingal	An improved process for controlled degradation of grain refined magnesium alloy in temporary orthopedic implants, 353777 (Indian)

#### 4.14.5. Research and Consultancy

##### Sponsored research projects (ongoing and new)

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
<b>New</b>					
1	High entropy alloys for high temperature aircraft components (for industry)	17 December 2018-16 December 2021	GE India Industrial Private Limited	15.00	Subramanya Sarma V, BS Murty
2	Transsition	16 July 2020- 15 July 2021	UK Research and Innovation	49.85	Tiju Thomas, Arshinder Kaur
3	Ionic transport properties of nanocrystalline high entropy oxides	28 September 2020-27 September 2023	DST	35.5	Bhattacharya SS
4	Graphene-based composite design and its transport property studies for optimizing readily printable thermal interface materials (TIM)	1 October 2020-30 September 2021	Intel Technology India Private Limited	7.5	Tiju Thomas
5	Alloy development for additive manufacturing of prostheses and reconstructive implants	15 October 2020-31 March 2021	Universitetet i Stavanger	2.72	Murugaiyan Amirthalingam, Lakshman Neelakantan, Durga Janaki Ram Gabbita
6.	Polymer-derived Zr-B-C based rare earth metal containing high temperature resistant coatings for space applications	2 November 2020-1 November 2022	ISRO	31.50	Ravikumar NV
7.	Fabrication of nanostructured copper surfaces for functional applications	30 December 2020-29 December 2023	SERB	39.09	Manas Mukherjee, Lakshman Neelakantan
8	A novel integration of TiO <sub>2</sub> nanotubes and hydrogen storage alloy for a solar- water based rechargeable fuel cell battery	5 November 2020-4 November 2022	DST	11.10	Ranjit Bauri

9	Nanostructured biomimetic coatings on Ti alloys for enhanced biofilm resistance	9 December 2020-8 December 2023	SERB	10.05	Sampathkumar TS
10	Fenton-process adapted for deactivation of antimicrobial resistant genes and antibiotic removal using passivation- bypassed Fe-alloy, rate- controlled using photo- activity	30 December 2019-29 December 2022	DST	30.17	Tiju Thomas, Indumathi Manivannan Nambi
11	Validating novel eggshell derived bone regenerative bioceramics	3 December 2020-2 June 2022	Biotechnology Industry Research Assistance Council	24.05	Sampathkumar TS, Balasubramanian M
12	Fatigue life prediction methodology for additive manufactured high temperature nickel alloys with process-structure- property considerations	14 December 2020-13 December 2023	SERB	10.05	Sampath V
13	Alloy development for additive manufacturing of prostheses and reconstructive implants (Short name: MetAMeT Metal Additive Medical Technology)	1 March 2021-29 February 2024	DST	43.57	Murugaiyan Amirthalingam, Lakshman Neelakantan Durga Janaki Ram Gabbita
14	Non-noble plasmonics and BaTaO <sub>2</sub> -xNy/CuO quantum dot heterostructure based photocatalysts for tandem grey water reactors	29 December 2020-28 December 2023	SERB	36.11	Tiju Thomas, Indumathi Manivannan Nambi, Sreeram Kalpathy
15	Stability of microstructure under thermal and stress conditions in Alloy718 Plus	23 March 2021-22 March 2024	SERB	44.81	Sankaran S, Shyam Keralavarma, Sundararaman Mahadevan
16	Repository of high-performance phase-field solvers for microstructure simulation (MicroSim)	12 March 2021-11 March 2023	National Supercomputing Mission	25.49	Gandham Phanikumar

**Ongoing**

1.	Centre of Excellence in Iron and Steel Technology (COEXIST)	9 May 2017-8 May 2022	Steel Ministry	3555	K.C. Hari Kumar and some MME faculty members
2.	Cold spray technology development for repair and coating of aircraft engine components	27 October 2016-26 May 2021	UAY	520	M. Kamaraj, SR Bakshi, G. Sundarajan
3.	In-situ experimental and numerical studies of abnormal grain growth and twinning during annealing of cold worked nickel	20 March 2018-21 September 2021	DST	82.59	Subramanya Sarma and Srikanth Vedantam



4.	Non-destructive, atomically resolved off-stoichiometry determination within nanostructures using intensity distribution of scanning transmission electron microscopic (STEM) images	21 March 2018-20 June 2021	DST	33.22	Somnath Bhattacharyya
5.	Development of liquid metal processing route for closed cell magnesium foam	12 September 2017-10 September 2021	DST-SERB	16.20	Manas Mukherjee
6.	Stress-rupture property evaluation of advanced superalloys for small turbo fan engine (STFE) technologies	30 May 2017-29 May 2021	DRDO	435.61	Ravi Sankar K.
7.	High-temperature erosion damage characterization of downstream components by particle erosion testing	30 May 2017-30 June 2021	DRDO	115.29	S.R. Bakshi, M. Kamaraj, Prasad BVSSS, Chakravarthy SR
8	Characterization of selective laser melted Inconel 718 and Ti-6Al-4V	30 May 2017- 30 June 2021	DRDO	161.52	Ravi Sankar K, Ganesh Sundara Raman, Durga Janaki Ram Gabbita, Prasad BVSSS, Subramanya Sarma V, Chakravarthy SR S
9	Microwave assisted reduction of iron ore/slimes: an innovative and cost-effective approach for steel production	30 December 2017-31 March 2022	Impacting Research Innovation and Technology - IMPRINT	331.80	Ajay Kumar Shukla
10	JC Bose Fellowship	12 November 2018-11 November 2023	DST	95	Murty BS
11	National Centre for Clean Coal Research and Development - WP8	13 September 2018-12 September 2023	DST	116.55	Gandham Phanikumar, Murugaiyan Amirthalingam
12	National Centre for Clean Coal Research and Development - WP9	13 September 2018-12 September 2023	DST	92.80	Sankaran S, Gandham Phanikumar
13	National Centre for Clean Coal Research and Development - WP6	13 September 2018-12 September 2023	DST	22.84	Gandham Phanikumar, K.C. Hari Kumar



14	Friction stir processing (FSP) of Al 7075 alloy and investigation on thermal stability and high temperature mechanical properties	7 July 2018-6 July 2021	Aeronautics Research & Development Board	36.81	Ranjit Bauri
15	VAJRA Visiting Faculty - Dr Juergen Eckert	4 May 2018-3 May 2021	DST	33.69	Murty BS
16	Electrosprayed nano structures for the sustained release of anti-glaucoma drugs	7 September 2018-6 September 2021	DBT	55.25	Sampathkumar TS, Ravikumar NV
17	Enhancement of creep rupture, hot corrosion and liquation cracking resistance of Alloy 617M through grain boundary engineering	11 October 2018-10 October 2021	ARCI	272.98	Subramanya Sarma V, M. Kamaraj
18	Development of self-cleaning coatings on glass using TiO <sub>2</sub> nanoparticles developed at Indian Rare Earth Limited	6 September 2018-5 September 2021	Indian Rare Earths Limited	78.68	Murty BS
19.	Investigation of tribological and rolling contact fatigue analysis of AISA 52100 steel with micro and nano additives dispersed in vegetable and mineral oil	11 November 2018-10 November 2021	DST-SERB	10.05	Kamaraj M
20.	Tailoring tantalum nitrides and oxy-nitrides and designing electrocatalytic devices for green energy	15 March 2019-14 September 2021	Scheme for Promotion of Academic and Research Collaboration	63.83	Ravikumar NV, KC Hari Kumar
21	High-entropy alloys for high-temperature aircraft components	15 December 2018-14 December 2021	Impacting Research Innovation and Technology - IMPRINT	44.83	Murty BS, Subramanya Sarma V, Arul Prakash K
22	Development of oxide dispersion strengthened steels for supercritical thermal boilers and fusion reactors	7 May 2018-6 May 2021	Uchhatar Avishkar Yojana - IIT Madras	378.3	Murty BS
23	Understanding the evolution of residual stress during repair and refurbishment of gas turbine components via laser additive manufacturing	7 May 2018-6 May 2021	Uchhatar Avishkar Yojana - IIT Madras	66.04	Gandham Phanikumar
24	Combinatorial design of novel rare-earth free, high-entropy based permanent magnets	1 June 2018-31 May 2021	Max Planck Institute for Nuclear Physics	38.85	Pradeep KG
25	Estimation of physical properties of slag and investigation of slag morphology during solidification and development of mathematical model to estimate heat transfer coefficient in continuous casting molds	22 July 2019-21 July 2021	DST	7.44	Ajay Kumar Shukla

26	Ionogel electrolyte membrane fuel cell (IEMFC) with plasma electrolytic nitrated (PEN) metallic bipolar plate and effective flow field design	2 September 2019-1 September 2022	DST	56.74	Lakshman Neelakantan, Raghuram Chetty, Kothandaraman Ramanujam, Arul Prakash K
27	Understanding the phase stability of oxides and nitrides in the context of fine tuning their functional properties—a combinatorial approach based on computations and experiments	26 June 2019- 25 June 2021	DST	5.67	Ravikumar NV, KC Hari Kumar
28	Oxynitride-composites based low weight supercapacitor unit: materials enhancement and device development	20 September 2019-19 September 2022	DST	33.17	Tiju Thomas, Ranga Rao G, Jeevandoss CR
29	Silver nanowire-based transparent and flexible tactile and force sensors	30 December 2019-29 December 2022	Ministry of Education	46.04	Parasuraman Swaminathan
30	Physical and mathematical modelling of centrifugal atomization process for powder production	30 March 2019-29 March 2022	SERB	42.43	Sabita Sarkar, Sreeram Kalpathy
31	Combinatorial design on novel, rare-earth free permanent magnets	24 June 2019- 23 June 2022	SERB	49.58	Pradeep KG
32	Hierarchically designed electrodes of air breathing zinc-ion batteries	4 March 2020-3 March 2023	SERB	44.39	Ranjit Bauri
33	Investigation of novel high temperature shape memory alloys for critical applications	6 March 2020-5 March 2023	SERB	60.66	Sampath V
34	Synthesis and characterization of ZrO <sub>2</sub> dispersed Ti, Ti-6Al-4V, Ti- 6Al-5V, Ti-6Al-7Nb	1 November 2019-31 October 2022	SERB	10.05	Kamaraj M
35	Rational design of non-stoichiometric transition metal compounds	3 December 2019-2 December 2021	SERB	17.64	Satyesh Kumar Yadav
36	Development and tribological study of multilayer nitride coatings on surface modified Co-Cr-Mo alloy against cross linked polymer surface in wet sliding environment for orthopaedic applications	18 November 2019-17 November 2022	SERB	10.05	Kamaraj M

37	Processing, joining and microstructure modeling of net shaped casting of primary Al-Zn-Mg alloys through an integrated computational materials engineering (ICME) approach	30 April 2019- 29 October 2021	Scheme for Promotion of Academic and Research Collaboration	73.05	Ranjit Bauri, Phanikumar G
38	Quantum mechanically guided design and multi-scale characterisation of novel, interface strengthened multi-principal element compositionally complex alloys	28 March 2019-27 September 2021	Scheme for Promotion of Academic and Research Collaboration	68.51	Murty BS, Pradeep KG
39	Alloy development through artificial intelligence (ADAI) - development of tool steel	7 September 2019-6 September 2021	Mishra Dhatu Nigam Limited	17.28	Gandham Phanikumar
40	A novel integration of TiO <sub>2</sub> nanotubes and hydrogen storage alloy for a solar water based rechargeable fuel cell battery	5 November 2020-4 November 2022	DST	11.10	Ranjit Bauri
41	Alloy development for additive manufacturing of prostheses and reconstructive implants (short name: MetAMeT, Metal Additive Medical Technology)	1 March 2021-29 February 2024	DST	43.57	Murugaiyan Amirthalingam, Lakshman Neelakantan Durga Janaki Ram Gabbita
42	Ionic transport properties of nanocrystalline high entropy oxides	28 September 2020-27 September 2023	DST	35.53	Bhattacharya SS
43	Fenton-process adapted for deactivation of antimicrobial resistant genes and antibiotic removal using passivation- bypassed Fe-alloy, rate- controlled using photo- activity	30 December 2019-29 December 2022	DST	30.17	Tiju Thomas, Indumathi Manivannan Nambi
44	Fatigue life prediction methodology for additive manufactured high temperature nickel alloys with process-structure- property considerations	14 Decembe 2020-13 December 2023	SERB	10.05	Sampath V
45	Non-noble plasmonics and BaTaO <sub>2-x</sub> Ny/CuO quantum dot heterostructure based photocatalysts for tandem grey water reactors	29 December 2020-28 December 2023	SERB	36.11	Tiju Thomas, Indumathi Manivannan Nambi, Sreeram Kalpathy
46	Stability of microstructure under thermal and stress conditions in Alloy718 Plus	23 March 2021-22 March 2024	SERB	44.81	Sankaran S, Shyam Keralavarma, Sundararaman Mahadevan

47	Fabrication of nanostructured copper surfaces for functional applications	30 December 2020-29 December 2023	SERB	39.09	Manas Mukherjee, Lakshman Neelakantan
48	Nanostructured biomimetic coatings on Ti alloys for enhanced biofilm resistance	9 December 2020-8 December 2023	SERB	10.05	Sampathkumar TS
49	Validating novel eggshell derived bone regenerative bioceramics	3 December 2020-2 June 2022	Biotechnology Industry Research Assistance Council	24.05	Sampathkumar TS, Balasubramanian M
50	High entropy alloys for high temperature aircraft components (for industry)	17 December 2018-16 December 2021	GE India Industrial Private Limited	15.00	Subramanya Sarma V, Murty BS
51	Transsition	16 July 2020- 15 July 2021	UK Research and Innovation	49.85	Tiju Thomas, Arshinder Kaur
52	Repository of high-performance phase-field solvers for microstructure simulation (MicroSim)	12 March 2021-11 March 2023	National Supercomputing Mission	25.49	Gandham Phanikumar
53	Graphene-based composite design and its transport property studies for optimizing readily printable thermal interface materials (TIM)	1 October 2020-30 September 2021	Intel Technology India Private Limited	7.50	Tiju Thomas
54	Alloy development for additive manufacturing of prostheses and reconstructive implants	15 October 2020-31 March 2021	Universitetet i Stavanger	2.72	Murugaiyan Amirthalingam, Lakshman Neelakantan, Durga Janaki Ram Gabbita
55	Development of Zr, La, B and C containing single source proceramic polymer for high temperature applications	2 November 2018-30 October 2020	ISRO	36	Ravi Kumar NV
56	Development and characterization of novel materials for capacitor- based energy storage devices	1 June 2017- 30 December 2020	Department of Science & Technology	35.6	Ravi Kumar NV
57	Development of prototype ceria-based water splitter to generate hydrogen using concentrated solar energy	1 November 2016-1 September 2020	Uchhatar Avishkar Yojana - IIT Madras	157	Ranga Rao G (PI), Ravi Kumar NV, Sundararajan T, Somnath Bhattacharyya
58	DST Solar Energy Harnessing Centre - Solar Fuels - Sub Project	1 June 2018-1 June 2021	Department of Science & Technology	230.6	Ranga Rao G (PI), Ravi Kumar NV, Sundararajan T, Tiju Thomas

59	Fabrication of polymer- based materials for thermoelectric applications	1 February 2017-1 March 2021	Impacting Research Innovation and Technology - IMPRINT	329	Dillip Kumar Satapathy (PI), Ravi Kumar NV
60	Engineering weld microstructures against hydrogen embrittlement	1 March 2017-1 March 2020	Department of Science & Technology	85.5	Murugaiyan Amirthalingam (PI), Ravi Kumar NV

### Industrial consultancy projects (ongoing and new)

S.No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
<b>New (IC and Retainer Consultancy)</b>				
1	Balasubramanian M	Consultation for solving the problems of composite brake materials	Sundaram Brake Linings Limited	7.08
2	Sreeram K. Kalpathy, Balasubramanian M	Plastic door part testing	Hanon Automotive Systems India Private Limited	0.59
<b>Ongoing</b>				
1	Srinivasa Rao Bakshi, MM	Characterization and analysis of the materials	Renault Nissan Technology & Business Centre India Private Limited	11.50
2	Somnath Bhattacharyya	TEM investigation of hot ductile, stress relaxed cracked samples of Sanicro 25 and Alloy 617M	Indira Gandhi Centre for Atomic Research	7.25
3	Pradeep K G	Correlative microscopy analysis of 9Cr-1Mo steels	Indian Institute of Technology Kharagpur	15
4	Pradeep K. G.	Correlative microscopy of 617m and 304 steels	Indira Gandhi Centre for Atomic Research	47.90
5	Pradeep K. G.	Correlative microscopic analysis of advanced ceramics and wear-resistant tool materials	Carborundum Universal Limited	15.00
6	Balasubramanian M	Consultation for solving the problems of composite brake materials	Sundaram Brake Linings Limited	7.08
7	Sreeram K. Kalpathy, Balasubramanian M	Plastic door part testing	Hanon Automotive Systems India Private Limited	0.59

S.No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
8	Pradeep K G	National Facility for Atomic Scale Materials Characterization Using Remotely Operable Atom Probe Tomography (NFAPT)	Common Code	35.90
9	Pradeep K G	NFAPT	Common Code	25.00
10	Ravi Sankar K, Ganesh Sundara Raman, Murugaiyan Amirthalingam	Electrical Discharge Machining (EDM)	Common Code	10.00
11	Murugaiyan Amirthalingam, K. C. Hari Kumar	Testing of C-S and gas analysers	Common Code	5.00
12	Murugaiyan Amirthalingam, K. C. Hari Kumar	Testing of C-S and gas analysers	Common Code	5.00
13	Sankaran S	Rolling Mill Facility at MFL	Common Code	15.00
14	Sankaran S	Rolling Mill Facility at MFL	Common Code	15.00
15	Sankaran S, Kanchanamala, Somnath Bhattacharyya	Central Electron Microscopy Facility	Common Code	5.00
16	Sankaran S, Kanchanamala, Somnath Bhattacharyya	Central Electron Microscopy Facility	Common Code	57.20
17	Ravi Kumar N V	Failure analysis of metallurgical components	Common Code	21.2

**RBIC projects (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
<b>New</b>				
1	Parasuraman Swaminathan	Development of transparent touch sensors and antennas for automotive applications	Saint-Gobain India Private Limited (Research & Development)	18.64
2	Pradeep K G	Combinatorial alloy design - Role of B and N on the high temperature stability and mechanical behavior of P91 steel	Indira Gandhi Centre for Atomic Research	44.60
3	Pradeep K G	Designing and development of complex concentrated alloys (CCA) by combinatorial approach and rapid alloy prototyping	Naval Materials Research Laboratory	80.00
4	Hari Kumar K C	Phase transformation study Al based coating on steel	Tata Steel Limited	45.31
<b>Ongoing</b>				
1	Parasuraman Swaminathan	Development of transparent touch sensors and antennas for automotive applications	Saint-Gobain India Private Limited (Research and Development)	18.64
2	Hari Kumar K C	Phase transformation study Al based coating on steel	Tata Steel Limited	45.31

3	Pradeep K G	Designing and development of Complex Concentrated Alloys (CCA) by combinatorial approach and rapid alloy prototyping	Naval Materials Research Laboratory	80.00
4	Pradeep K G	Combinatorial alloy design - Role of B and N on the high temperature stability and mechanical behavior of P91 steel	Indira Gandhi Centre for Atomic Research	44.60
5	Sankaran S, Arockiarajan A	Effect of Dwell time of LCF behaviour of GTM SU-263	Gas Turbine Research Establishment	68.58
6	Ranjit Bauri, Kamaraj M	Wear resistant iron matrix composites for cement and mining industries	FLSmidth Private Limited	16.00
7	Somnath Bhattacharyya	Electron microscopic investigation of steel with various composition and processing conditions	Indira Gandhi Centre for Atomic Research	4.84

#### Retainer consultancy (ongoing and new)

##### New

1	Ranjit Bauri	SG iron casting - performance at sub-zero temperatures	PERI Werk (India) Private Limited	2.36
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##### Ongoing

1	Durga Janaki Ram Gabbita	Metallurgical consultancy for construction of Chhatrapati Shivaji Maharaj Memorial	L&T Construction Limited	29.50
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#### 4.14.6. Other Activities of the Department

Results obtained in research work (from M.S. and Ph.D. thesis) of the scholar/faculty Dr Manoj Settem and Dr Anand Kanjarla employed molecular dynamics simulations to study the structure and stability of nanoalloys. He proposed core-shell energetics as a metric to explain structural transitions. He has identified a novel core shell structures with chiral cores.

Mr Meduri Srinivas and Dr -Ing. Lakshman Neelakantan and Dr A. Srinivas investigated novel routes like melt spinning and cryomilling to process SnCoC anodematerial for Li-ion battery applications. They reported that, anodes prepared by smart combination of melt spinning and ball milling exhibit 30% higher specific capacity, and cryomilling helps in reduction of processing time, modification of the structure, hence enhancement in the electrochemical performance.

Rajesh Jarugula and Prof. G. Sundararajan and Prof. S. Ganesh Sundara Raman investigated hot deformation behaviour of nano oxide dispersion strengthened 18 Cr ferritic steel over a wide range of strain rates and temperatures, quantified individual contribution of

all strengthening mechanisms to yield strength at different temperatures (RT to 1573 K) and concluded that Orowan mechanism is the only strengthening mechanism operating at high temperatures.

Mohammed Rashad K, under the guidance of Prof. M. Balasubramanian, investigated the development of monolithic mullite microfiltration membrane for water purification and reported that it is possible to prepare a low-cost membrane by using hydrated aluminium flouride.

Logesh, under the guidance of Prof. M. Balasubramanian, investigated the properties of carbon fiber reinforced silicon nitride composites prepared by reaction bonding and spark plasma sintering. They concluded that the reaction bonded composites have excellent microwave absorption properties and spark plasma sintered composites are useful for structural as well as EMI shielding applications.

Mr Shantharama and Dr Sreeram K. Kalpathy investigated the role of Marangoni effects generated by surfactants, temperature gradients, and electric fields in films of deformable, flowing matter. They concluded that Marangoni effect can be utilised to



create unique patterns and self-organised structures in films of complex liquids and polymers.

Mr Thota Hemanth, under the guidance of Prof. Subramanya Sarma, optimised strain annealing parameters to achieve a grain boundary engineered (GBE) microstructure in multicomponent CoCrFeMnNi alloy. Study of aqueous corrosion behaviour of GBE and non-GBE microstructures through potentiodynamic polarisation and electrical impedance spectroscopy revealed improved corrosion resistance in GBE condition.

Mr R Jeyaraam, under the guidance of Prof. Subramanya Sarma and Prof. Srikanth Vedantham (ED), studied, through experiments and a phase field model, the development of grain boundary character microstructure during strain annealing. The role of the axis of the grain boundary on the interactions of CSL boundaries in triple junctions was evaluated and probabilities for the outcomes of interactions of CSL boundaries were estimated.

Arun M.S. and Dr Uday Chakkingal investigated the effect of equal channel angular pressing on the workability and high-temperature deformation behaviour of magnesium alloy AZ31 and concluded that this process can improve the high-temperature formability.

Ms Padmalatha T.S.R.V and Uday Chakkingal investigated workability and hot deformation behaviour of a metastable Ti alloy Ti-5Al-5Mo-5V-3Cr and showed that wider hot working range can

be obtained by controlling the microstructure of the alloy.

#### Inter-disciplinary group achievements of the departments

The department faculty members have actively involved with the faculty members of other departments to establish Centre of Excellence (CoEs) under the IoE scheme.

The Principal Investigators from MME are Additive Manufacturing by Dr Murugaiyan Amirthalingam. Surface Engineering by Dr Srinivas Rao Bakshi Ceramic Technologies by Dr N.V. Ravi Kumar Advanced Materials and Microscopy by Dr S. Sankaran Microscopy, Metallurgy and Materials Science, Defect Chemistry and Physics by Dr K.G. Pradeep. Centre for Pyrometallurgy by Dr Ajay Shukla

#### Socially relevant activities carried out by the department

Dr K. C. Hari Kumar, a professor in the department, was a Member, Independent Expert Committee, DRDO Innovation Contest, Dare to Dream 2.0 (<https://www.drdo.gov.in/dare-dream-20>), November 2020. He was also in the Selection Committee for faculty recruitment for IIT Roorkee and IIT Kanpur.

#### Major infrastructure development made in the department

Various research equipment was installed in the department last year to enhance the research capabilities of the department. The equipment is listed in the following table.

### New equipment installed in the department in the year 2020-2021

S. No.	Equipment	Value (Rs. in lakh)
1	Flame spray pyrolysis equipment	110
2	High-temperature muffle furnace (1700 °C)	5
3	High-temperature (1700 °C) tubular furnaces (horizontal and vertical arrangements)	18
4	Hybrid microwave heating furnace with computer control	17
5	Computerised shaping machine	4
6	Jar mill	0.9
7	CO generator	0.9
8	Struers automatic polishing machine	16
9	Chennai Metco manual polishing machine	1
10	Spin coating unit with UV curing HO-TH-05C from Holmarc	1.92
11	Programmable spray coater HO-TH-04C4 from Holmarc	8.17
12	High-speed tabletop cooling centrifuge C-24 plus from REMI	2.23



13	Magnetron sputtering machine (ATS 500)	52
14	Horizontal creep machines fitted with three furnaces (3 nos)	12
15	High-temperature DIC setup for a horizontal creep frame	4
16	Hot mounting machine	0.6
17	Glove box	4.5
18	Viscometer	9.35
19	Micro plasma wire arc additive manufacturing facility	15
20	Planetary ball mill	10
21	Vacuum freeze dryer	9
22	Rotating disc electrode set-up	5
23	HPLC System with RID detector	20.33
24	Electro-spinning unit	4.36
25	UV Visible NIR spectroscope	35



Photograph of the magnetron sputtering unit installed in the department in 2020-2021



After the shifting of the department to New Academic Complex (NAC), the departmental office and HoD's office have undergone a facelift. An interactive touch screen-based display system was installed in the committee room and plans to install similar facility in the seminar room/classroom were in progress.

Photographs (above) showing the infrastructural changes carried out at the department during the year 2020-2021

## 4.15 Department of Ocean Engineering

### 4.15.1 Introduction

The Ministry of Education and Social Welfare, as per the decision of Council of Indian Institute of Technology, established the Ocean Engineering Centre of IIT Madras in 1977 based on the recommendation of the committee headed by Dr Y. Nayudamma. The department is to act as a Centre of Excellence for advancing the frontiers of science and to provide breakthrough technology and develop education and training programmes in the field of

ocean engineering. A national advisory committee consisting of the representatives of the then Ministry of Education and institutions such as Council of Scientific and Industrial Research (CSIR), University Grants Commission (UGC), Department of Science & Technology (DST), Oil and Natural Gas Corporation (ONGC) and Engineers India Limited (EIL), other IITs and user industries with the Director, IIT Madras as the chairman monitored the progress of the department over the years.

### 4.15.2 Academic Programmes

B.Tech and M.Tech (Dual Degree) in Naval Architecture and Ocean Engineering, B.Tech and M.Tech (Dual Degree) in Naval Architecture and Applied Mechanics, M.Tech in Offshore Structures (before Ocean Engineering), M.Tech in Ocean Technology - UoP (MoES), M.Tech in Petroleum Engineering, M.S. and Ph.D in Ocean Engineering (OE) and Petroleum Engineering (PE).

### Students on roll as of September 2020+M.S. and Ph.D admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and Others	Total
B.Tech.	72	57	34	27	7	197
Dual Degree	3	15	20	18	7	63
M.Tech.	43 (OE-27, PE-16)	27 (OE-20, PE-7)	-	-	-	70
M.S.	14	18	8	7	3	50
Ph.D.	11	19	37	26	78	171
<b>Total</b>	<b>143</b>	<b>136</b>	<b>99</b>	<b>78</b>	<b>95</b>	<b>551</b>

### Students/Scholars who attended conferences/seminars/symposia abroad/India

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposia/Workshop	Date and Venue	Financial Assistance from
1	Paramesh S	OE18S005	Global Oceans IEEE Conference (online)	October 2020, Singapore	CPDA of Supervisor
2	Paramesh S	OE18S005	Marine Technology Conference (MARTECH 2020) (online)	November 2020, Lisbon	CPDA of Supervisor
3	Pravallika P	OE19S019	Marine Technology Conference (Martech 2020) (online)	November 2020, Lisbon	CPDA of Supervisor
4	Vijith P P	OE19D019	39th International Conference on Ocean, Offshore and Arctic Engineering, OMAE-2020 (online)	2020, Florida, USA	CPDA of Supervisor
5	Suman Kumar	OE18S002	Experimental and Numerical Analysis of PTO Damping for Point Absorber Wave Energy Converter, International Conference on Advancement in Mechanical Engineering (ICAME 2020)	16-18 January 2020, Kolkata	HTRA

### Students/Scholars who won outside prizes and awards

S. No.	Student/Scholar	Roll No.	Prize	Prize Awarded By
1	Varunan T.	OE14D209	Institute Research Award 2019-20 (July-November)	Indian Institute of Technology Madras
2	Gaurav Pandey	OE13D211	Institute Research Award from IIT Madras (Merit Certificate) for exemplary research done in his Ph.D. Bhagyalakshmi and Krishna Iyengar Award	Indian Institute of Technology Madras

### Students/Scholars who won Institute Convocation/Institute Day Prize

S.No.	Student/Scholar	Roll No.	Prizes	Donor
1	Abdul Rauf N K	NA15B033	Class-NK100 prize winner	Class NK
2	Madhan Kumar P	OE15D027	Institute Research Award 2020	IIT Madras
3	R. Suchithra	OE15D014	Professor Vallam Sundar Prize	IIT Madras
4	Dr Tapas Kumar Das	OE15D016	Institute Research Award 2021	IIT Madras

### 4.15.3. Faculty and Their Specialisations

#### Faculty

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Prof. K. Murali ( <b>Head</b> )	Numerical modelling of coastal hydrodynamics, sediment transport and pollutant transport, CFD modelling for pollutant transport, CFD application to ship and underwater hydrodynamics, coastal and ocean hydrodynamics, hydro-elasticity and fluid structure interaction, multiphase flow simulations, general free-surface flows
Prof. S. K. Bhattacharya (Retd)	Ship and offshore structures, structural dynamics, fluid-structure interaction, finite element method, dynamics of floating bodies, ocean acoustics, controllability of marine vehicles
Prof. S. A. Sannasiraj	Wave-structure interaction, breaking waves, numerical modeling of nonlinear wave propagation
Prof. S. Surendran (Retd)	Ship motion analysis and control, ship structures and alternate materials for ship construction
Prof. P. Krishnankutty	Ocean wave-structure interaction, ship hydrodynamic interactions, ship motions and controllability, biomimetic propulsion for marine vehicles
Prof. S. Nallayarasu	Analysis and design of offshore structures wave structure interaction, hydrodynamic response of spar hulls, damping elements in floating systems

Name and Qualifications	Major Areas of Specialisation
Prof. Srinivasan Chandrasekaran	Nonlinear dynamic analysis of offshore compliant structures, earthquake-resistant analysis and design of structures, modal pushover analysis of framed structures, base isolated structures, semi-active damping devices for response control of structures, seismic analysis of offshore structures, shell structures under shock and impact loads
Prof. P. Shanmugam	Ocean optics and imaging, satellite oceanography, coastal and marine geospatial science and technology
Prof. R. Panneer Selvam	Stochastic modelling and simulation analysis, system identification, nonlinear dynamical fluid structure systems—applications in ocean and wind engineering
Prof. G. Suresh Kumar	Flow through fractured reservoirs, enhanced oil recovery, contaminant hydrogeology
Prof. Palaniswamy Ananthakrishnan	Ship hydrodynamics: resistance and seakeeping biomimetic propulsion and control of marine vehicles finite-difference analysis of nonlinear wave hydrodynamics
Dr Jitendra Sangwai	Enhanced oil recovery, flow assurance, nanotech applications for O&G, gas hydrates in bulk and porous media, rheology of complex fluids, drilling fluids, polymer science, PVT studies
Dr Rajiv Sharma	Design of deep water drilling solutions and floating structures; computer-aided geometric design, computational geometry, visualization, and their applications in design, robotics and manufacturing; dynamic data driven forecasting systems; and participatory/democratic economy
Dr Abdus Samad	Wave energy, turbo machinery, CFD, optimization
Dr Nilanjan Saha	Offshore wind and wave energy, dynamics of offshore structures, extreme value statistics and fatigue, nonlinear methods in ocean engineering, offshore soil-structure interaction, stochastic processes, filtering and identification, renewables, port and harbor structures
<b>Associate Professors</b>	
Dr Rajesh R. Nair	Petroleum: geomechanics, fracturing and recovery process, geostatistics for reservoir modeling and seismic characterization and near surface geophysics including ground-penetrating radar data analysis and seismic refraction
Dr Deepak Kumar	Structural dynamics, random vibration, nonlinear dynamics, stochastic control and stability, time-frequency domain analysis
Dr V. Sriram	Numerical modeling/computational hydrodynamics meshfree methods, hydro-elasticity violent wave-current-structure interactions, experimental wave generation and extreme wave interactions

Name and Qualifications	Major Areas of Specialisation
Dr R. Vijay Kumar	Ship helo interface, green ship initiative, underwater gliders, marine hydrodynamics, warship design, submarine design
<b>Assistant Professors</b>	
Dr Tarun K. Chandrayadula	Signal processing and propagation modeling
Dr Suresh Rajendran	Numerical modelling of fluid-structure interaction, nonlinear ship dynamics and hydrodynamics, hydroelasticity, maneuvering in waves, parametric rolling of ships
Dr Abhilash Sharma (newly joined faculty member)	Ship hydrodynamics
Dr K.G. Vijay (newly joined faculty member)	Coastal structures, oscillating water columns, sloshing, wave structure interaction, boundary element method, nonlinear modelling
Dr K. Narendran Kumar (newly joined faculty member)	VIM of offshore structures, VIV of marine risers and pipelines, hydrodynamic measurements, fluid-structure interaction (FSI), flow control and drag reduction, bluff-body flows, marine renewable energy systems
<b>Emeritus Scientist/Emeritus Professor</b>	
Prof. V. Sundar	Coastal engineering, port and harbour structures, fluid flow problems
Prof. R. Sundaravadivelu	Computer-aided analysis, design and experimental studies of coastal and offshore structures, port and harbour structures

### Short-term courses/workshops/seminars/symposia/conferences organised by the faculty members

S. No	Coordinator(s)	Title	Period
<b>Seminar</b>			
1.	Prof. V. Sundar, Prof. S. A. Sannasiraj, Prof. K. Murali	CMIS training programme	18-22 January 2021
<b>Workshops</b>			
1	Prof. V. Sundar, Prof. S.A. Sannasiraj, Prof. K. Murali	National Workshop on Coastal Management Information System	18-23 January 2021
2	Dr Suresh Rajendran and Antonio Pascoal	Advanced Control and Navigation of Autonomous Marine Vehicles	1-14 August 2019
3	Dr V. Sriram and Shiqiang Yan	2nd International Workshop on Numerical and Experimental Modelling of Wave Structure Interactions (NEMWSI) <a href="http://www.doe.iitm.ac.in/NEMWSI/">http://www.doe.iitm.ac.in/NEMWSI/</a>	17-26 November 2020
<b>Short-term Course</b>			
1	Prof. S. Nallayarasu	Design of Offshore Structures - Module 5	14-19 September 2020

### Short-term courses/workshops/seminars/symposia/conferences/training attended by the faculty members in academic institutions and public sector undertakings

S.No.	Faculty Member	Title	Institution	Period
<b>Workshops</b>				
1.	Prof. V. Sundar	ISSMGE TC 213 Workshop on Scour and Erosion	Indian Geotechnical Society and Andhra University	16 December 2020
2.	Prof. V. Sundar	2nd International Workshop on Numerical and Experimental Modelling of Wave Structure Interactions	IIT Madras	17-20 November 2020
<b>Conferences</b>				
1	V. Sriram	ISOPE	ISOPE Society	11-16 October 2020; online
2	Nilanjan Saha	Multi-hazard Coastal Infrastructure Vulnerability Assessment of Ennore (India) Coastal Region	First International Webinar Series on Natural Disaster Resilience for Built Infrastructure (NDRBI) 2020, University of Sydney	24-28 August 2020
3	Nilanjan Saha	NDT Analysis of Howrah Bridge	Innovative Marine Infrastructure Projects and Rehabilitation Using High Performance Grouts and MCU	26-27 November 2020
4	Nilanjan Saha	Design of Bunds for River Bank Protection	Geo-synthetics for Coastal Protection and Port Works	10-11 December 2020

### Special lectures delivered by the faculty in other institutions

S. No.	Faculty Member	Topic of Lecture	Institution	Date
1	Prof. V. Sundar	First Indo-German webinar on Future Coasts	IIT Madras and RWTH Aachen, Germany	30 June 2020
2		Sustainable hard and soft measures for coastal protection	IIT Gandhinagar	10 August 2020
3		Coastal protection session as presenter and moderator	VAIBHAV, Government of India	7 October 2020
4		Hydrodynamics of an oscillating water column wave energy converter integrated with breakwaters	2nd International Workshop on Numerical and Experimental Modelling of Wave Structure Interactions, IITM	17-20 November 2020
5		Sustainable hard and soft measures for coastal protection	ISSMGE TC 213 workshop on Scour and Erosion organised by Indian Geotechnical Society and Andhra University	16 December 2020
6		Sustainable hard and soft measures for coastal protection	University of Hawaii, USA	20 January 2021



S. No.	Faculty Member	Topic of Lecture	Institution	Date
7	Dr Abdus Samad	FDP on Advances in thermo-fluids and turbomachines	Satyug Darshan Institute of Engineering and Technology, India	6-7 May 2020
8		Short-term training programme on Green energy technologies for sustainable development	NIT Kurukshetra, India	11-20 June 2020
9		Emerging trends in renewable energy generation, monitoring and control	VIT University, Chennai, India	28 August 2020
10		Basic concepts in turbomachinery and its applications	National Institute of Engineering Mysore, India	27 August 2020
11		Recent Advances in Materials and Manufacturing- RAMM-2020	Gayatri Vidya Parishad College of Engineering, Visakhapatnam, India	7 September 2020
12		Clean energy technologies for sustainable growth - current research and development	VIT Vellore, India	14-18 December 2020
13	Prof. S.A. Sannasiraj	Save our beaches, protect our coast	The Times of India Conclave	5-8 June 2020
14		Climate change impacts on coasts	First Indo-German webinar on Future Coast	30 June 2020
15		Coastal erosion and role of geosynthetics	Webinar on Draft guidelines on geosynthetics for coastal protection and port works	10-11 December 2020
16		Developments and challenges in offshore engineering	Webinar: National-level seminar on Ocean Science and Maritime Technology, IIT Delhi	4 January 2021
17		Shore protection along the coast of ecologically sensitive island	NIOT webinar on Shore Protection by Recent and Evolving Techniques (SPREAD) - Assessment and Dissemination	5 February 2021
18	Prof. Jitendra S Sangwai	Interdisciplinary Faculty Development Programme (FDP) on Challenges and Opportunities in Recent Emerging Technologies	Shri Guru Gobind Singhji Institute of Engineering & Technology (an autonomous institute established by the Government of Maharashtra State), Nanded, (MH)	6-10 July 2020
19		TEQIP-III Sponsored online short-term course on Recent Trends in Chemical Engineering and Process Technology (RTCEPT-2020)	Department of Chemical Engineering, National Institute of Technology Srinagar, Jammu and Kashmir 190006, India	12-16 October 2020
20		TEQIP-III Sponsored online short-term course on Recent Trends in Chemical Engineering and Process Technology (RTCEPT-2020)	Department of Chemical Engineering, National Institute of Technology Srinagar, Jammu and Kashmir 190006, India	12-16 October 2020

S. No.	Faculty Member	Topic of Lecture	Institution	Date
21		TEQIP (Technical Education Quality Improvement Programme) online e-short term course on Future Perspectives of Research in Chemical Science and Technology, Dr B. R. Ambedkar National Institute of Technology, Jalandhar	Dr B. R. Ambedkar National Institute of Technology, Jalandhar	20-24 October 2020
22	Prof. Jitendra S Sangwai	AICTE-sponsored STTP on Development of Chemical Engineering Thermodynamics for Undergraduates	GIET University, Gunupur, Odisha	14-19 December 2020
23		Invited talk: ATAL Academy Faculty Development Programme	Dibrugarh University, Assam	25 November 2020
24		Rheology of oilfield system and its implications on the oil and gas recovery from subsurface reservoir, Complex Fluids 2020	IIT Bombay	10-12 December 2020
25		Rheology of oilfield system and its implications on the oil and gas recovery from subsurface reservoir	Indian Institute of Petroleum and Energy, Vishakhapatnam, India	October 2020
26	Prof. Jitendra S Sangwai	Panelist: Vaishwik Bharatiya Vaigyanik (Vaibhav Summit), Advanced Fossil and Nuclear Technologies	NITI Aayog, Government of India	15 October 2020
27	Rajiv Sharma	Smart technologies in marine design and production – design, development, applications and challenges	AICTE-sponsored STTP on Role of Smart Technology In Maritime Industries, AMET University, Chennai, India	6 November 2020
28	Deepak Kumar	Stochastic response analysis of single degree of freedom system using Fokker-Planck equation	JSS Academy of Technical Education, Noida	10 June 2020
29	R Vijayakaumar	Green ship and interaction of flumes with superstructure and effect of helo operations	Indian Naval Academy, Indian Navy	25 August 2020
30		Some case studies on application of smart technologies in ship design	AICTE-sponsored six days online short-term training programme	23-28 November 2020

### Award obtained by faculty

S. No.	Faculty Member	Award	Awarded by	Awarded for	Date of Award
1	Dr V. Sriram	ISOPE Session Organiser of the Year Award	ISOPE Society	Outstanding initiative as organiser of the 30th ISOPE	14 October 2020



## Fellowships of academies and professional societies

S. No.	Faculty Member	Year of Admission
<b>Humboldt Fellowship</b>		
1	Dr V. Sriram	2011
<b>Others: ASEM-DUO India Fellowship</b>		
1	Dr Suresh Rajendran	2020-2021
2	Prof. Nilanjan Saha, Life Member of Indian Society for Earthquake Technology, LM-1779	2021
3	Prof. Nilanjan Saha, Fellow of Indian Society of Hydraulics, LF-1494	2021
4	Prof. Nilanjan Saha, Life Member of Indian Association of Hydrologists, LM-2033	2021
5	Prof. Nilanjan Saha, Fellow of Institution of Engineers India	2020
6	Prof. Nilanjan Saha, Life Member of Indian Geotechnical Society, LM 4226	2017
7	Prof. Nilanjan Saha, American Society of Civil Engineers (Member No. 402999)	2012
8	Prof. Nilanjan Saha, American Society of Mechanical Engineers (Member No. 100133894), Honorary for last four years	2012
9	Prof. P. Krishnankutty, RINA: Vice President (Asia Region) and Council Member, The Royal Institution of Naval Architects (RINA), London	September 2019-present

## Journal Editorial Boards

S. No.	Faculty Member	Position	Journal Name
1	Prof. V. Sundar	Member	<i>Journal of Applied Water Engineering and Research</i>
2		Associate Editor	<i>Journal of Hydro-Environment Research</i> (Elsevier Publishing Co.)
			<i>Ocean Engineering journal</i> (Elsevier Publishing Co.)
3			
4		Member	<i>Institution of Mechanical Engineers, Part M: Journal of Engineering for the Maritime Environment</i>
5	Associate Editor	<i>Indian Society of Hydraulics Journal</i>	
6	Member	Fourth Editorial Board of <i>China Ocean Engineering</i>	
7	Prof. P Shanmugam	Editorial Member	<i>Dataset Papers in Geosciences</i> (Oceanography Section)
8		Editor	<i>International Journal of Geophysics and Remote Sensing</i>
9	Prof. Jitendra S. Sangwai	Journal Editorial Board Member	Editorial Advisory Board of the <i>Journal of Chemical and Engineering Data</i> published by the American Chemical Society, USA

S. No.	Faculty Member	Position	Journal Name
10	Prof. Abdus Samad	Editor	<i>The Journal of Mathematical Problems in Engineering</i>
11			<i>The International Journal of Naval Architecture and Ocean Engineering (IJNAOE)</i>
12	Prof. S A Sannasiraj	Member	Committee of Technical Experts on Sustainable Reconstruction of Sunderban Embankments damaged by the extremely severe cyclonic storm, Amphan, 2020-2021
13			Academic Council, Kamaraj College of Engineering, Virudhunagar, 2020-21
14			Academic Council, Mepco Schlenk Engineering College, Sivakasi, 2019-21
15	Nilanjan Saha	Associate Editor	<i>Journal of Offshore Mechanics and Arctic Engineering</i>
16	Rajiv Sharma	Deputy Editor	<i>Journal of Marine Science and Technology</i> ( <a href="https://www.springer.com/journal/773/">https://www.springer.com/journal/773/</a> )
17		Member	<i>Proceedings of the Institution of Mechanical Engineers, Part M: Journal of Engineering for the Maritime Environment</i> ( <a href="https://journals.sagepub.com/home/pim">https://journals.sagepub.com/home/pim</a> )
18		Member	<i>Advances in Computational Design (ACD)</i> - An international Journal ( <a href="http://www.techno-press.org/?journal=acd#">www.techno-press.org/?journal=acd#</a> )

#### 4.15.4. Design and Development Activities

##### Brief and specific details of process/instruments/equipment/software designed and developed

Design of wavemaker and wave generation software as a product tool, which are provided to NIT Trichy and NIT Surathkal.

##### New facilities added or major equipment procured

S. No.	Equipment	Value (Rs. in lakh)
1	Inverted microscope (Prof. Jitendra S. Sangwai)	25
2	Self-propelled ship model (Dr Suresh Rajendran)	20
3	Lidar	7
4	Acoustic Doppler Velocimetry	7
5	Torpedo anchor testing facility (Prof. Nilanjan Saha)	2.5

#### Patents

##### Patents awarded

S. No.	Faculty Member	Topic of Patent
1	Dr Rajesh R Nair	Patent No.342119 titled, Analyzing geomechanical observations of a reservoir
2	Dr Rajesh R Nair	Patent No.349691 titled, Method for industrial gas hydrate production

#### 4.15.5. Research and Consultancy

##### Sponsored research projects (ongoing and new)

S. No.	Title	Period	Funding Agency	Amount (Rs. In lakh)	Coordinators
1	Assessment tool for assessing the impact of ship/boat wake waves on the banks and protection measures for inland waterways	March 2018-March 2021	Ministry of Shipping	69.51	Prof. K. Murali and Prof. V. Sriram
2	Inlet dynamics and shoal process—a complete numerical, laboratory and field study	March 2018-March 2021	Ministry of Shipping	63.51	Prof. K. Murali
3	New concepts of pile supported breakwater with berthing facility	March 2018-March 2021	Ministry of Shipping	59.11	Prof. S. A. Sannasiraj
4	Potential impact of climate change on extreme waves and wave induced sediment transport coastal erosion siltation and shoreline shifts, DST	March 2018-March 2023	DST	34.46	Prof. S. A. Sannasiraj
5	Prediction of coastal morphological changes due to climate change variation of sea level rise, DST	March 2018-March 2023	DST	34.46	Prof. S A Sannasiraj
6	Effects and adaptation for sea level rise on major coastal infrastructure in India, DST	March 2018-March 2023	DST	95.96	Prof. K. Murali, Prof. S.A. Sannasiraj, Prof. R. Sundraravadivelu
7	The feasibility of estimating marine bioluminescence and detecting submerged vessels from remote sensing data	2021-2023	Indian Navy	193.64	Prof. P. Shanmugam
8	Development of particulate organic carbon (POC) algorithm in the water of Bay of Bengal and Arabian Sea	2020-2021	Space Application Centre	22	Prof. P. Shanmugam
9	Estimation of heat content and its variability depending on the determining factors in the Arctic seas from multi-mission satellite and in-situ observation data	2020-2022	Indo-Russian project	39	Prof. P. Shanmugam
10	Subsidence studies using SAR interferometry	2018-2025	ONGC	153	Prof. R. Sundaravadivelu, Prof. P. Shanmugam
11	National Geospatial Professorship	2018-2022	DST	41	Prof. P. Shanmugam
12	Seismotectonics of Kakinda plant	2020-2021	East Coast Concessions Private Limited	20	Dr Rajesh R. Nair

S. No.	Title	Period	Funding Agency	Amount (Rs. In lakh)	Coordinators
13	Seismotectonics of Kakinada LNG site	2020-2021	Bengal Concessions Private Limited	20	Dr Rajesh R. Nair
14	High-energy fracking device for focused shock wave generation for oil and gas recovery applications	2020-2024	Techno Industrial Marketing	30	Dr Rajesh R. Nair
15	Development of numerical and experimental model for unified seakeeping and manoeuvring of ships in seaway	2019-2022	SERB	35.283	Dr Suresh Rajendran
16	Development of numerical methods for calculation of hydroelastic responses of ships in extreme sea conditions	2019-2022	Naval Research Board	36.18	Dr Suresh Rajendran
17	Advanced ship manoeuvring prediction based on machine learning and artificial intelligence for autonomous ship navigation	2019-2021	Scheme for Promotion of Academic and Research Collaboration (SPARC)	43.14	Dr Suresh Rajendran, Dr Ranjith Mohan
18	Development of a numerical and experimental model for manoeuvring of ships in adverse weather conditions	2019-2021	New Faculty Seed Grant	24.3	Dr Suresh Rajendran
19	Development of guidance and control systems for sea going autonomous surface vehicles (ASV)	2019-2021	SPARC	40.13	Dr Suresh Rajendran, Dr Ranjith Mohan
20	Vortex induced vibration of slender cylindrical structures and cables under wave and current	23 November 2016-22 October 2021	Naval Research Board	63.96	Prof. S. Nallayarasu and Prof. S.K. Bhattacharyya
21	Experimental and numerical modelling of wave-vegetation-structure interactions (EMOD-WVSIInt)	2021	SPARC	53.18	Prof. K. Murali
22	Ecosystem-based solution as a coastal defense structure for coastal smart cities	2023	DST	63.08	Prof. K. Murali
23	Assessment tool for assessing the impact of ship/boat wake waves on the banks and protection Measures for inland waterways	2021	MOSH	69.52	Prof. K. Murali

S. No.	Title	Period	Funding Agency	Amount (Rs. In lakh)	Coordinators
24	Improved design perspective for violent wave impacts during extreme natural disaster events (IDWavImp)	2021	DST	43.27	Prof. K. Murali
25	Development of a strategy for optimal power production from 100 kW class horizontal axis tidal turbines	2018-2021 (Ongoing)	DST-KNRF	32 (from DST)	Prof. Abdus Samad Prof. Shin-Hyung Rhee Co-PI: Nithya Venkatesan
26	Optimization of wave energy system - a primitive model for Indian coastal lines	2019-2021 (Ongoing)	DST/DAAD	6.64	Prof. Abdus Samad Dominique Thevenin
27	Powering defense surveillance system by ocean waves	2019-2020 (Ongoing)	IIT Madras	2	Prof Abdus Samad
28	A new motor-pump coupling for a progressive cavity pump	2019-2020 (Ongoing)	IIT Madras	2	Prof. Abdus Samad
29	Experimental investigations and parametric optimization of spherical helical free flow hydro-kinetic water turbines using towing tank tests	2019-2022 (Ongoing)	DST-TARE	10.05	Prof. Abdus Samad
30	Novel air filter to suppress viral load in confined space; funding body: Royal Academy of Engineering	2020-2021 (Ongoing)	Royal Academy of Engineering, UK	6.05	PI/Co-PI: Eldad Avital, Nithya Venkatesan, Clive Beggs, Prof. Abdus Samad
31	Support for Sustaining Research (SSR)	2020-2021 (Ongoing)	IIT Madras	4	Prof Abdus Samad
32	Design and optimization of jet impingement arrangement on solar air heaters for drying of dates	2019-2022 (Ongoing)	DST-TARE	10	Prof. Abdus Samad
33	Design and development of retrofit solution for fruits and vegetable vending cart	2021-2022 (New)	DST	13.50	PI: Abhijit Deshpande, CoPI: Prof Abdus Samad, R Venkatrathnam, Prof Rajiv Sharma
34	Disinfecting indoor air against diseases such as COVID-19 and TB in cities in the Indian subcontinent	2021-2023 (New)	Royal Academy of Engineering, UK	40	PI: Prof. Abdus Samad, Eldad Avital, Nithya Venkatesan, Himanshu Agarwal
35	Development of guidance and control systems for sea going autonomous surface vehicles (ASV)	15 March 2019-14 September 2021	SPARC-Ministry of Education	40.13	Dr Suresh Rajendran

S. No.	Title	Period	Funding Agency	Amount (Rs. In lakh)	Coordinators
36	Investigations on functional performance of coastal structures through numerical modeling	2021 (ongoing)	Ministry of Earth Sciences (ICMAM)-NIOT	59	Prof. K. Murali
37	National Technology Centre for Ports, Waterways and Coasts (NTPWC)	2021 (ongoing)	Ministry of Shipping	7000	Prof. K. Murali
38	Comprehensive study of the maintenance dredging requirements of all major ports and national waterways	2021 (ongoing)	Ministry of Shipping	167	Prof. K. Murali
39	Development of a customizable 3D numerical hydrodynamics and siltation tool	2021 (ongoing)	Ministry of Shipping	63	Prof. K. Murali
40	Coastal inundation mapping due to extreme events in view of climate change scenarios	2021 (ongoing)	Department of Science & Technology	35	Prof. K. Murali
41	Effects and adaptation for sea-level rise on major coastal infrastructure in India	2021 (ongoing)	Department of Science & Technology	95	Prof. K. Murali
42	Modeling of the tide induced and general circulation and sediment motion of estimation of sediment concentration in water column	2021 (ongoing)	Naval Research Board	62.5	Prof. K. Murali
43	Shelf sea and shelf break processes of the Antarctic margins and the production of dense shelf water	2021 (ongoing)	National Centre for Polar and Ocean Research	24	Prof. K. Murali
44	SMART Maritime Technology	2021 (ongoing)	Ministry of Human Resource and Development	277	Prof. K. Murali
45	Development of smoothed particle hydrodynamics (SPH) capability for naval applications	February 2018-March 2021	Naval Research Board (NRB)	24.06	Prof. Nilanjan Saha
46	Development of hazard and risk maps along east coast on India for coastal flooding due to sea level rise	March 2018-March 2023	DST	34.71	Prof S.A. Sannasiraj
47	Hydro-acoustic performance marine propeller in non-cavitating regime	Two years (December 2018-December 2020)	NRB	30.06	Dr R. Vijayakumar

S. No.	Title	Period	Funding Agency	Amount (Rs. In lakh)	Coordinators
48	Study of airwake and its control over flight deck of aircraft carrier for safe aircraft landing operations	Two years (December 2019-December 2021)	NRB	11.28	Dr R. Vijayakumar
49	Technology development and demonstration of microbubble drag reduction (MBDR) and maneuvering of vessels in Inland water transport (OEC/18-19/157/MOSH/RVIJ)	Three years (12 March 2018-2021)	Ministry of Shipping	100.32	PI: Dr R. Vijayakumar
50	Development of bio-mimetic autonomous underwater vehicles (BAUV) for maritime surveillance (Phase I)	January 2020-December 2023	NRB	201.72	P. Krishnankutty, T. Asokan, R. Vijayakumar, Suresh Rajendran
51	Controllability of ships in harbour and navigational channels	March 2018-March 2021	Ministry of Surface Transport	90.912	P. Krishnankutty
52	Towards Excellence in Engineering Curricula for Dual Education (TEEDE), 2017-2021 (ongoing), Erasmus Plus funded	2017-2021 (ongoing)	Erasmus Plus Funded,	54	Dr Rajesh R. Nair

### Industrial consultancy projects (ongoing and new)

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Prof. V. Sundar	Engineering, design and documentation of erosion control with coastal protection of ROP facilities at Hasik	Habog Consultants Private Limited	6.80
2		Comprehensive development of Muzhupilangad and Dharmadam beach in Kannur district—coastal protection work	Kerala Irrigation Infrastructure Development Corporation Limited	17
3		Construction of groyne fields in the severe erosion prone areas in Ambalapuzha, Kattoor, Nllanikkal North of Vattachal and Ottamassery north of Cherthala in Alappuzha district	Kerala Irrigation Infrastructure Development Corporation Limited	34
4		TANGEDCO-ETPS Expansion Project (1x 660MW Supercritical) - conducting bathymetric study and sediment sampling of locations at Ennore creek and Buckingham canal	Tamil Nadu Generation and Distribution Corporation Limited	3

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
5	Prof. V. Sundar	Technical study on GRW system of protection of walkway and flexi geotextile tubes as submerged groins for beach reclamation	Department of Tourism	23
6		Construction of new fish landing centres at Neerody, Marthandamthurai and Vallavilai in Kanyakumari district	Fishing Harbour Project Division	45
7		Re-visiting the design of coastal protection work at Odalarevu by IIT Madras	Oil and Natural Gas Corporation Limited	22
8		Tranquillity study, detailed engineering design of breakwaters and berthing structure	RITES Limited	26
9		Annual maintenance, support and management of web-enabled GIS-based integrated land management system for Paradip Port Trust	Paradip Port Trust	61.20
10		Construction of groyne at Alanthalai village in Thoothukudi district	Public Works Department	17.50
11		Monitoring of maintenance dredging at outer channel and inner harbour area and bathymetry surveys at channels of Cochin Port	Cochin Port Trust	246.24
12		Detailed engineering for construction of common user manifold and project management consultancy for its implementation	Jawaharlal Nehru Port Trust	77.90
13	V. Sriram	Wave generation software supply	Samudra	22
14		Wave generation software supply		20
15	Prof. Nilanjan Saha, Prof. R Sundaravadivelu	Repair of a slope failure at Hazira	Garware Ropes	10
16		Repair/rehabilitation of bowstring girder bridge on IBP road including estimation in Western Sector Area	Vizag Port Trust	9
17		Repairing of concrete structure of lead-in-jetty at Lock Entrance, Haldia, HDC (Phase-II)		
18		Geotechnical study of breakwater		15
19		Review of structural stability and adequacy of berth nos 2,4,6,8,10 and 12 including quay walls and fenders at Kidderpore Dock West-I		15
20		HDC Protection Dolphin		5
21	Fire-fighting Haldia		99.6	



S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
22	Prof. Nilanjan Saha, Prof. R Sundaravadivelu	Repairing and retrofitting of marine infrastructures - Dry Dock 1, Building berth-1 at GRSE Main, Naval Jetty and Finger Jetty at GRSE-FOJ and Dry Dock 2 at GRSE-FOJ		37.8
23		Retrofitting of Crab Crane Pedestal at HFTPL, Haldia Dock Complex		12.75
24		Fendering system for Berthing area at Andaman-Lakshadweep Harbour Works		9
25		Retrofitting of grab crane foundation in loading platform at HFTPL		5
26		Repairing and painting of concrete structure and steel structures of HOJ-I, HOJ-II and Barge jetty 1 and 2, Haldia, HDC		48.6
27		Repairing of concrete structure of lead-in-jetty at Lock Entrance, Haldia, HDC (Phase-II)		26.08089
28		Civil construction of outer terminal II (jetty structures including Escape Route) at Haldia		121
29		Design of concrete slipway with hoisting winch and working platform for FIC at ND Minicoy		40
30		Design of railway embankment along coastal line between Rameswaram and Dhanuskodi		100
31		Through structural check-up of Brace Bridge		10.62
32		Through structural checkup of Brabourne Road Flyover		15.00
33		Recommendation of structural health checkup at Howrah Bridge using NDT methods		30
34		Upgradation of Berth No.7 NSD, KoPT Kolkata		70.8
35		Establishment of captive coal jetty with unloading facilities and pipe conveyor system for 1x660MW Udangudi Supercritical Thermal Power Project – engaging engineering consultant services for post-contract service		216.4
36		Prof Nilanjan Saha, Prof R. Sundaravadivelu	Fire-fighting design work	
37	Prof Nilanjan Saha, Prof R. Sundaravadivelu	Providing technical services lock system of Haldia		6

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
38	Prof. Sannasiraj S A, Prof. Murali K (Co-PI), Prof. Sundar V (Co-PI)	Project Management (PMC) services for development of Greenfield Port at Machilipatnam in Andhra Pradesh and Detailed Project Report (DPR) for development of a greenfield port at Bhavanapadu in Andhra Pradesh	Rites Limited	95
39	Prof. Sannasiraj S A, Prof. Murali K (Co-PI)	Health audit of main slipway in the Timber Pond, Chennai Port	Coast Guard Region (East)	29
40	Prof. Sundaravadivelu R, Prof. Sannasiraj S A (Co-PI), Prof. Murali K (Co-PI)	IE Oil Jetty Kandla	Deendayal Port Trust	130
41	Prof. Sannasiraj S A, Prof. Murali K (Co-PI)	Technical audit of structures at oil jetties 26B, 27B, allied buildings, structures and technical study to suggest temporary remedial measures for repairs and rehabilitation for the JD entrance walls at Chennai Port	Chennai Port Trust	27.36
42	Prof. Sannasiraj S A, Prof. Murali K (Co-PI), Prof. Sundar V (Co-PI)	Annual maintenance, support and management of web-enabled GIS-based integrated land management system for Paradip Port Trust	Paradip Port Trust	61.2
43	Prof. Sannasiraj S A, Prof. Murali K (Co-PI), Prof. Sundar V (Co-PI)	Monitoring of maintenance dredging at outer channel and inner harbour area and bathymetry surveys at channels of Cochin Port	Cochin Port Trust	246.24
44	Prof. Murali K	Carrying out design for development of Berth No. 17 for handling dry bulk cargo at New Mangalore port (NTPWC)	New Mangalore Port Trust	16
45		Channel assessment studies for Liquid Terminal project at Shalukkali, Haldia (NTPWC)	Hooghly Oil and Gas Terminal Private Limited	15
46		Third-party survey agency for calculation and certification of dredge quantities for maintenance dredging at JNPT for the year 2020-21 (NTPWC)	Jawaharlal Nehru Port Trust	9
47		TPSA for monitoring maintenance dredging works at JNPT for the year 2020-21 (NTPWC)	Jawaharlal Nehru Port Trust	24.8
48		Bathymetry survey and quantity calculation report for dredging work at Chinnamuttom Fishing Harbour, Kanyakumari	Safeway Dredging Enterprises	6

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
49	Prof. Murali K	Preparation of DPR for floating jetties at 50 identified sites (NTPWC)	Department of Shipping Ministry of Shipping Road Transport and Highways	200
50		Preparation of environmental impact assessment (EIA) report - Kovalam Basin M3 - GCC	Corporation of Chennai Storm Water Drainage Department	45
51		Study on handling chemicals and edible oil in the dock basin of CB3/CB4 (NTPWC)	Kamarajar Port Limited	5
52		Study on reuse of dredged material at Kamarajar Port Limited (NTPWC)	Kamarajar Port Limited	13.44
53		Ministry of Shipping	Common Project	10
54		Maintenance dredging – Reconciliation of the siltation observed after phase II (NTPWC)	Jawaharlal Nehru Port Trust	28.75
55		Design and CFD and physical studies to mitigate air entrainment problems in the outfall pipeline of RSPL	RSPL Limited	16.4
56		Study on the reuse of dredged material at Chennai Port (NTPWC)	Chennai Port Trust	13.44
57		Consultancy work related to the dredging in creek channel of Muriganga River (NTPWC)	Dredging Corporation of India Limited	18
58		Study on impact analysis of developments on overall health of the river/navigable depth in the shipping channel of HDC (NTPWC)	Syama Prasad Mookerjee Port, Kolkata	136.1
59		Third-party survey agency – Bathymetry survey witnessing and dredge quantity estimation and certification for the dredging season 2020-21 at JNPT (NTPWC)	Jawaharlal Nehru Port Trust	12.5
60		Technical consultant for carrying out bathymetry and shoreline survey at KPL (NTPWC)	Kamarajar Port Limited	15.85
61		Maintenance dredging at Mormugao Port for the year 2020 - third-party survey (NTPWC)	Mormugao Port Trust	40
62		Third-party survey agency for measurement of dredged quantity in the work of dredging in entrance channel and harbour mouth of Puducherry Port (NTPWC)	Port Department	26.5308
63	Recirculation study for Indo-Bangladesh 2X660 MW Maitree Super Thermal Power Project, Rampal	Bharat Heavy Electricals Limited	13.9	

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
64	Prof. Murali K	Extended monitoring study of shipping channel leading to HDC and updated numerical model study for removal of lock at HDC/alternate option for Haldia Dock (Phase IV) (NCPWC)	Kolkata Port Trust	232.8
65		Independent quality inspection for works of MMT Haldia, Varanasi and Sahibganj and New Navigational Lock at Farakka (NCPWC)	Inland Waterways Authority of India	16
66		Appointment of Technical Advisor for revamping and up-gradation of fire-fighting system and associated facilities at oil jetties (NCPWC)	Deendayal Port Trust	40.1386
67		Witnessing pre, post and monthly survey during maintenance dredging at PPT (NCPWC)	Paradip Port Trust	7.5
68		Monitoring of maintenance dredging at Mumbai Harbour channel and JN Port Channel (NCPWC)	Jawaharlal Nehru Port Trust	66
69		3D Full bridge real-time ship navigation simulation study for verifying the berth maneuvering concerns at IOCL captive jetty at Kamarajar Port (NCPWC)	Kamarajar Port Limited	21.3
70		Replacement and revamping of pipeline network at Oil Jetty Area, Kandla (NCPWC)	Deendayal Port Trust	216
71		Optimisation studies of seawater intake and outfall of proposed advanced Heavy Water Reactor Plant at Tarapur	Bhabha Atomic Research Centre	24
72		Detailed engineering for construction of common user manifold and project management consultancy for its implementation (NCPWC)	Jawaharlal Nehru Port Trust	77.9
73		Arbitration dredging	V O Chidambaranar Port Trust	17.8
74		Witnessing and certification of charts and quantities for the project of deepening of navigational areas of channel for coastal berth at JNPT	Jawaharlal Nehru Port Trust	7
75		Feasibility of accepting vessels with larger draft of up to 18m at ICTT Cochin	India Gateway Terminal Private Limited	164.55
76	Bore hole investigation for preparation of detailed project report for revised capital dredging	V. O. Chidambaranar Port Trust	273.76	
77	Monitoring of maintenance dredging at Fourth Container Terminal navigational area of JNPT	Jawaharlal Nehru Port Trust	38.055	

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
78	P. Krishnankutty and Deepak Kumar	Design review of Barge Mounted Tower System	L&T Limited	35
79	Sundaravadevelu R, Nilanjan Saha and Deepak Kumar	Recommendation of structural health checkup at Howrah Bridge using NDT methods	Kolkata Port Trust	41.3
80	P. Krishnankutty, R. Vijayakumar, T. Asokan	Hydrostatic and hydrodynamic analysis of manned submersible	NIOT	212.49
81	P. Krishnankutty, T. Asokan	Mathematical and physical modeling for a vessel maneuvering	L&T	135.70
82	Prof. S. Nallayarasu	Project management consultancy for RO-RO facility at JNPT	Jawaharlal Nehru Port Trust	58
83		Project management services for construction of seawall for Gharapuri Island and Panje Village and boat landing jetty at Nhava end corporate environmental responsibility	Jawaharlal Nehru Port Trust	70
84		Assistance during arbitration for reclamation works at GSPC Mundra LNG Terminal	GSPC LNG Limited	20
85		Pre-bid engineering for the onshore 20" effluent dispersion pipeline project in Dahej - alternate design	Indczech Engineering Private Limited	6
86		Review/Proof Checking/ Scrutiny of detailed design and detailed engineering for development of Vadhavan Port	Jawaharlal Nehru Port Trust	96
87		Project management consultancy services for BPCL jetty repairs at JNPT	Jawaharlal Nehru Port Trust	63
88		Techno-economic assessment of relocation of RO-RO berth at Dahej	Deendayal Port Trust (Kandla Port Trust)	29.70
89		Proof checking for reconstruction of North Jetty at Naval Base, Kochi on EPC mode	Afcons Infrastructure Limited	96
90		Local adequacy check of main deck for spotting of well intervention equipment for LA, LB and GA Platform	Petro6 Engineering & Construction Private Limited	5
91		Feasibility study for deck extension and installation of gas lift compressor at LA platform	Petro6 Engineering & Construction Private Limited	4.68
92		Detailed engineering for RO-RO facility at JNPT	Jawaharlal Nehru Port Trust	35
93		Consultancy services for design of offshore structures and allied special areas	Oil and Natural Gas Corporation Limited	74.62

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
94	Prof. S. Nallayarasu	Detailed survey, assessment and engineering for salvaging of debris of failed cranes and repair of the damaged berth at JNPCT	Jawaharlal Nehru Port Trust	55
95		Feasibility study for seawater intake at Karaikal Marine Terminal	Chemplast Sanmar Limited	3.5
96		Consultancy services towards review, vetting and endorsement of alternate design of North and South breakwater and other construction aspects for Varsha Project	Navayuga Engineering Limited	15
97		Review of loadout engineering for three jackets (one horizontal + two vertical) for 28 Jacket Project	L&T Hydrocarbon Engineering Limited	2.5
98		Pile adequacy check for ILJU - Spudcan Effects for RE, RF and RH Jacket	Petro6 Engineering & Construction Private Limited	12.14
99		Detailed engineering for coastal protection works at landing jetty approach area	Jawaharlal Nehru Port Trust	5
100		Independent structural verification of LA, LB and GA Platform adequacy for new modular crane	Petro6 Engineering & Construction Private Limited	13.41
101		Structural failure analysis of 70T ELL crane at Hindustan Shipyard Limited, Visakhapatnam	Hindustan Shipyard Limited	7
102		Feasibility study of Kandla Jetty for erection of MLA	Aegis Logistics Limited	10
103		Consultancy services for alternate design of NQL platform topsides of ONGC's new LQ and revamp	L&T Hydrocarbon Engineering Limited	8
104		Assessment of D30-2 jacket leg damaged during installation for in-service condition for Cluster-8 Marginal Fields Project of ONGC	L&T Hydrocarbon Engineering Limited	15
105		Pre-bid engineering for Mozambique LNG E-house project	L&T Hydrocarbon Engineering Limited	10
106		Feasibility study for additional well slot in RF (3 nos.), RH (2 nos.) and RB (2 nos.) platform project	Petro6 Engineering & Construction Private Limited	17.33
107		Pre-bid FEED verification for GOP offshore structures and water intake pipelines - Package 2	Archirodon Construction (overseas) Company Limited	27
108	Preparation of FEED and tender documents for 1 No Wellhead PF - D12, 1 Nos Pipelines (D12 to 192-5 locations)	Petro6 Engineering & Construction Private Limited	19.55	

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
108	Prof. S. Nallayarasu	Consultancy services towards construction of Breakwaters, Project Varcha at Rambilli, Visakhapatnam	Navayuga Engineering Limited	35
109		Preparation of DPR for upgradation/ improvement of water supply system, sewage system, storm water drainage system and rainwater harvesting of JNPT Township	Jawaharlal Nehru Port Trust	135
110		Detailed engineering for Third Chemical Berth at Pir Pau	Mumbai Port Trust	50
111		Assessment and design of Fender replacement for JD-4	Mumbai Port Trust	5
112		Consultancy services for estimation of tonnage for Ratna Process Platform	Oil and Natural Gas Corporation Limited	20
113		Alternate design based on mono pile for STS Jetty in Johor - Berth 1 and 2	Sapura Fabrication Sdn Bhd	14.14
114		Detailed engineering for deck extension	Petro6 Engineering & Construction Private Limited	8.6
115		Consultancy services for estimation of tonnage for NLRNC Project	Oil and Natural Gas Corporation Limited	20
116		Verification of pipeline design for HDD crossing under railway crossing for ETBPNMTPL R-LNG Pipeline Project	IndianOil Corporation Limited	45
117		Design proof consultancy for of providing separate approach for cargo movement in Swaraj Dweep Jetty in Andaman and Nicobar Island	Andaman and Lakshadweep Harbour Works	25
118		Detailed engineering for deck extension for installation of three additional well slots at LA and LB platforms	Petro6 Engineering & Construction Private Limited	20.9
119		Engineering services for structural design review and re-analysis for KG-DWN-98/2 Project	Sapura Fabrication Sdn Bhd	231
120		Preparation of conceptual study - artificial lift for LB platform	Petro6 Engineering & Construction Private Limited	6
121		Infrastructure up-gradation work of existing Ballard Pier Berths (BPS and BPX) for cruise ships and other cargo ships	Mumbai Port Trust	31
122	Review of design for jetty extension	Ministry of Shipping	45.8	

**RBIC projects (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Prof. V. Sundar	Implementation of Coastal Management Information System (CMIS) in the states of Tamil Nadu, Kerala and UT of Puducherry	Central Water Commission	351.10
2	Prof. V. Sundar	Formation of Geophysical Information System (GIS) cell in the Tamil Nadu Disaster Management Agency	Disaster Management	151.44
3	Prof Nilanjan Saha	Study of erosion along Posonallah Guide Bund	Dibang Infra Projects Private Limited	23.53
4	Prof. Murali K	Development of the technical, organisational and functional architecture for River Information Services (RIS) on river Brahmaputra (NCPWC)	Assam Inland Water Transport Development Society (AIWTDS)	5
5		Assessment and implementation of night navigation system for cross-river ferry service on river Brahmaputra under AIWTDS Project (NCPWC)	AIWTDS	344.64
6		Supply, deployment and commissioning of civil structures, including platform and mooring components for installation of Automated Tide Gauge (ATG) in river Hugli (NCPWC)	Syama Prasad Mookerjee Port, Kolkata	629.5
7		Supply, installation, telemetry integration and commission of Automated Tide Gauge (ATG) system in River Hugli and its estuary (NCPWC)	Kolkata Port Trust	1009.52
8		Formation of geophysical information system (GIS) cell in the Tamil Nadu Disaster Management Agency	Disaster Management	151.44
9	Prof. S. Nallayarasu	Development of SIMS for offshore platforms of ONGC	Oil and Natural Gas Corporation Ltd	221
10		Hydrodynamic co-efficient of Vertwind	Technip India Limited	15.14

**RBIC projects (ongoing and new)**

S.No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Prof Nilanjan Saha	Visit for construction of Outer Terminal - II at Haldia Dock complex	Ministry of Shipping	25.07
2	Prof Nilanjan Saha	Providing advice for project execution under KoPT	Ministry of Shipping	3.42



### Exchange programme with other universities, including institutions/universities under MoU

1. Dr Suresh Rajendran - SPARC - UCL and City, University of London.
  2. Tapas Kumar Das, OE15D016, Ph.D. scholar (Guide: Prof. Abdus Samad)
- Exchange programme with Otto von Guericke University, Magdeburg, Germany under DST-DAAD project No. OE1920424DSTX008455, from 15 March-15 June 2020

### Faculty members' participation with other institution under MoU

S. No.	Faculty Member	Participation Details	University/Institution
1	Dr V. Sriram	Initiated and coordinated	Swansea University

### 4.15.6. Other Activities of the Department

Dr R. Sundaravadivelu organised a two-day webinar on Innovative Marine Infrastructure Projects and Rehabilitation using Higher Performance Grouts and MCU on 3-4 December 2020.

Webinar Day 1 Topic - Innovative Marine Infrastructure Projects

Webinar Day 2 Topic - Rehabilitation Using High-Performance Grouts and MCU

Topic	Presented by
1. Floating jetty for inland water transport at Goa Fishing Harbour at Karnataka and berth for sea plane at Andaman 2. Repair and protection of lead-in jetty at Halida Dock Complex	Prof. R. Sundaravadivelu, IITM
NDT and vibration studies on Howrah Bridge	Prof. Nilanjan Saha, IITM

Dr R. Sundaravadivelu organised a webinar on Draft Guidelines on Geosynthetics for Coastal Protection and Port Works on 10-11 December 2020.

Topic	Presented by
Geosynthetics Part 2 of IS 4651 and sea wall at Pentha	Prof. R. Sundaravadivelu, IITM
Coastal erosion and role of geosynthetics	Prof. S. A. Sannasiraj, IITM
Design of bunds for river bank protection	Prof. Nilanjan Saha, IITM

### Prof. S.A. Sannasiraj, Expert Committee Member, in other organisations

1. Member, Committee of Technical Experts on Sustainable Reconstruction of Sunderban Embankments damaged by the extremely severe cyclonic storm Amphan, 2020-2021.
2. Member of Academic Council, Kamaraj College of Engineering, Virudhunagar, 2020-21.
3. Member of Academic Council, Mepco Schlenk Engineering College, Sivakasi, 2019-21.

### Dr Rajesh R. Nair

About the Erasmus project TEED: The Erasmus project, TEED (Towards Excellence in Engineering Curricula for Dual Education) aims at upgrading/developing curricula in engineering trade by introducing industrial component through an agreement (memorandum of understanding

between the academia and industry). Unlike a dual degree programme, the dual education introduces the industrial component to the curricula in engineering trade instead of an internship, thereby modernising the existing system of professional development by way of shouldering higher responsibility and challenging problems by way of work at the level of Junior Engineer level leading to a possible faster career growth. The project aims to promote the modernisation, expand the availability and develop the internationalisation of higher education in the partner countries; promote intercultural and interpersonal exchange, the voluntary convergence with the tendencies of the development of higher education in the EU. Prof. Rajesh R Nair, Department of Ocean Engineering, is the programme leader at IIT Madras for this new initiative.

**The MoUs under the TEEDE project are:**

- ❖ MoU between IITM and Hindustan Oil Exploration Company Limited
- ❖ MoU between IITM and Robert Bosch Engineering and Business Solutions Private Limited
- ❖ MoU between IITM and MagGenome Technologies Private Limited
- ❖ MoU between IITM and Claritrics India Private Limited

**Prof. Abdus Samad**

A 196 mm diameter ring type axial flow impulse turbine was developed and coupled with a generator. The turbine was tested for its performance under steady and unsteady flow conditions. It was able to harvest power up to 200 watts. The design and simulation of the 0.3 m bi-directional turbine was with and without fillet shape. The objective of the study was to reduce the secondary flow losses occurring inside passage of turbine to enhance its efficiency by varying the fillet sizes on rotor as well on guide vane. It was found that the fillet shape on guide vane improved performance by 14%.

**Interdisciplinary group achievements of the department**

Dr Abhijit Chaudhury of Applied Mechanics and Prof Abdus Samad jointly working on wave energy based desal project.

**Socially relevant activities carried out by the department**

- ❖ Vending cart design with Chemical Engineering department
- ❖ Mr. Murali (Ph.D. student) was a part of e-Mentoring program for educating Perumbakkam Government Higher school students during Jan-may 2021.

**International collaborations of the department**

- ❖ Indo-Korean Project going on for tidal turbine (DST-KNRF project)
- ❖ Indo-German project going on for wave energy and optimisation project (DST-DAAD Project)
- ❖ Royal Academy of Engineers-UK for Disinfecting indoor air.
- ❖ Queen Mary University London for novel air filter to suppress viral load in confined space.
- ❖ India-USA-Sweden joint desalination by wave energy project (DOE-USA project)

**Student visit**

S.No	Student	Purpose of Visit	Date and Venue
1	R. Ravindar (Guide - Dr V Sriram)	SPARC project	October 2019-June 2020, UCL London
2	Tapas Kumar Das (Guide - Prof. Abdus Samad)	Research exchange program under DST-DAAD project	15 March-15 June 2020, Otto von Guericke Universitat, Magdeburg, Germany

**Activities initiated**

- ❖ Designing a new air filter to disinfect COVID, TB and influenza pathogens.
- ❖ Designing a vending cart for street vendors.

## 4.16. Department of Physics

### 4.16.1. Introduction

Established in 1959, the Department of Physics conducts research in many frontier areas in the sylvan campus of IIT Madras. The areas include experimental solid-state physics, quantum

electronics, optical and laser physics, soft condensed matter physics and various aspects of theoretical and computational physics, ranging from condensed matter to string theory and cosmology.

### 4.16.2. Academic Programmes

Engineering Physics (B. Tech.), Dual Degree (B.S. and M.S.), M. Sc., M. Tech. (Functional Materials and Nanotechnology) and Ph.D.

### Students on roll as of September 2020+M.S. and Ph.D. admission in January 2021

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	40	31	23	24	2	120
Dual Degree	13	12	16	12	12 + 1	66
M.Sc.	42	43			2	87
M.Tech.	13	9			1	23
Ph.D.	40	45	40	31	25 + 30	211
Total	148	140	79	67	73	507*

### Student/Scholar who attended conferences/seminars/symposia abroad/India

S. No.	Student/Scholar	Roll No.	Conference/Seminar/Symposium/Workshop	Date and Venue	Financial Assistance from
<b>Abroad</b>					
1	Md. Alibordi	PH15D043	International Conference on High Energy Physics 2020	28 July-6 August 2020, Prague, Europe (virtual)	IIT Madras
2	Niharika Rout	PH16D021	International Conference on High Energy Physics 2020	28 July-6 August 2020, Prague, Europe (virtual)	IIT Madras
3	Ashish Sharma	PH15D201	HIGGS 2020 Conference	26-30 October 2020 Rome, Italy (virtual)	IIT Madras
4	Niharika Rout	PH16D021	Belle II Physics Week at KEK	30 November-4 December 2020, Tsukuba, Japan (virtual)	IIT Madras
5	Anita	PH15D203	Belle II Physics Week at KEK	30 November-4 December 2020, Tsukuba, Japan (virtual)	IIT Madras
6	Raghunath Pradhan	PH18D026	International Conference on Initial Stages of High Energy Nuclear Collisions at Weizmann Institute of Science	10-15 January 2021, Rehovot, Israel (virtual)	IIT Madras

7	Akash Mohapatra	PH16D001	APS March Meeting 2021	16 March 2021 (virtual)	IIT Madras
<b>India</b>					
1	Sana Fathima	PH17D201	Conference on Current Innovations and the Future of Therapeutic Developments (CIFTD 2020)	1-3 June 2020 (virtual)	IIT Madras
2	Dhanya	PH17D305	International Virtual Conference on Advanced Nanomaterials and Applications (VCAN)	17-19 June 2020 (virtual)	IIT Madras
3	Sana Fathima	PH17D201	International Virtual Conference on Advanced Nanomaterial Applications (VCAN 2020)	17-19 June 2020 (virtual)	IIT Madras
4	Vetrivel	PH17D300	International Virtual Conference on High- Performance Materials for Energy, Environment and Healthcare in the Digital Era	30 June-1 July 2020 (virtual)	IIT Madras
5	Dipsikha Ganguly	PH16D301	Novel Electrochemical Energy Devices for Storage (NEEDS-2020) Conference	17-19 August 2020 (virtual)	IIT Madras
6	Suvashis Maity	PH18D024	CoCo 2o2o: Cosmology in Colombia	23-25 September 2020 (virtual)	IIT Madras
7	Pankaj Saha	PH19IPF02	Physics of the Early Universe – An Online Precursor by International Centre for Theoretical Studies	31 August-3 September 2020, Bengaluru, India (virtual)	IIT Madras
8	Debottam Nandi	PH17IPF05	Physics of the Early Universe – An Online Precursor by International Centre for Theoretical Studies	31 August-3 September 2020, Bengaluru, India (virtual)	IIT Madras
9	H. V. Ragavendra	PH16D018	Physics of the Early Universe - An Online Precursor, conducted by the International Centre for Theoretical Studies	31 August-3 September 2020, Bengaluru, India (virtual)	IIT Madras
10	Sagarika Tripathy	PH17D025	Physics of the Early Universe - An Online Precursor by International Centre for Theoretical Studies	31 August-3 September 2020, Bengaluru, India (virtual)	IIT Madras
11	Suvashis Maity	PH18D024	Physics of the Early Universe - An Online Precursor by International Centre for Theoretical Studies	31 August-3 September 2020, Bengaluru, India (virtual)	IIT Madras
12	Dipsikha Ganguly	PH16D301	Workshop on Hydrogen Day	8 October 2020 (virtual)	IIT Madras
13	Vetrivel	PH17D300	Workshop on Hydrogen Day	8 October 2020 (virtual)	IIT Madras
14	Dhanya	PH17D305	Accelerating hydrogen and fuel cell technology	8 October 2020 (virtual)	IIT Madras
15	H. V. Ragavendra	PH16D018	Less traveled path of dark matter: axions and primordial black holes, conducted by the International Centre for Theoretical Studies	9-13 November 2020, Bengaluru, India (virtual)	IIT Madras

16	Sagarika Tripathy	PH17D025	Less traveled path of dark matter: axions and primordial black holes, International Centre for Theoretical Studies	9-13 November 2020, Bengaluru, India (virtual)	IIT Madras
17	Suvashis Maity	PH18D024	Less traveled path of dark matter: axions and primordial black holes, International Centre for Theoretical Studies	9-13 November 2020, Bengaluru, India (virtual)	IIT Madras
18	Suvashis Maity	PH18D024	Kenyon-IITM Writing Workshop by IIT Madras	13-18 December 2020, Chennai, India (virtual)	IIT Madras
19	H. V. Ragavendra	PH16D018	Kenyon-IITM Writing Workshop by IIT Madras	13-18 December 2020, Chennai, India (virtual)	IIT Madras
20	Anamika Ghosh	PH16D200	Evolution of electronic structure theory and experimental realization (EESTER- 2020)	14-18 December 2020 (virtual)	IIT Madras
21	Niharika Rout	PH16D021	DAE-BRNS High Energy Physics Symposium at NISER	14-18 December 2020 (virtual)	IIT Madras
22	Anita	PH15D203	DAE-BRNS High Energy Physics Symposium at NISER	14-18 December 2020 (virtual)	IIT Madras
23	Md. Alibordi	PH15D043	DAE-BRNS High Energy Physics Symposium at NISER	14-18 December 2020 (virtual)	IIT Madras
24	Ashish Sharma	PH15D201	DAE-BRNS High Energy Physics Symposium at NISER	14-18 December 2020 (virtual)	IIT Madras
25	Pritam Kalbhor	PH16D038	DAE-BRNS High Energy Physics Symposium at NISER	14-18 December 2020 (virtual)	IIT Madras
26	H. V. Ragavendra	PH16D018	The XXXI Meeting of the Indian Association for General Relativity and Gravitation by IIT Gandhinagar	19-20 December 2020, Gujarat, India (virtual)	IIT Madras
27	Tulika Agrawal	PH18D010	IITM-University of Sydney Joint workshop on Translational Health Science	15-16 February 2021 (virtual)	IIT Madras
28	Vijay Kumar Sagar	PH15D048	IITM-University of Sydney Joint workshop on Translational Health Science	15-16 February 2021 (virtual)	IIT Madras
29	Soumyodeep Dey	PH16D041	IITM-University of Sydney Joint workshop on Translational Health Science	15-16 February 2021 (virtual)	IIT Madras
30	Dipsikha Ganguly	PH16D301	World Nano Congress on Advanced Science & Technology (WNCST- 2021)	8-13 March 2021 (virtual)	IIT Madras

### Students/Scholars who won outside prizes and awards

S. No.	Student/Scholar	Roll No.	Prize	Prize awarded by
1	Roshna Sobhanan Helen	PH15D008	Editor's Pick on her paper, Evidence of Weak Antilocalization in Quantum Interference Effects of (001) Oriented $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3\text{-SrRuO}_3$ superlattices	<i>Journal of Applied Physics</i>

2	Umesh Kumar Sinha, Bibekananda Das	PH13D053 PH16D004	Hot Article Collections on the paper, Interfacial reconstruction in $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ thin films: giant low-field magnetoresistance	Nanoscale Advances
3	Tulika Agrawal	PH18D010	Best Poster Presentation Award for poster, Gold nanoparticle embedded microcavity for sensing applications, at the two-day Translational Health Science Workshop	IIT Madras and University of Sydney
4	Resmi P.K.	PH14D039	IPA Rahul Basu Memorial Award for Best Thesis in Particle Physics in 2018-2020	Indian Physics Association
5	Atal Bihari Swain	PH13D073	AVH Fellowship	Humboldt Foundation Germany
6	Merin Jose	PH17D004	Soft Matter Poster Prize for her poster, Evaporative self-assembly of binary mixture of soft colloids, at the Soft Matter: Young Investigators e-Meet 2020	Royal Society of Chemistry
7	Sourav Kumar Kajli	PH15D037	Best Oral Presentation Award for presentation, Length and diameter dependent electrical transport properties of individual cupric oxide nanowire, at SRM-ICONN	International Conference on Nanoscience and Nanotechnology (ICONN)

### Students/Scholars who won Institute Convocation/Institute Day Prize

S. No.	Student/Scholar	Roll No.	Prizes	Donor
1	Ajay Piriya	PH15D302	Best Thesis in Ph.D. in Energy/Physics 2020	IIT Madras
2	Ajay Piriya	PH15D302	GE Ecomagination Excellence Award 2020	IIT Madras, GE
3	Meenakshi Seshadri	PH15D004	Institute Research Award 2020	IIT Madras
4	Sai Smruti Samantaray	PH15D009	Bhagyalakshmi & Krishna Ayengar Award 2020	IIT Madras
5	Pranab Parimal Biswas	PH14D012	Prof A L Lashkar Prize Award 2020	IIT Madras
6	Pradip Laha	PH13D040	Prof A L Lashkar Prize Award 2020	IIT Madras
7	Subhajit Pal	PH15D041	Institute Researcher Award 2020	IIT Madras
8	Sourav Banerjee	PH13D204	Institute Researcher Award 2020	IIT Madras
9	Ajay Piriya	PH15D302	Abayambal and Natarajan Award for best thesis 2020	IIT Madras

### 4.16.3. Faculty and Their Specialisations

#### Faculty

Name and Qualifications	Major Areas of Specialisation
<b>Professors</b>	
Dr Sethupathi K. (Head)	Experimental condensed matter physics, magnetic oxide materials and cryogenic insulation
Dr Arul Lakshminarayan	Quantum information, complex quantum systems, mathematical physics

Name and Qualifications	Major Areas of Specialisation
Dr Ganesan A. R.	Applied optics, holography, adaptive optics
Dr Harish Kumar N.	Superconductivity, spintronics, novel magnetic materials
Dr James Frederick Libby	Experimental high energy physics
Dr Jatindra Kumar Rath	Photovoltaics, nanomaterials, CVD
Dr Kasiviswanathan S.	Near- and far-field response of plasmonic structures, films of transparent oxide and ternary semiconductors, systems exhibiting quantum coherence
Dr Lakshmi Bala S.	Quantum dynamics and dynamical systems
Dr Manoj Gopalakrishnan	Theoretical biological physics, stochastic processes, statistical mechanics
Dr Markandeyulu G.	Magnetism, magnetic materials
Dr Murugavel P.	Multiferroic oxides, photo-ferroelectricity, energy storage materials.
Dr Neelima M. Gupte	Nonlinear dynamics, statistical physics
Dr Nirmala R.	Intermetallics, rare earth intermetallics
Dr Prafulla Kumar Behera	Experimental high energy physics, particle detector development and instrumentation
Dr Prasanta K. Tripathy	String theory, high energy physics
Dr Prem B. Bisht	Ultrafast laser spectroscopy, fluorescence microscopy
Dr Rajesh Narayanan	Condensed Matter Theory
Dr Ramachandra Rao M. S.	Correlation effect in metal oxide and doped diamond, electrical, optical and magnetic properties of metal oxide thin films and nanostructures and photovoltaic materials
Dr Santhosh P. N.	Multiferroics, layered oxide materials, CuO-based nanomaterials
Dr Satyanarayana M. V.	Quantum optics, laser physics, photonics
Dr Veeturi Srinivas	Magnetic materials
Dr Sriramkumar L.	Gravitation and cosmology
Dr Subramanian V.	Microwave techniques, propagation and devices dielectrics and multiferroics
Dr Sunil Kumar P. B. (IIT Palakkad)	Soft condensed matter physics, biological physics and computational physics
Dr Suresh Govindarajan	String theory
Dr Vijayan C.	Nano-photonics, light-matter interaction
<b>Associate Professors</b>	
Dr Aravind G.	Autoionization and autodetachment resonances in atomic, molecular and cluster systems
Dr Dawood Kothawala	Semi-classical gravity, quantum mechanics of black holes, QFT with minimal length scale
Dr Dillip Kumar Satapathy	Experimental soft condensed matter physics, x-ray and neutron characterization of materials organic and hybrid thermoelectrics
Dr Jayeeta Bhattacharyya	Semiconductors, optical spectroscopy, THz spectroscopy
Dr Krishnamurthy C. V.	Non-destructive evaluation, microstructural modelling, light scattering



Name and Qualifications	Major Areas of Specialisation
Dr Mahaveer Kumar Jain	Semiconductors, photovoltaics, chemical sensors
Dr Manu Jaiswal	Experimental condensed matter physics, graphene and 2D systems, confined water
Dr Pattabiraman M.	Experimental atomic physics, quantum optics, magnetometry
Dr Prabha Mandayam	Quantum information and computing, quantum optics
Dr Prahallad Padhan	Magnetic materials and heterostructures, spintronic devices
Dr Ranjit Kumar Nanda B.	Condensed matter physics
Dr Sivarama Krishnan	Femtosecond dynamics, photonics, quantum dynamics
Dr Somnath Chanda Roy	Experimental materials science, nanomaterials and thin films, nanotechnology for energy and environment
Dr Sudakar Chandran	Materials for energy applications, defect-structure property correlations, multifunctional materials
<b>Assistant Professors</b>	
Dr Abhishek Misra	Electrical transport in quantum materials, device physics, nanoelectronics
Dr Ashwin Joy	Condensed matter physics
Dr Ayan Mukhopadhyay	Theoretical physics, quantum field theory and string theory, quantum many-body systems
Dr Basudev Roy	Soft condensed matter physics, optics and optical tweezers
Dr Chandra Kant Mishra	Gravitational waves
Dr Panchanana Khuntia	Experimental condensed matter physics
Dr Prabhat Ranjan Pujahari	Experimental high energy physics
Dr Shanthanu Mukherjee	Condensed matter theory
Dr Sunethra Ramanan	Nuclear structure, renormalization group/effective field theory approaches, neutron star physics
Dr Vaibhav Madhok	Quantum information theory, chaos and complex systems
Dr Yasir Iqbal	Theoretical condensed matter physics, strongly correlated systems, frustrated magnetism
Dr Vidya Praveen Bhallamudi (ID)	Condensed matter physics magnetism, magnetic resonance, optics
<b>Distinguished Professors</b>	
Prof. G. Baskaran	
IMSc, Chennai	Condensed matter physics and strongly correlated materials
Prof. Ramamurti Shankar	Theoretical particle physics and condensed matter physics
<b>Emeritus Faculty</b>	
Prof. Ramaprabhu S. (Emeritus Professor)	Nanomaterials, energy storage, energy utilization
<b>Visiting Faculty</b>	
Prof. Surendra Pal Singh, University Distinguished Professor, University of Arkansas, Fayetteville, USA	Lasers, quantum, classical, and nonlinear optics, light-matter interaction, optical techniques in biophysics
Prof. Marcel Mudrich, SPARC - Aarhus University	Nature and technology, molecules and atoms, spectroscopy, molecular physics



Name and Qualifications	Major Areas of Specialisation
Prof. Shiv Kumar Sethi, Raman Research Institute, Bengaluru	Cosmology
Dr Srinivasan Krishnamurthy, Emeritus Scientist, SRI International, Menlo Park, CA	Dielectric metamaterials, nonlinear absorption and high-intensity light propagation in semiconductors, high-field transport in submicron devices, and optical properties of semiconductors, modeling MBE growth
<b>Adjunct Faculty</b>	
Prof. V. Balakrishnan, IIT Madras	Dynamical systems, quantum dynamics and stochastics
Prof. Shanker Balasubramanian, University Distinguished Professor, Michigan State University, USA	Applied electromagnetics, computational electromagnetics, non-linear materials
Prof. P. C. Deshmukh IIT Tirupati	Atomic and Molecular Physics
Dr Rajeev Pattathil, Rutherford Appleton Laboratory	Novel accelerator science
Prof. Peter van Straten, Utrecht University	Optics and photonics
Prof. Sampath Kumaran, Distinguished Professor, Tata Institute of Fundamental Research, Mumbai	Magnetism, superconductivity, physics of d- and f-electron systems (oxides and intermetallics), Kondo lattices, geometrically frustrated magnetism, spin-chain magnetism, multiferroics, nanomagnetism
Prof. Werner Paulus, Professor, University of Montpellier	Non-stoichiometric oxides, low-T reactivity of solids, materials for energy storage and transformation
Prof. Prellier Wilfrid, Director, CRISMAT Laboratory	Thin film
Prof. Miryala Muralidhar, Professor, Dy. President, Shibaura Institute of Technology (SIT), Tokyo, Japan	Superconductor, magnetization
Prof. Bent Weber School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore	Electronic properties of novel two-dimensional and topological materials, quantum information processing science and technology, nanoelectronics and quantum device physics, structural and electronic characterizations of materials using scanning probe microscopy
Prof. Murukeshan, Director, Centre for Optical and Laser Engineering, Nanyang Technological University, Singapore	Optical engineering, optomechanics
Prof. Dr Ronny Thomale, Julius-Maximilian's University of Würzburg, Germany	Theoretical condensed matter physics, strongly correlated electron systems
<b>DST INSPIRE Faculty</b>	
Dr K. Lakshmi Ganapathi	Nanoelectronics devices, device physics, 2D materials and high-k dielectrics integration, thin films synthesis, properties and their applications
<b>DST Ramanujan Fellow</b>	
Dr Pramoda Kumar Nayak	Two-dimensional materials, topological insulators, quantum dots, van der Waals heterostructures, novel superconducting materials

**Short-term courses/workshops/seminars/symposia/conferences organised by the faculty members**

S. No.	Coordinator(s)	Title	Period
<b>Conferences</b>			
1	Dr Robert Branden Berger (McGill University), Dr Jerome Martin (Institut d'Astrophysique de Paris), Dr Subodh Patil (Leiden University), Dr L. Sriramkumar, IITM	Physics of the Early Universe—An Online Precursor, held by the International Centre for Theoretical Studies, Bengaluru, India	31 August-3 September 2020
2	Dr Prem B Bisht	Organised a two-day online workshop, IIT Madras-University of Sydney joint workshop on Translational Health Science (virtual)	15-16 March 2021

**Short-term courses/workshops/seminars/symposia/conferences/trainings attended by the faculty members in academic institutions and public sector undertakings**

S. No.	Faculty Member	Title	Institution	Period
<b>Workshop</b>				
1	Dr Jim Libby	Belle II Physics Week (Organizing Committee Member)	KEK, Japan	30 November-4 December 2020
<b>Seminars</b>				
1	Dr Prabhat Pujahari	The Perfect Liquid	IIT Bombay (virtual)	2 June 2020
2	Dr Prafulla Kumar Behera	Introduction to Particle Detector	Kendrapara College, Odisha	29 June 2020
3	Dr Prabhat Pujahari	Collectivity in hadronic collisions	GSI, Germany (virtual)	28 January 2021
<b>Symposium</b>				
1	Dr Jim Libby	DAE-BRNS HEP Symposium (National Organizing Committee member)	NISER, Bhubaneswar	14-18 December 2020
<b>Conferences</b>				
1	Dr Prem B Bisht	Hybrid system of different shapes of gold nanoparticles on microcavity to study Purcell effect	SPIE Photonics Europe, 2020 France	6-10 April 2020
2	Dr L. Sriramkumar	Physics of the Early Universe - An Online Precursor	International Centre for Theoretical Studies, Bengaluru, India (Virtual)	31 August-3 September 2020
3	Dr Manu Jaiswal	3rd Conference on Quantum Condensed Matter Physics 2020	S. N. Bose National Centre for Basic Sciences, Kolkata	7-11 September 2020
4	Dr Prafulla Kumar Behera	CMS Flavor Highlights and Prospects	Kavli, IPMU, Japan	21-24 September 2020
5	Dr Jim Libby	BEAUTY 2020 (Invited talk)	IPMU Tokyo, Japan	21-24 September 2020

6	Dr Prem B Bisht	Imaging Technologies in Precision Agriculture and Agricultural Produce	IIT Madras and Pravartak, Canada Joint Conference	23-30 October and 6 November 2020
7	Dr L. Sriramkumar	Less Traveled Path of Dark Matter: Axions and Primordial Black Holes	International Centre for Theoretical Studies, Bengaluru, India (virtual)	9-13 November 2020
8	Dr Yasir Iqbal	Young Investigator Meet on Quantum Condensed Matter Theory	NISER, Bhubaneswar, India	15-18 December 2020
9	Dr L. Sriramkumar	The XXXI Meeting of the Indian Association for General Relativity and Gravitation	Indian Institute of Technology, Gandhinagar, India (virtual)	19-20 December 2020
10	Dr Yasir Iqbal	Entanglement in Strongly Correlated Systems	Centro de Ciencias de Benasque Pedro Pascual, Benasque, Spain	14-26 February 2021
11	Dr Prem B Bisht	Time Resolved Microscopy of Luminescent Nanodiamonds - Microcavity System	Focus on Microscopy	29 March 2021

### Special lectures delivered by the faculty in other institutions

S. No.	Faculty	Topic of Lecture	Institution	Date
1	Dr Somnath C Roy	Nanotechnology today: from basic research to daily life (web lecture)	GSFC University, Vadodara (virtual)	24 April 2020
2	Dr Somnath C Roy	The Fascinating World of Nanomaterials (web lecture)	ICFAI University Tripura (virtual)	25 May 2020
3	Dr Prafulla Kumar Behera	Discovery of Higgs at LHC and future	IAPT, Chennai	29 June 2020
4	Dr Jim Libby	Relativistic kinematics (five lectures) - India CMS graduate training	TIFR (Virtual)	6-11 July 2020
5	Dr Prem B Bisht	Nonlinear optics and applications	STPIP 2020, University of Madras	24 July 2020
6	Dr Prafulla Kumar Behera	Crack in the CP mirror	IAPT, Chennai	1 August 2020
7	Dr Jim Libby	Belle II: Flavour physics (and more) at the intensity frontier - INO outreach lecture	TIFR (virtual)	5 August 2020
8	Dr Somnath C Roy	Recent advances in one dimensional heterostructures for solar energy harvesting	CSIR-NAL Bangalore (virtual)	24 August 2020
9	Dr L. Sriramkumar	Formation of structure in the universe	Online talk at ACT NEXT Department of Physics, Alagappa University, Karaikudi, India	11 September 2020

S. No.	Faculty	Topic of Lecture	Institution	Date
10	Dr Yasir Iqbal	"Completing the square" in frustrated magnets	Okinawa Institute of Science and Technology (OIST), Okinawa, Japan	30 September 2020
11	Dr V. Balakrishnan	The central force problem in n dimensions	IIT Madras (virtual)	7 October 2020
12	Dr Jim Libby	Searching for beauty: finding one in a billion with the CMS experiment - National Academy of Sciences, India outreach lecture	CMI (virtual)	24 October 2020
13	Dr P Murugavel	Magnetoelectric effect and the way to enhance it in laminate composite structure	NIT Andhra Pradesh (virtual)	30 October 2020
14	Prof. Dawood Kothawala	Physics colloquia: Spacetime singularities in gravitational collapse and cosmology	IIT Madras (virtual)	4 November 2020
15	Dr Jim Libby	Rare kaon decays: status of the NA62 and KOTO experiments	IISER, Pune (virtual)	10 December 2020
16	Dr P Murugavel	Multifunctional properties of modified ferroelectric BaTiO <sub>3</sub> oxides	NSFD-2021, RTM Nagpur University	13 January 2021
17	Dr Manu Jaiswal	Thermal applications of graphene and its nanostructures	BMS College of Engineering Bangalore (virtual)	16 February 2021
18	Dr Prem B Bisht	Time resolved microscopy and imaging	IIT(ISM) Dhanbad in Physics Refresher course	18 February 2021
19	Dr S. Ramaprabhu	Materials for environment and energy applications	Jawaharlal Nehru Technological University, Hyderabad	1 March 2021
20	Dr S. Ramaprabhu	Nano-carbon polymer composites based flexible strain sensor and other flexible devices	TATA Promoting TSAMRC projects (virtual)	5 March 2021
21	Dr P Murugavel	Ferroelectric oxides in energy related applications	NIT Trichy	13 March 2021

### Honours and awards obtained by faculty

S. No.	Faculty Member	Award	Awarded by	Awarded for	Date of Award
<b>i. Honours</b>					
1	Dr C. Vijayan	IOP Publishing's Top Cited Paper Award (India)	Institute of Physics	For most cited articles from India published across the entire IOP, UK's publishing journal portfolio in the past three years (2017-2019)	2020

2	Dr Basudev Roy	Intermediate Fellowship under title, Rheology of cells and cell membranes using pitch rotational mode of optical tweezers	DBT- Welcome Trust India Alliance	Basic Biomedical Research category for the year 2020: the fellowship provides research grant of about Rs. 3.6 crore spread over a span of five years	January 2021
3	Dr Subramanian V	Fellow of The Academy of Sciences, Chennai	The Academy of Sciences, Chennai	December 2020	

**ii. Award**

1	Dr Dillip Kumar Satapathy	IOP Trusted Reviewer	IOP Publishing	For exceptionally high level of peer review competency	2021
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**Journal Editorial Boards**

S. No.	Faculty Member	Position	Journal Name
1	Prof. Nirmala R.	Member of Editorial Board	<i>Journal of Magnetism and Magnetic Materials</i> published by Elsevier

**4.16.4. Design and Development Activities****New facilities added or major equipment procured**

S. No.	Equipment	Value (Rs. in lakh)
1	Dell Precision 7920 workstations x 2 (24 C)	26,23,425

**Patents****Patents filed**

S. No.	Faculty Member	Topic of Patent
1	Dr Basudev Roy	Laser induced micro bubble-based patterning of biological macromolecules towards bio-sensing applications

**Patents awarded**

S. No.	Faculty Member	Topic of Patent
1	Dr P Murugavel	Fabrication of eco-friendly organic ferroelectric diisopropylammonium bromide films

**4.16.5. Research and Consultancy****Sponsored research projects (ongoing and new)**

S. No.	Title	Period	Funding Agency	Amount (Rs. in lakh)	Coordinators
1	Single crystal growth magnetic, electronic and thermal transport studies of multi-functional materials: oxides, intermetallics and polymers - FIST	31 March 2017-30 March 2022	Department of Science & Technology	385.00	Dr Santhosh P N

2	Indigenous low-cost compact optical non-contact device for in-situ characterisation of soft-matter	19 August 2017-31 March 2022	Impacting Research Innovation and Technology - IMPRINT	118.46	Dr Sivarama Krishnan, Dr Dillip K Satapathy
3	Fabrication of polymer-based materials for thermoelectric applications	24 February 2017-31 March 2022	Impacting Research Innovation and Technology - IMPRINT	329.00	Dr Dillip K Satapathy, Dr Ravikumar N V
4	Scaling electronic dynamics in finite quantum systems from angstrom to nanoscale	15 November 2016-31 October 2022	Max Planck Institute for Nuclear Physics	89.07	Dr Sivarama Krishnan
5	Probing interstellar and atmospheric anions through velocity map imaging	14 February 2017-31 March 2021	Indian Space Research Organization	25.80	Dr Aravind G
6	Surface dominated electronic transport in lateral and vertical two-dimensional layered topological insulator heterostructures- Ramanujan Fellowship	18 September 2017-17 September 2022	Department of Science & Technology	114.30	Dr Pramoda Kumar Nayak
7	2D semiconductor heterostructure devices for next generation electronics	5 June 2017-4 June 2022	Department of Science & Technology	86.27	Dr Lakshmi Ganapathi
8	Immobilization of calnuc protein on ZnO nanostructures film for biosensor applications	29 December 2017-28 June 2021	Department of Biotechnology	45.97	Dr Santhosh P N; Dr Gopala Krishna A, BT; Dr Murugavel P
9	Emergent phenomena in frustrated magnets and Heusler materials	6 July 2018-5 July 2021	Department of Science & Technology	42.20	Dr Panchanana Khuntia
10	Investigation of Spin Hall Magnetoresistance (SMR) in highly spin-orbit coupled oxide/magnetic insulator heterostructures-DST SERB	16 July 2018-15 July 2021	Department of Science & Technology	28.60	Dr Ramachandra Rao M S; Dr Sethupathi K
11	A novel paradigm for strongly correlated systems- Ramanujan Fellowship	5 June 2018-4 June 2023	Department of Science & Technology	38.00	Dr Ayan Mukhopadhyay
12	Development of technology and processes to produce nanomaterials, nanocomposites, nanocoatings, nanolubricants and nanoceramics	8 January 2019-7 January 2022	Department of Science & Technology	919.95	Dr Ramachandra Rao MS; Dr Bhattacharya SS, MM; Dr Ramaprabhu S; Dr Arunachalam N, ME
13	van der Waals heterostructures for non-volatile flash memory applications	19 March 2019-18 March 2022	Science and Engineering Research Board	41.91	Dr Abhishek Misra

14	A novel non-perturbative approach for understanding heavy-ion collisions	11 March 2019-10 March 2022	Science and Engineering Research Board	9.02	Dr Ayan Mukhopadhyay
15	Edge saturated Si <sub>2</sub> BN nano-ribbon as high-capacity anode materials for next generation Mg ion batteries	29 November 2018-28 November 2021	Science and Engineering Research Board	10.05	Dr Ranjit Kumar Nanda
16	Exploring magnetic, magnetocaloric and magnetoresistive properties of Ti (Fe <sub>1-x</sub> Cox) <sub>2</sub> (0<x<1)	4 December 2018-3 December 2021	Science and Engineering Research Board	10.05	Dr Nirmala R.
17	Setting up silicon detector characterization facility	20 March 2019-19 March 2022	Science and Engineering Research Board	39.95	Dr Prafulla Kumar Behera
18	Unravelling radiation damage processes in biologically relevant mesoscopic systems	15 March 2019-14 September 2021	Scheme for Promotion of Academic and Research Collaboration	74.27	Dr Sivarama Krishnan
19	Development of a diverse lab-on-a-chip platform for plastic electronics, microcatalysis and biosensing applications using microlithography by directed self-assembly driven by laser induced microbubbles	2 January 2019-1 January 2022	Impacting Research Innovation and Technology - IMPRINT	5.08	Dr Basudev Roy
20	Investigation of effect of carbon quantum dots on carrier generation in organic semiconductor thin films for photovoltaic applications	1 July 2019-31 March 2022	Council of Scientific and Industrial Research	13.23	Dr Jayeeta Bhattacharyya; Dr Vijayan C; Dr Debdutta Ray, EE
21	Thermoelectric power studies on materials showing simultaneous magnetic and crystal structural transitions	1 July 2019-31 March 2022	Council of Scientific and Industrial Research	13.00	Dr Nirmala R.
22	Exotic magnetic properties and spin dynamics of low dimensional and frustrated quantum magnets	16 May 2019-15 May 2022	Department of Science & Technology	90.89	Dr Panchanana Khuntia
23	Spin current transport across antiferromagnetic/metallic oxide interfaces	4 September 2019-3 September 2021	Department of Science & Technology	7.50	Dr Ramachandra Rao MS
24	Quantum information technologies with nitrogen vacancy and magnetic resonance	24 August 2020-23 August 2023	Department of Science & Technology	502.14	Dr Bhallamudi Vidya Praveen, Dr Ramachandra Rao MS, Dr Basudev Roy, Dr Ranjit K Nanda, Dr Sethupathi K, Dr Anil Prabhakar, EE



25	Development of large area two-dimensional layered quantum material for memristor applications	5 February 2020-4 February 2023	Ministry of Education	99.48	Dr Abhishek Misra; Dr Anbarasan P, CY; Dr Lakshmi Ganapathi; Dr Pramoda Kumar Nayak
26	Quantum emitters based on atomic defects in diamond and 2D materials	15 May 2020-14 May 2023	Ministry of Education	97.27	Dr Vidya Praveen, Dr Pramoda K Nayak
27	Reprogrammable polymer-based soft actuators	15 May 2020-14 May 2023	Ministry of Education	49.88	Dr Dillip Kumar Satapathy
28	Whispering gallery enabled light scattering: achieving enhanced efficiency in perovskite quantum dot sensitized mesoporous metal oxide whisperonic solar cells	15 May 2020-14 May 2023	Ministry of Education	99.41	Dr Sudakar Chandran, Dr Ranjit Kumar Nanda
29	Network models for climate studies	30 October 2019-29 October 2021	Department of Science & Technology	13.76	Dr Neelima M Gupte
30	Competing magnetic interaction as a route to giant exchange bias in layered perovskite oxides	26 March 2019-25 March 2022	Science and Engineering Research Board	14.25	Dr Santhosh P N
31	An experimental investigation of resonances and stable excited states of interstellar medium anions through photoexcitation	22 May 2019-21 May 2022	Science and Engineering Research Board	69.29	Dr Aravind G
32	Integration of PZT with 2D layered MoS <sub>2</sub> for low-power non-volatile memory and broad band photodetectors	22 May 2019-21 May 2021	Science and Engineering Research Board	56.46	Dr Lakshmi Ganapathi, Dr Sethupathi K, Dr Ramachandra Rao MS, Dr Pramoda K Nayak
33	Bolometer-based millimeter wave sensing for the development of microwave camera	6 July 2019-5 July 2022	Science and Engineering Research Board	40.52	Dr Subramanian V, Dr Ramachandra Rao MS
34	Investigating the observational imprints of non-trivial inflationary dynamics	2 July 2019-1 July 2022	Science and Engineering Research Board	10.19	Dr Sriramkumar L
35	Sn Integrated 3D, porous carbon-based scaffolds as high-capacity anode for sodium-ion batteries	21 October 2019-20 October 2022	Science and Engineering Research Board	10.05	Dr Sudakar Chandran
36	Exploring photocatalytic and photovoltaic properties of dimensionally tuned, vertically aligned BiFeO <sub>3</sub> nanorods and heterostructures	10 February 2020-9 February 2023	Science and Engineering Research Board	29.30	Dr Somnath Chanda Roy



37	Quantum chaos and many- body phenomena in the light of semi-classics and quantum information theory	16 December 2019-15 December 2021	Science and Engineering Research Board	14.45	Dr Vaibhav Madhok
38	Projective symmetry group classification of quantum spin liquids and spin nematics for systems with arbitrary spin	17 February 2020-16 February 2023	Science and Engineering Research Board	6.60	Dr Yasir Iqbal
39	Keldysh renormalization group for quantum spin liquids	16 December 2019-15 December 2021	Science and Engineering Research Board	31.50	Dr Yasir Iqbal
40	Flexible quantum light emitting devices from van der Waals layered materials	2 December 2019-1 December 2022	Impacting Research Innovation and Technology - IMPRINT	87.76	Dr Abhishek Misra, Dr Jayeeta Bhattacharyya, Dr Ramachandra Rao MS, Dr Lakshmi Ganapathi, Dr Pramoda Kumar Nayak
41	Development of high performance and low-cost boron-doped diamond electrodes for wastewater treatment	9 December 2019-8 December 2022	Impacting Research Innovation and Technology - IMPRINT	142.78	Dr Ramachandra Rao Dr Sathyan S, ME; Dr Kothandaraman Ramanujam, CY; Dr Arunachalam N, ME
42	Multifunctional plasmonic nanosystems for photodynamic therapy	1 April 2019-31 March 2021	Alumni Association	2.75	Dr Prem B Bisht
43	Nonclassical resources: from quantum simulations to incompatibility	24 February 2020-23 February 2023	Department of Science & Technology	63.65	Dr Arul Lakshminarayan, Dr Rajesh Narayanan, Dr Vaibhav Madhok, Dr Prabha Mandayam
44	Network planning of secured quantum key distribution network	24 February 2020-23 February 2023	Department of Science & Technology	51.10	Dr Prabha Mandayam, Dr Pradeep Sarvepalli EE
45	Physical and mathematical modelling of microtubule- cortex interaction and the dynamic of the mitotic spindle during eukaryotic cell division	18 November 2020-17 November 2023	Department of Science & Technology	23.65	Dr Manoj Gopalakrishnan
46	Waste Management Technology	4 February 2021-31 March 2022	Department of Science & Technology	4.45	Dr Sivarama Krishnan
47	Growth and systematic characterization of PLD grown large area ferroelectric PMN-PT thin film for naval device worthiness	3 February 2021-2 February 2023	Defence Research and Development Organisation	99.08	Dr Ramachandra Rao MS; Dr Sethupathi K

48	Intertwining crystal and orbital symmetries to explore novel nontrivial electronic phases	3 February 2021-2 February 2024	Science and Engineering Research Board	35.35	Dr Ranjit Kumar Nanda
49	Magnetocaloric and electrocaloric properties of Ru/Sn/Ti modified copper- zinc ferrite for refrigeration, solid-state cooling and energy storage applications	1 March 2021-28 February 2023	Science and Engineering Research Board	22.37	Dr Murugavel P
50	Primordial black holes and secondary gravitational waves from bouncing scenarios	8 February 2021-7 February 2023	Science and Engineering Research Board	22.37	Dr Sriramkuma L
51	Modelling strong electron phonon interactions in systems with emergent order	29 December 2020-28 December 2023	Science and Engineering Research Board	6.60	Dr Shantanu Mukherjee
52	Glass transition and turbulence in active fluids	28 December 2020-27 December 2023	Science and Engineering Research Board	26.51	Dr Ashwin Joy
53	Pairing in neutron-star matter with renormalization-group based low-momentum interactions	1 October 2020-30 September 2023	Indo-French Centre for the Promotion of Advanced Research	21.71	Dr Sunethra Ramanan
54	Correlated quantum materials: exploring spin transport properties in non- stoichiometric iridium oxide thin films and single crystals	1 October 2020-30 September 2023	Indo-French Centre for the Promotion of Advanced Research	74.11	Dr Ramachandra Rao MS
55	Novel non-perturbative approaches to strongly coupled QCD matter	1 October 2020-30 September 2023	Indo-French Centre for the Promotion of Advanced Research	29.89	Dr Ayan Mukhopadhyay
56	Numerical investigations of quantum spin liquids in SU (N) antiferromagnetic models	19 April 2021-18 April 2024	Indo-French Centre for the Promotion of Advanced Research	17.79	Dr Yasir Iqbal
57	Rheological studies of activity of the cell membrane, cytoplasm and organelles using new rotational mode of probing in optical tweezers	1 January 2021-31 December 2025	Wellcome Trust	317.43	Dr Basudev Roy
58	Development of high performance and low-cost boron-doped diamond electrodes for wastewater treatment	18 May 2020-8 December 2022	Kapindra Precision Engineering Private Limited	3.00	Dr Ramachandra Rao MS; Dr Sathyan S, ME; Dr Kothandaraman Ramanujam, CY; Dr Arunachalam N, ME

59	Development of technology and processes to produce nanomaterials, nanocomposites, nanocoatings, nano-lubricants and nanoceramics	11 February 2021-7 January 2022	Tube Investments of India Limited	109.26	Dr Ramachandra Rao MS; Dr Bhattacharya SS, MM; Dr Ramaprabhu S; Dr Arunachalam N, ME
60	Flexible quantum light emitting devices from van der Waals layered materials	30 October 2019-29 October 2022	Ants Innovations Private Limited	23.125	Dr Abhishek Misra, Dr Ramachandra Rao MS, Dr Jayeeta Bhattacharyya, Dr Lakshmi Ganapathi K, Dr Pramoda Kumar Nayak
61	Experimental high energy physics	2021-2025	Ministry of Education	222	Dr James Libby, Dr Prafulla Kumar Behera, Dr Prabhat Pujahari
62	Reheating the universe: decoding the observational signatures	2020-2023	SERB	10.17	Dr Debapradad Maity, IIT, Guwahati, PI; Dr Sriramkumar, Co-PI
63	Femtosecond time-resolved spectroscopy of low dimensional systems	1 February 2019-31 January 2024	IIT Madras	1.98	Dr Prem B Bisht
64	Pre-Center of Excellence on Biosensing	4 February 2021-3 February 2022	Ministry of Education	290	Dr Prem B Bisht (PI)
65	Pre-Center of Excellence on Quantum Information, Communication and Computing	4 February 2021-3 February 2022	Ministry of Education	290	Dr Prem B Bisht (Co-PI); Dr Anil (PI-EE)
66	IIT Madras at CERN, Switzerland	30 January 2017-31 March 2021	Alumni	10.0	Dr Prafulla Behera
67	Compact Muon Solenoid (CMS) upgrade operation and utilisation	29 September 2016-31 December 2020	DST	332	Dr Prafulla Behera, Dr Prabhat Pujahari
68	R&D efforts by University Groups for INO projects	31 October 2013-31 March 2020	DST	322	Dr Prafulla Behera, Dr Anil Prabhakar, Dr Nagendra Krihnapurna, Dr Nitin Chandrachoodan, Dr Shanti Pavan, Dr Aniruddhan S
69	pCoE - Experimental high energy physics	4 February 2021-31 December 2026	Ministry of Education	229	Dr Prafulla Behera, Dr Prabhat Pujahari

70	Layered hexagonal boron nitride membranes towards water and moisture permeation studies	1 January 2021-31 December 2021	IITM-ERP	6.5	Dr Manu Jaiswal
71	Institute Research and Development Early Career Level Award	22 April 2019- 21 April 2022	Institute Research and Development Award	25	Dr Manu Jaiswal
72	Development and characterization of 3D graphene foam as a thermal insulator for space applications	31 October 2017-30 June 2020	ISRO	27.99	Dr Manu Jaiswal
73	TMDC Transistors interfaced with graphene electrodes on flexible substrates	25 March 2019-24 March 2021	SERB-NPDF	22.33	Dr Manu Jaiswal
74	Numerical investigations of quantum spin liquids in SU(N) antiferromagnetic models	19 April 2021-18 April 2024	Collaborative research project, Indo-French Centre for the Promotion of Advanced Research (CEFIPRA)	84	Dr Yasir Iqbal, Dr Didier Poilblanc
75	Numerical studies of novel quantum magnetic materials	31 January 2019-30 January 2022	New Faculty Seed Grant (NFSG), IIT Madras	26	Dr Yasir Iqbal
76	Immobilization of calnuc protein on ZnO nanostructured film for biosensor applications	Three years	DBT	53.6	Dr P. Murugavel, Co-PI
77	Compact solar desalination and cold storage systems	2021-2022	Centre of Excellence Project	431	Dr A.R. Ganesan, Co-PI; Dr A. Mani, PI, ME; Dr Shaligram Tiwari, Co-PI, ME
78	TiO <sub>2</sub> -based biomedical coating for artificial heart valve application	January 2020- January 2021	ICSR, IITM	9.50	Dr Somnath C Roy
79	Development of sensors for the detection of explosive agents	July 2017-March 2021	DRDO	82	Dr Somnath C Roy; Dr Ranjit K Nanda B
80	Development of technology and processes to produce nanomaterials, nanocomposites, nanocoatings, nanolubricants and nanoceramics	21 August 2017-20 August 2020	DST	1000	Dr S. Ramaprabhu, Dr MS Ramachandra Rao, Dr SS Bhattacharya

**Industrial consultancy projects (ongoing and new)**

S. No.	Faculty Member	Title	Industry	Amount (Rs. in lakh)
1	Dr Ramaprabhu S and Dr Manu Jaiswal (Co-PI)	Capture and conversion of CO <sub>2</sub> gas for automobile I.C. engine exhaust gases using nano composite materials	Tide Water Oil Company (India) Limited	25.00
2	Dr Ramachandra Rao MS	Process optimization of thin film piezoelectrics	Applied Materials	18.75
3	Dr Ramaprabhu S	Technology concept evaluation	Deloitte Touche Tohmatsu India LLP	17.70
4	Dr Prem B Bisht	Development of laser measurement devices	Laser Science Services India Private Limited	1.00
5	Dr Ramaprabhu S and Dr Manu Jaiswal (Co-PI)	Study of GCN coating on glass to explore applications	Saint-Gobain Research India Private Limited	9.91
6	Dr Dillip Kumar Satapathy and Dr Santhosh PN (Co-PI)	XRD Measurement at advanced x-ray scattering laboratory	Common Code	5.00
7	Dr Ramachandra Rao MS, Dr Bhattacharya SS and Dr Ramaprabhu S (Co-PI)	Testing of internal samples by various sophisticated instruments	Common Code	5.90
8	Dr Ramachandra Rao MS and Dr Ramaprabhu S (Co-PI)	Testing of external sample by various sophisticated instruments	Common Code	5.00
9	Dr Murugavel P and Dr Dillip Kumar Satapathy (Co-PI)	Dielectric relaxation spectroscopic measurements at Physics Department facility	Common Code	5.00
10	Dr Murugavel P and Dr Dillip Kumar Satapathy (Co-PI)	Dielectric relaxation spectroscopic measurements at Physics Department facility - IT	Common Code	5.00
11	Dr Ramachandra Rao M S	Detailed characterization study on piezoelectric thin films (PZT) and single crystals for various piezosensors and actuator applications	Defence Research and Development Organization	23.72
12	Dr Ramaprabhu S and Dr Manu Jaiswal (Co-PI)	Synthesis and characterization of platinum nano-catalyst for fuel cell, hydrogen sensor applications in the context of cold trap regeneration of sodium cooled fast reactors	Indira Gandhi Centre for Atomic Research	42.48

**Faculty members' participation with other institution under MoU**

S. No.	Faculty Member	Participation Details	University/Institution
1	Dr Prafulla Kumar Behera	Collaborative research	University of Cantabria, Spain
2	Dr Prafulla Kumar Behera	Collaborative research	CERN, Switzerland
3	Dr Prem B Bisht	Collaborative research	University of Sydney, Australia
4	Dr Prem B Bisht	Collaborative research	University of Southampton, UK
5	Dr Yasir Iqbal	Collaborative research	University of Würzburg, Germany

**Distinguished visitors to the department (virtual)**

S. No	Faculty Member	Purpose of Visit	Date and Venue
1	Dr Cristina Marchetti, Santa Barbara; Dr Guruswamy Kumaraswamy, IIT Bombay; Dr Madan Rao, National Centre for Biological Sciences, Bangalore	Mini-Symposium on Soft, Active and Living Matter (a one-day symposium on Soft Matter Physics in memory of Dr Aditi Simha)	12 May 2020
2	Prof. G. Baskaran, IMSc, Chennai	Special seminar on Anderson Garden	17 July 2020
3	Prof. Jayant Murthy, Indian Institute of Astrophysics, Bangalore	Lecture on "Hrithik and the 2019 Physics Nobel Prize"	19 August 2020
4	Prof. Arindam Ghosh, IISc, Bangalore	Seminar on "Bottom-up engineering of new electronic and structural effects with atomic layers"	2 September 2020
5	Prof. Aditi Sen De, Harish-Chandra Research Institute (HRI), Allahabad	Seminar on "Quantum information processing with many-body systems"	23 September 2020
6	Prof. David Gross	Conference on The Dual Mysteries of Gauge Theories and Gravity	19 October 2020
7	Prof. David Gross, Leading Panelist	Panel discussion on Fundamental Physics and Society	24 October 2020
8	Prof. Takaaki Kajita, University of Tokyo, Japan	Brahmagupta Physics colloquium on "Research in Kamioka: neutrinos and gravitational waves"	9 December 2020
9	Prof. Tanusri Saha-Dasgupta, S.N. Bose National Centre for Basic Sciences, Kolkata	Brahmagupta Physics colloquium on "Electrons in complex materials: from theory to practice"	3 March 2021
10	Prof. Sunil Nair, IISER, Pune	Brahmagupta Physics colloquium on "Interplay of heat, charge and spin currents in some strongly correlated systems"	17 March 2021
11	Prof. Stephen Arnold, NYU Tandon School of Engineering, Brooklyn, NY	Brahmagupta Physics colloquium on "From the death of an icon to the birth of the world's most sensitive bio-sensor"	24 March 2021
12	Prof. Priyamvada Natarajan, Yale University, USA	The 2021 Lakshmi Raman Memorial Lecture on "Unraveling the formation and assembly history of supermassive black holes in the universe"	31 March 2021

## 5

## Sophisticated Analytical Instrument Facility

### 5.1. Introduction

The Sophisticated Analytical Instrument Facility (SAIF), established with financial support from the Department of Science and Technology, provides sophisticated instruments and equipment to students, scientists, researchers and faculty members from IIT Madras as well as academia, educational institutions, national laboratories, R&D establishments, and industries from all over India in general and south India in particular. The primary purpose is to enable the scientific community to collect data and carry out analysis using extremely sophisticated analytical equipment for advanced

research at very nominal rates.

SAIF also undertakes, on request, servicing of sophisticated analytical instruments at other institutions and provides training in the operation and maintenance of such equipment. Periodically, SAIF conducts workshops, seminars and conferences to disseminate information on new trends in sophisticated instrumentation and methods in addition to providing training and hands-on experience. Students from educational institutions, colleges and schools visit SAIF regularly to gain exposure to the use of sophisticated instruments for analysis.

### 5.2. Employees and their Specialisations

Name and Qualifications	Major Areas of Specialisation
<b>Professor</b>	
Prof. S.S. Bhattacharya, Ph.D. [Head]	Nanocrystalline materials - synthesis and characterization, superplasticity - theoretical and experimental, metal forming
<b>Adjunct Professor</b> Prof. S. Subramanian, Ph.D.	Nuclear magnetic resonance spectroscopy, electron spin resonance spectroscopy
<b>Senior Technical Officer</b> C. Baby, Ph.D.	Nuclear magnetic resonance spectroscopy, fluorimetry
<b>Technical Officers</b> K.V. Rama, Ph.D. K.P. Paranjothi, Ph.D. Sudhadevi Antharjanam, Ph.D.	Analytical chemistry, ICP-OES, thermal and elemental analyses Mass spectroscopy, electronics and instrumentation Single crystal x-ray diffractometry, optical spectroscopy
<b>Junior Technical Superintendent</b> N.K. Gopinath, M.Sc., M.Phil.	Materials science
<b>Junior Technicians</b> P. Thiruppathi, IEEE A. Varalakshmi, M.Sc. P. V. Narayanan, M.Sc.	Electronics and instrumentation Chemistry Physics

### 5.3. Design and Development Activities

#### New major equipment procured

S. No.	Equipment	Value (Rs. in lakh)
1.	Liquid Chromatography Mass Spectrometry	193
2.	Gas Chromatography Mass Spectrometry	41.30

### 5.4. Other Activities of the Department

#### Major infrastructure development

The following two facilities are being set up with the equipment being procured through funds from Department of Science and Technology (DST), Government of India:

1. Gas Chromatography - Mass Spectrometry (GC-MS)
2. Ultra High Pressure Liquid Chromatography with Quadrupole Time of Flight High Resolution Mass Spectrometry (UHPLC-QTOF-HRMS)

The installation of these equipment required preparation of the site as per the safety and fire hazard norms of IIT Madras, followed by infrastructural requirements, including 24x7 air-conditioning, gas and water supply, UPS systems, etc.

The installation has been completed and the training of personnel in operating this equipment is in progress. Once this is done, the equipment will be available for measurement and characterisation by users on an appropriately chargeable basis.



## 6

## Centres of Special Facilities

### 6.1. Centre for Continuing Education

#### 6.1.1. Introduction

The Centre for Continuing Education (CCE) was established in June 1986. The centre supports faculty members in meeting the following objectives of IIT Madras:

- Providing knowledge-based technological services to satisfy the needs of society and industry
- Helping build national capabilities in science, technology, humanities, management, education and research
- Effectively participating and contributing to the institute's commitment of providing a broad base of learning opportunities through the following major activities:
  1. Conducting PhD programme under the Quality Improvement Programme (QIP) sponsored by the AICTE
  2. Conducting short-term courses (STCs) sponsored by the AICTE
  3. Writing books under the Book Writing Scheme

4. Conducting Continuing Education Programmes (CEPs) for professionals from industry
5. Developing and conducting User-Oriented Programmes (UOPs) for specific industries through which their engineers acquire higher degrees (M.Tech.)
6. Developing and conducting web-enabled M.Tech. programmes for industries.
7. Conducting courses under National Programme on Technology-Enhanced Learning (NPTEL)
8. Recording important activities through the facilities in the Central Photographic Section
9. Conducting conferences/seminars/workshops/symposia
10. Allotment of ISBN numbers for textbooks and other publications of faculty members
11. Conducting courses under Global Initiative of Academic Networks (GIAN) sponsored by the Ministry of Education
12. Conducting courses under IIT PAL

#### 6.1.2. Quality Improvement Programme

The faculty development activities under AICTE that are funded by the Ministry of Education are geared to ensure quality, relevance, excellence and equity in technical education by supporting activities under the Quality Improvement Programme (QIP) scheme. Deputation to the academic programmes (mainly to Ph.D.) of the institute facilitates the career development of the faculty members of AICTE-approved technical institutions in the country.

Since the inception of the programme to 2020-2021, 562 faculty members from other institutions have obtained Ph.D. degrees and 610 faculty members have obtained M.Tech. degrees. The M.Tech. programme has been discontinued by AICTE from 2020 since there are many institutions in the country offering the course.

Period	Ph.D.			M.Tech.		
	Admitted	No. on Roll	Awarded	Admitted	No. on Roll	Awarded
2020-2021	8	33	8	--	--	--
Since inception	689 (681 +8)	—	562 (554+8)	643	—	610

### Short-term training programmes under QIP

Organisation of short-term courses under QIP for faculty members of engineering institutions is supported by the AICTE, and these courses (AICTE-STC) open avenues in which the institute's faculty members with rich experience in new and upcoming areas can share their expertise with others. Under this programme, 12 courses (with a total duration of 12 weeks) were conducted during 2020-2021 and 402 teachers of engineering institutions participated. From 1970-1971 to 2020-2021, 450 (438+12) programmes have been conducted, and 10,265 (10,863 +402) teachers from various engineering colleges have participated and benefited from these courses.

The details of the courses conducted in 2020-2021 are given in the following table:

List of Short-Term Course under QIP (AICTE-STC-2020-21)

S. No	Coordinators	Department	Title and Project No	Date	Participants
1.	Prof. V Krishna Nandivada	Computer Science and Engineering	Compiler Design CCE/QIP/01/VKN/CSE/2020-21	18-23 January 2021	13
2.	Prof. Srinivasan Chandarsekaran	Ocean Engineering	Advanced Steel Design CCE/QIP/02/SC/OE/2020-21	25-30 January 2021	21
3.	Dr Nagabhushana Rao Vadlamani, Prof. A Sameen, Dr G Rajesh	Aerospace Engineering	Theory and Analysis of Compressible Turbulence CCE/QIP/05/NRV&AS&GA/AE/2020-21	22-27 March 2021	30
4.	Prof. GL Samuel	Mechanical Engineering	Smart Manufacturing and Metrology CCE/QIP/07/GLS/ME/2020-21	22-27 February 2021	34
5.	Dr Lakshmi Priya PS, Dr Rupen Goswami	Civil Engineering	Design of Steel Buildings for Earthquake and Fire CCE/QIP/08/LPPS&RG/CE/2020-21	15-20 March 2021	12
6.	Dr Shantanu Pradhan, Dr Vignesh Muthuvijayan	Biotechnology	Advances in Biomaterials and Tissue Engineering CCE/QIP/09/SP&VM/BT/2020-21	25-30 January 2021	55
7.	Dr Sivasrinivasu Devadula, Dr Piyush Shakya	Mechanical Engineering	Elements of Smart Manufacturing CCE/QIP/10/SD&PS/ME/2020-21	15-20 February 2021	35
8.	Dr Somashekhar S Hiremath	Mechanical Engineering	Enduring Trends in Hydraulic Control Systems: Past, Present and Future CCE/QIP/12/SSH/ME/2020-21	22 March 2021	43
9.	Prof. V. Subramanian, Dr C V Krishnamurthy	Physics	Principles and Advances in Electromagnetics CCE/QIP/13/VS&CV/PH/2020-21	22-27 March 2021	35
10.	Dr Chandan Sarangi, Dr Saumendra Kuiry, Prof. Shiva Nagendra	Civil Engineering	Modelling Air Quality and Hydro-Meteorological Extremes over Indian Mega-cities CCE/QIP/14/CS&SK&SN/CE/2020-21	22-27 March 2021	16
11.	Prof. Rajesh Kumar	Humanities and Social Sciences	Fundamentals of Language Science CCE/QIP/17/RK/HSS/2020-21	22-27 March 2021	38
12.	Prof. Hemachandran Karah	Humanities and Social Sciences	Indian Sign Language CCE/QIP/18/HC/HSS/2020-21	15-20 March 2021	70
<b>Total</b>					<b>402</b>

### 6.1.3. Continuing Education Programmes

Several short-term courses (STCs) were organised for professionals from industry and R&D establishments on a need basis. The programmes were tailor-made to suit the requirements of industries. The Continuing Education Programmes (CEPs) are divided in two categories: Internal CEPs and External CEPs. From their inception in 1980 to 2020-2021, 1,653 (1,604+49) STCs have been conducted, benefitting 5,38,628 (2,89,761+2,48,867) participants. NPTEL, which reaches out to hundreds of engineering colleges in the country, trained many students (2,48,867) and teachers. In 2020-2021, 48 STCs were conducted. The following table lists these STCs:

**List of Internal CEPs 2020-21**

S. No.	Department/s	Coordinator/s	Title of the Proceedings	Duration	Number of Participants
1.	Chemistry	Prof. Mangala Sunder	Data Science and Big Data Analytics (Basic)	11 April-21 June 2020, Continuing	33
2.	Chemistry	Prof. Mangala Sunder	Data Science and Big Data Analytics (Advanced)	11 April-22 November 2020, continuing	14
3.	Chemistry	Prof. Mangala Sunder	Cyber Security (Basic)	11 April-21 June 2020, continuing	21
4.	Chemistry	Prof. Mangala Sunder	Cyber Security (Advanced)	11 April-22 November 2020, continuing	8
5.	Chemistry	Prof. Mangala Sunder	Python Course on Multiple Languages	11 April-25 June 2020, continuing	114
6.	Chemistry	Prof. K. Mangala Sunder	Machine Learning Using Python - MOSPI	1 May-31 December 2020, continuing	554
7.	Management Studies	Dr V. Vijayalakshmi	Coaching with Depth	9 May-9 June 2020	10
8.	Management Studies	Dr V. Vijayalakshmi	Coaching with Depth	12 May-12 June 2020	4
9.	Humanities and Social Sciences	Prof. Rajesh Kumar	Creating Proficiency in English	24 May-5-August 2020	19
10.	Chemistry	Prof. Mangala Sunder	Certified Cyber Warrior	31 May 2020	37
11.	Management Studies	Dr Vijayalakshmi	Coaching with Depth	13-14 June 2020	10
12.	Chemistry	Prof. K. Mangala Sunder	Business Accounting Process - Executive	June 2020, ongoing	86
13.	Chemical Engineering	Prof. Niket Kaisara	Model Predictive Control: Theory and Practice	20-23 July 2020	15
14.	Management Studies	Dr Vijayalakshmi	Coaching with Depth	1 August 2020-31 February 2021	10
15.	Management Studies	Dr Vijayalakshmi	Coaching with Depth	1-2 August 2020	10
16.	Chemistry	Prof. K. Mangala Sunder	Introduction to Data Science and Machine Learning Using R Programming - Basic	17 August-31 October 2020	19
17.	Chemistry	Prof. K. Mangala Sunder	Introduction in Data Science using Python for School Students	17 August-30 September 2020	9

18.	Chemistry	Prof. K. Mangala Sunder	Advanced Course in Machine Learning Using Python Programming	17 August-30 November 2020	115
19.	Chemistry	Prof. K. Mangala Sunder	Introduction to Data Science and Machine Learning Using Python Programming - Basic	17 August-31 October 2020	77
20.	Chemistry	Prof. K. Mangala Sunder	Digital Banking	4 September-31 October 2020	54
21.	Management Studies	Dr Vijayalakshmi	Coaching with Depth	17 September 2020-31 May 2021	14
22.	Chemical Engineering	Prof. S. Pushpavnam	Process Modeling and Simulation	21-23 September 2020	50
23.	Chemistry	Prof. K. Mangala Sunder	Advanced Programme on Mutual Fund	2 October-30 November 2020	22
24.	Chemistry	Prof. K. Mangala Sunder	Securities Operations and Risk Management	2-31 October 2020	101
25.	Chemistry	Prof. K. Mangala Sunder	Programme in Banking and Finance	2-31 October 2020	42
26.	Management Studies	Dr V. Vijayalakshmi	Coaching with Depth	31 October-1 November 2020	8
27.	Management Studies	Dr V. Vijayalakshmi	Coaching with Depth	10 October 2020	13
28.	Management Studies	Dr V. Vijayalakshmi	Fundamentals of Coaching with Depth - Level 1 Certification	20 November 2020-31 July 2021	10
29.	Chemistry	Prof. K. Mangala Sunder	BFSI Sector: Equity Derivatives	1 December 2020-31 March 2021, continuing	25
30.	BT/RBCDSAI	Prof. Nirav P Bhatt	Course on Artificial Intelligence and Machine Learning	7-19 December 2020	
31.	Chemistry	Prof. K. Mangala Sunder	Business Accounting Process - Payroll	15 December 2020-30 April 2021	1
32.	Chemistry	Prof. K. Mangala Sunder	Business Accounting Process - Accounts Payable and Receivable	15 December 2020-31 May 2021	14
33.	Chemistry	Prof. K. Mangala Sunder	Nasscom IT-ITeS SSC: Big Data Using Apache Spark, Deep Learning Using Pytorch and Block Chain - MOSPI	15 December 2020-8 January 2021	85
34.	Chemistry	Prof. K. Mangala Sunder	Business Accounting Process - Accounts Executive (Recording and Reporting)	22 December 2020-30 June 2021	3
35.	Chemistry	Prof. K. Mangala Sunder	Business Accounting Process - Statutory Compliance	22 December 2020-31 May 2021	2

36.	Metallurgical and Materials Engineering	Prof. K. C. Hari Kumar	Advanced Computational Thermodynamics and Kinetics	10 January 2020-10 January 2021	25
37.	Ocean Engineering	Prof. Srinivasan Chandrasekaran	Advanced Steel Design	25-30 January 2021	3
38.	Mechanical Engineering	Prof. G.L. Samuel	Smart Manufacturing and Metrology	22-27 February 2021	9
39.	Humanities and Social Sciences	Aysha Iqbal	Course: Introduction to Film Studies	15 February-28 May 2021	100
40.	Humanities and Social Sciences	Dr Merin Simi Raj and Dr Merin Simi Raj	Placement Oriented Communication Skills Training	15-25 March 2021	70
<b>Total</b>					<b>1816</b>

**List of External CEPs 2020-21**

S. No.	Department/s	Coordinator/s	Title of the Proceedings	Duration	Number of Participants
1.	Electrical Engineering	Dr Qadeer Ahmad Khan	Power Management for Mobile Application	28-29 May 2020	100
2.	Management Studies	Prof. Usha Mohan	Optimization Training	28-30 May 2020	30
3.	Electrical Engineering	Prof. Shanthi Pavan	Short Course on Delta-Converter Design	29 June-9 July 2020	30
4.	Computer Science Engineering	Prof. Janakiram D	Advanced Certification in Software Engineering	30 September 2020, continuing	193
5.	Applied Mechanics	Dr Babji Srinivasan	Data Analytic Models	10 December 2020-10 February 21	35
6.	NPTEL	Prof. Andrew Thangaraj	IITM-NPTEL Online Certification Exam	1 January-31 December 2020	246568
7.	Electrical Engineering	Dr Radha Krishna Ganti	5G Specifications – A semester-long online training programme	1 February-30 April 2021	25
8.	Electrical Engineering	Prof. Shanthi Pavan	Practical Design of Data Converters	1-12 March 2021	70
<b>Total</b>					<b>247051</b>

**6.1.4. User-Oriented Programmes**

The User-Oriented Programmes (UOPs) are designed to suit the requirements of industrial organisations. Two-year M.Tech programmes are being organised to meet the specific needs of the associated industries. So far, 26 programmes have been conducted or are being conducted by the Departments of Civil Engineering, Ocean Engineering, Mechanical Engineering, Engineering Design and Management Studies.

**List of User-Oriented Programmes (UOPs)**

S. No.	Department/s	Coordinator/s	Title of the Proceedings	Project No
1.	Civil Engineering	Dr K. Ramamurthy and Prof. Koshy Varghese	Construction Technology & Management (CT&M)	CCE/CEP/UoP/19A/KR&KV/CE/16-17

2.	Civil Engineering	Dr K. Ramamurthy and Dr Koshy Varghese	UoP M.Tech (Construction Technology & Management) - 20th Batch	CCE/CEP/UoP/20/KR & KV/17-19
3.	Ocean Engineering	Dr. S. Nallayarasu and Prof. S. K. Bhattacharyya	M.Tech. Offshore Technology	CCE/CEP/UoP/12/OE/SN-SKB/11-12
4.	Management Studies	Prof. G. Srinivasan and Dr Rahul Marathe	VLM Project	CCE/CPE/UoP/18/VLM/15-16
5.	Civil Engineering	Dr R.G. Robinson	PG Diploma Programme on Metro Rail Technology and Management	CCE/CEP/UoP/21/RGR/CE/17-18
6.	Civil Engineering	Prof. K. Ramamurthy and Prof. Koshy Varghese	Construction Technology & Management (CT&M)	CCE/CEP/UoP/22/KR&KV/CE/18-19
7.	Civil Engineering	Dr R.G. Robinson	PG Diploma Programme on Metro Rail Technology and Management	CCE/CEP/UoP/23/RGR/CE/18-19
8.	Civil Engineering	Prof. K. Ramamurthy and Prof. Koshy Varghese	Construction Technology & Management (CT&M)	CCE/CEP/UoP/24/KR&KV/CE/19-20
9.	Civil Engineering	Dr R.G. Robinson	PG Diploma Programme on Metro Rail Technology and Management	CCE/CEP/UoP/25/RGR/CE/19-20
10.	Civil Engineering	Prof. K. Ramamurthy and Prof. Koshy Varghese	Construction Technology & Management (CT&M)	CCE/CEP/UoP/26/KR&KV/CE/20-21

### 6.1.5. Web-enabled M.Tech. programmes for industries

IIT Madras has been actively interacting with leading industries through R&D, consultancy projects and continuing education programmes. Several projects have been undertaken towards development of products and processes. Based on approval and guidelines of the Senate and the needs of industries, IIT Madras has come up with web-based M.Tech. programmes with adequate opportunity for student and teacher interaction. In these programmes, post-class interaction is facilitated by an effective course management platform. Candidates have to take approved core and elective courses of their choice and can complete the entire M.Tech. programme at their own pace. On completion of each course, a certificate will be awarded, and on finishing the required credits in different categories, the candidate will be eligible for a master's degree. The candidate may also do a set of laboratory experiments and projects as defined by the curriculum. Seven programmes jointly worked out with industries by the concerned departments have been approved by the Senate. The details are given in the table below.

The web-enabled M.Tech (Automotive Technology) course was started in May 2017. Five automotive industries sponsored 29 students for this course in the first year. This was followed by two other courses offered by the Department of Electrical Engineering, namely M.Tech (VLSI) with 27 students and M.Tech (Communication Systems Engineering) with 49 students. The second batch of students joined the M.Tech (Automotive Technology) programme in November 2018. Two more automotive industries sent their candidates for this programme for the second batch. The second batch of students joined the M.Tech (VLSI) and M.Tech (Communication Systems Engineering) programmes in September 2018. A new web-enabled programme, M.Tech (Information Security) was started in September 2018 with 33 students.

List of Senate-approved web-enabled M.Tech programmes for industries		
S. No	Department	Title
1.	Aerospace Engineering	Mathematical Methods for Aerospace Engineers
2.	Aerospace Engineering	Aerodynamics and Aircraft Performance
3.	Computer Science and Engineering	M.Tech in Computer Science and Engineering with specialisation in Information Security



4.	Electrical Engineering	Master's in Communications Systems Engineering
5.	Electrical Engineering	Master's in VLSI
6.	Mechanical Engineering	Automotive Technology
7.	Metallurgical and Materials Engineering	Industrial Metallurgy

	2017	2018	2019	2020	Companies	Total Earnings (amount in Rs.)	Number of Faculty
EE-Comm	40**	44	31		Qualcomm, BEL, ADI, SignalChip, Sankalp, Valeo, Cypress	13.50 crore	18
EE-VLSI	26**	26	23				
CS-Soft Security		28	28	25	Qualcomm, BNY, Cypress, Valeo	4.40 crore	7
ME-Automotive Technology	29	21	15	-	Mahindra, TAFE, FCA, SCL, BOSCH, TVS, Hanon Automotive	2.43 crore	13
ME-Machine Design	-	-	-	21	Mahindra, Daimler, Lam, Siemens Gamesa	42 lakh	

### 6.1.6. Conferences

IIT Madras has instructed faculty members (vide circular No. F.R.150/3/2011 dated 31 March 2011) to register all national and international conferences, workshops, seminars, symposia and other such events organised by them with the CCE. The following programmes were registered with the CCE in 2020-2021:

S. No.	Coordinator	Department	Title	Period	No. of Participants
1	Prof. Ravindra Gettu	Civil Engineering	Online Workshop on Recent Advances in Science and Technology of Concrete	2 May 2020	65
2	Prof. Ravindra Gettu	Civil Engineering	Online Workshop on Resilience of Concrete Construction	23 May 2020	70
3	Prof. B. Ravindran, Dr Gitakrishnan Ramadurai	Computer Science & Engineering Civil Engineering	RBCDSAI's International Summit on Data Science and AI	18-20 June 2020	1010
4	Dr B. Ranjit Kumar Nanda, Dr Sudakar Chandran	Physics	International Conference and Workshop on Evolution of Electronic Structure Theory and Experimental Realization (EESTER), 2020	14-18 December 2020	350
5	Prof. K. Murali, Prof. S.A. Sannasiraj	Ocean Engineering	6th International Conference in Ocean Engineering - ICOE 2021	5-9 July 2021	200
6	Prof. T. Sundarajan, Prof. M.P. Maiya, Prof. B.V.S.S.S. Prasad	Mechanical Engineering	26th National and 4th International ISHMT - ASTFE Heat and Mass Transfer Conference IHMTTC -2021	17-20 December 2021	350
7	Dr Smita Srivastava	Biotechnology	Regulatory Landscape for Biotech Start-ups in India	19-20 November 2021	100

8	Prof. V. Kamakoti, C. Pandu Rangan	Computer Science & Engineering	Virtual over Web	22-30 January 2021	12
9	Prof. V. Jagadeesh Kumar	Electrical Engineering	14th International Conference on Sensing Technology	17-20 January 2021	250
10	Prof. Devendra Jalihal, Prof. Ramaiyan Venkatesh	Electrical Engineering	Joint Indo-Japanese Smart City Conference 2021 (Symposium sponsored by IEEJ and Workshop sponsored by IIT-M)	26-27 March 2021	250
11	Prof. V. Sundar, Prof. S.A. Sannasiraj, Prof. K. Murali	Ocean Engineering	Coastal Information System - Engineering and Management	6 May 2021	130
12	Dr Bhargava Rama Ch., Dr Lelitha Devi	Civil Engineering	Advanced Techniques for Mobility and Congestion Analysis for Indian Cities	26 March 2021	100
13	Prof. S.A. Sannasiraj, Dr M.A. Atmanand, Dr K. Murali, Dr Tata Sudhakar	Ocean Engineering, NIOT	Oceans 22 Chennai	21-24 February 2022	600
14	Prof. R. Velmurugan, Dr Mohammed Asraf Iqbal, Prof. R. Sarathi	Aerospace Engineering Civil Engineering, IIT, Roorkee Electrical Engineering	13th International Symposium on Plasticity and Impact Mechanics	21-26 August 2022	500
<b>Total</b>					<b>3987</b>



## 6.2 Centre for Industrial Consultancy and Sponsored Research

### 6.2.1 Introduction

The Centre for Industrial Consultancy and Sponsored Research (IC&SR) at IIT Madras was set up in 1973 to foster and promote sponsored research activities as well as relationships with industries and other organisations. It facilitates active participation of the faculty in various interactive programmes organised for the benefit of the industries and the institute. The centre also plays a pro-active role in providing

legal support for MoUs with funding agencies, and intellectual property protection and commercialisation. In addition, the centre provides administrative support for carrying out consultancy and sponsored research projects, particularly for project staff recruitment and related establishment activities, maintenance of accounts and funding agencies' compliance such as issuing of UCs and Statement of Accounts, GST, TDS, and purchase of equipment and consumables.

#### Some of the major activities of the centre are:

- Sponsored research programmes
- Consultancy projects: research based, retainer, institutional
- Collaborative projects with organisations and industries in India and foreign countries
- ISRO-IITM Space Technology Cell joint projects and TCS-IITM Programme
- IP protection (patenting) and technology transfer

- Faculty and student entrepreneurship and incubation
- Faculty research enhancement: new faculty initiation and seed grants, exploratory research, support for sustaining research, Institute Research and Development Award
- Maintenance of common research facilities
- Blue Sky and team research initiatives
- Facilitation of international collaborations
- Centres of Excellence in frontier areas

#### Main Functionaries and Permanent Officers

Designations	Names
Dean	Prof. Ravindra Gettu
Associate Dean	Prof. Kamakoti Veezhinathan
Senior Techno Economic Officer	Dr V. Suresh
Deputy Registrar i/c	B. Vijayshankar

#### Research and Innovations Awards received during the year

During the financial year 2020-21, IIT Madras has received following two awards in recognition of its quality research, innovation, entrepreneurship and technology transfer:

1. Atal Ranking of Institutions on Innovation Achievements by Ministry of Education, Government of India: Like last year, IIT Madras was ranked as the No.1 Institute among centrally funded universities in the Atal Ranking of Institutions on Innovation Achievements (ARIIA) by Ministry of Education, Government of India. ARIIA ranks the institutes based on high-quality research, innovation and entrepreneurship development, among others.
2. Most Innovative Institute 2020 (Disruptive Innovations) by Confederation of Indian Industry (CII): IIT Madras was judged as the Most Innovative Institute of the Year 2020 for its disruptive innovations. This award was one of the categories in CII Industrial Innovation Awards 2020 and was bestowed during the 26th DST-CII Technology Summit held virtually on 9 December 2020.

**Funds received for R&D Activities:** IIT Madras received major funding for sponsored projects, consultancy projects and royalty receipts for technology transfer from various funding agencies and organisations. The funds received during 2020-21 are listed below.

R&D Activity	Number of Projects	Received Amount (Rs in lakh)
Sponsored Research Projects	762	322,95
Industrial Consultancy	679	95,24
Research Based Industrial Project (RBIP)	351	81,56
Corporate Social Responsibility (CSR) Projects	85	36,40
Technology Transfer	28	2,37
Total	-	538,52

### 6.2.2 Sponsored Research

In 2020-21, 179 sponsored research projects with a total sanctioned value of Rs.359,25 lakh were approved for the institute by various Government agencies and other organisations, both from India and abroad. For executing these projects, 132 faculty members were involved as Principal Investigators. The details of the sanctioned projects-agency wise (number and sanctioned value) are given below.

#### Details of sponsored research projects sanctioned during 2020-21

S. No.	Funding Agency Name	Number of Projects Sanctioned	Sanctioned Value (Rs in lakh)
1.	Ministry of Education (IoE Projects)	1	20000.00
2.	Science and Engineering Research Board	61	4707.10
3.	Ministry of Electronics and Information Technology	8	3622.30
4.	Department of Science and Technology	31	2705.49
5.	Department of Biotechnology	6	610.82
6.	Coir Board	1	500.00
7.	Defence Research and Development Organisation	8	487.39
8.	Wellcome Trust	2	487.32
9.	Board of Research in Nuclear Sciences	2	366.76
10.	Indo-German Science and Technology Centre	3	348.82
11.	Southern Naval Command, Kochi, Kerala	1	193.64
12.	Indo-French Centre for the Promotion of Advanced Research	6	180.30
13.	Office of the Principal Scientific Adviser	1	180.15
14.	Rajiv Gandhi Centre for Biotechnology	1	150.00
15.	Aeronautics Research and Development Board	1	140.42
16.	National Supercomputing Mission	4	102.52
17.	Madras Rubber Factory	1	100.00
18.	Shanmugha Arts, Science, Technology and Research Academy	1	100.00
19.	Tamil Nadu Health System Reform Program	1	100.00
20.	Vellore Institute of Technology	1	100.00

S. No.	Funding Agency Name	Number of Projects Sanctioned	Sanctioned Value (Rs in lakh)
21.	Indian Space Research Organisation	4	99.64
22.	Department of Health Research (ICMR)	2	83.90
23.	Stryker Global Technology Center Private Limited	1	75.00
24.	National Remote Sensing Centre	1	64.68
25.	UK Research and Innovation	1	49.85
26.	Biotechnology Industry Research Assistance Council	2	45.75
27.	Centre for Development of Advanced Computing	1	38.08
28.	GE Oil and Gas India Private Limited	1	26.81
29.	Council of Scientific and Industrial Research	2	25.34
30.	Tube Investments of India Limited	1	24.00
31.	Ants Innovations Private Limited	1	23.13
32.	LightMotif Automation Sensors Systems Private Limited	1	23.00
33.	Intel Technology India Private Limited	3	22.50
34.	Indian Council of Medical Research	1	21.05
35.	GE India Industrial Private Limited	1	15.00
36.	Indo-US Science and Technology Forum	1	12.50
37.	Department of Atomic Energy	1	12.08
38.	Government of Mizoram	1	12.00
39.	University of Sheffield	1	10.22
40.	Anglo-Ink	1	10.00
41.	Shastri Indo-Canadian Institute	1	10.00
42.	Small Industries Development Bank of India	1	10.00
43.	Indian Council of Social Science and Research	1	8.93
44.	Space Application Centre	1	5.00
45.	Queen Mary University London	1	4.80
46.	Kapindra Precision Engineering Private Limited	1	3.00
47.	Universiteit Stavanger	1	2.72
48.	Indian Institute of Management Bangalore	1	2.00
49.	National Chemical Laboratory	1	1.20
50.	Volkswagen Foundation	1	0.00
<b>Total</b>		<b>179</b>	<b>359,25.21</b>

In 2020-21, 825 sponsored projects were going on (including the projects sanctioned in previous years) with sanctioned value of Rs.2057,77.93 lakh. About 370 faculty members were actively involved in executing these projects.

### 6.2.3 Consultancy Programmes

In 2020-21, 533 consultancy assignments with a value of Rs. 230.09 crore were initiated by the faculty members in the institute. The details are given below:

Details of Consultancy Projects-Type wise		
Type of Consultancy	Number of Projects	Value (Rs in lakh)
Corporate Social Responsibility	49	3157
Institutional Consultancy	335	6009
Research Based Industrial Project	116	11229
Retainer Consultancy	3	183
Internal Testing	5	34
External Testing	5	57
CSR-Additional funds (additional funds sanctioned during 2020-21 for the previously funded CSR projects)	-	648
Additional value (additional funds sanctioned during 2020-21 for the previously funded non-CSR projects)	-	1692
<b>Total</b>	<b>533</b>	<b>23009</b>

About 150 faculty members were actively involved in executing consultancy projects. The total value of the ongoing consultancy projects in 2020-21 is Rs. 43036.36 lakh.

**Corporate Social Responsibility:** Faculty members, as in the past, have undertaken several projects in various research areas under the scheme of Corporate Social Responsibility (CSR) activities, as defined in Schedule VII of the Companies Act 2013. In 2020-21, 49 such projects were undertaken with a total value of Rs.3157 lakh. The details of the CSR projects are given below:

Type of Consultancy	Number of Projects	Value (Rs. in lakh)
Corporate Social Responsibility	49	3157
CSR Additional funds (additional funds sanctioned in 2020-21 for the previously funded CSR projects)		648
<b>Total</b>		<b>3,806</b>

### 6.2.4 New Faculty Scheme

The institute provides funds for new faculty members to initiate research in their area of specialisation at IIT Madras. This funding also helps them prepare and apply for sponsored projects proposals for external research grants and establish their research activities at IIT Madras. This scheme is operated as a project under the Centre for IC&SR. For a proposal, value up to Rs.5 lakh submitted by each new faculty member will be recommended by the Dean, IC&SR to the Director for its approval. In 2020-21, proposals submitted by 11 new faculty members were approved.

In case of proposals requiring special equipment, the institute supports the project with amount up to Rs.30 lakh, on a case-by-case basis based on review. In 2020-21, 14 such projects proposals with a total value of Rs.363 lakh submitted by new faculty members were approved for funding under the New Faculty Seed Grants Scheme.

### 6.2.5. Industrial Associateship Scheme

Industrial Associateship Scheme facilitates industries to access IITM's Central Library resources with a nominal annual payment. It also provides an opportunity for industries to interact with faculty members for their R&D requirements. Sixty-one companies (13 large scale, 35 medium scale and 13 small scale) took membership under this scheme during the financial year 2020-21.

### 6.2.6. Other Programmes

#### ISRO-IITM Space Technology Cell joint projects

Under this association, Indian Space Research Organisation (ISRO) continues to fund research projects at the institute that is of interest to the organisation. In 2020-21, four new projects with a value of Rs.99.64 lakh were initiated by faculty members. In total, there are 18 ongoing projects with a value of Rs.639 lakh under the programme.

#### IGCAR-IITM Cell

In 2020-21, two new projects for a total value of Rs.59.85 lakh were initiated under the programme. At present, the cell has eight ongoing projects with a total value of Rs.236.50 lakh.

#### NIOT-IITM Cell

NIOT-IITM Cell was set up in IIT Madras in 2010-2011 to initiate National Institute of Ocean Technology (NIOT) sponsored research activities at IIT Madras. One previously sanctioned project with a value of Rs.212.48 lakh is ongoing.

#### TCS-IITM Programme

TCS and IIT Madras signed an MoU on 6 October 2015 for five years to undertake research activities of common interests. Under the programme, few projects funded by TCS were completed in the institute. In addition, five funded projects were ongoing. This MoU was recently renewed for further five years, up to 30 September 2025, to facilitate the continuation of research activities. In 2020-21, TCS sanctioned TCS Affiliate Faculty position to Prof. Ravindran Balaraman, Department of Computer Science and Engineering.

### Technologies for social development

IIT Madras has ongoing activities for development and transfer of technologies of immediate relevance to society. These activities are undertaken through the following three schemes:

- (1) Socially Relevant Projects
- (2) Rural Technology Action Group (RuTAG)
- (3) Centre for Social Innovation & Entrepreneurship (CSIE)

A write-up on the activities of the above projects is given in Annexure 1a, b and c of the chapter.

### 6.2.7. Distinguished Visitors to the Centre

Delegations from many organisations visited IIT Madras for discussions on possible collaborative research work. In addition, during the year, few organisations held virtual meetings for research collaborations. Few such organisations are listed below:

- Defence Research and Development Organisation (DRDO)
- Dr Reddy's Laboratories
- Embassy of Brazil
- ISRO
- KPMG
- Larsen & Toubro Limited
- Pfizer
- Saipem India Projects
- Southern Railways
- Tata Consultancy services
- Titan India

### MoUs/Agreements signed

In 2020-21, about 175 MoUs/agreements for research collaborations were signed by IITM with industries and other organisations from India and abroad. Names of few such organisations are given below:

## National organisations

- ABB India Limited
- American Express India Private Limited
- Aquaworks Private Limited
- Bharat Electronics Limited
- Bharat Heavy Electricals Limited
- Biotechnology Industry Research Assistance Council (BIRAC)
- Candence Design Systems India Private Limited
- Capgemini Technology Services India Private Limited
- ClariTrics India Private Limited
- CloudPhysician Healthcare Private Limited
- Daimler India Commercial Vehicles Private Limited
- Data Patterns India Private Limited
- Defence Research and Development Organization
- Deloitte Touche Tohmatsu India LLP
- Department of Biotechnology, Ministry of Science and Technology
- Directorate General of Signal Intelligence Defence Intelligence Agency, Government of India
- Dr Rela Institute and Medical Centre
- Engineers India Limited
- Environment, Forests and Climate Change, Department of Mizoram
- FLSmidth Private Limited
- Gail India Limited
- GE Oil and Gas India Private Limited
- GKM College of Engineering and Technology
- Governments of Punjab and Rajasthan
- Great Lakes E-learning Services Private Limited
- Hindustan Oil Exploration Company Limited
- Hindustan Petroleum Corporation Limited
- Indian Oil Corporation Limited
- Indira Gandhi Centre for Atomic Research
- ITC Limited
- Jio Platforms Limited
- Koremool Technologies LLP
- KPMG
- Larsen & Toubro Limited
- Mahindra & Mahindra
- Mangalam Organics Limited
- Ministry of Railways
- MIOT Hospital Private Limited
- National Health Authority
- National Institute of Ocean Technology
- Navajna Technologies Private Limited
- Oil and Natural Gas Corporation Limited
- Panlingua Language Processing LLP
- Pfizer Healthcare India Private Limited

- Principal Scientific Adviser, Government of India
- PSG Institute of Advanced Studies
- Raina Industries Private Limited
- Renault Nissan Technology and Business Centre Private Limited
- RITES Limited
- Rolls Royce India Private Limited
- Saint-Gobain India Private Limited
- Samsung R&D Institute
- Schaeffler India Private Limited
- Shell India Markets Private Limited
- Siemens Gamesa Renewable Energy
- Southern Railway, Chennai Division
- Sree Chitra Tirunal Institute for Medical Science and Technology
- SRF Limited
- Tamilnadu Health Systems Project, Tamil Nadu Government
- Tata Boeing Aerospace Limited
- Tata Elxsi Limited
- Tech Mahindra Limited
- The Ganga Foundation
- Titan Company India
- Toyota Connected Chennai
- UltraTech Cement Limited
- Unilever Industries Private Limited
- United Spirits Limited
- Welcome Trust
- Wipro GE Healthcare Private Limited

## International Organisations

- Access Health International Inc
- Autonym Pte Limited
- Betonwerk Hentzschel GmbH
- Bright Nation Limited
- California Institute of Technology
- Ecole Polytechnique Federale De Lausanne
- ExxonMobil Research & Engineering Co.
- Google LLC
- International Cancer Genome Consortium
- Maschinenfabrik Reinhausen GmbH
- PETA Science Consortium International
- Potsdam Institute for Climate Impact Research
- Ricovr Health Care Inc
- RWTH Aachen University
- Semtronics Limited
- TB Limited Liability Company of Moscow
- The Jackson Laboratory
- The Open University of Tanzania
- University of East Anglia
- University of Edinburgh
- University of Florida

### 6.2.8 Patents filed and granted details

As in the previous years, many intellectual property (IP) applications were filed by the institute in 2020-21 in the areas of science, engineering and technology. Details of these applications are given below:

IP Applications	Number of Applications Filed
Indian patents applications filed	117
Indian copyrights, trademark and design applications filed	10
PCT and international patent applications filed	68
Total applications filed	195

**Publication of patents:** Approximately, 136 Indian patent applications and 35 international patent applications of the IITM's patent filings were published in 2020-2021.

**Patents granted:** In the financial year 2020-21, 124 Indian patents and five international patents were granted to the institute for the applications filed previously. A brief write-up on IP filing, maintenance and technology commercialisation and related activities are given in a later section.

**Technology Transfer/Royalty:** Many technologies/IPs are being developed in the institute and transferred to industry and other organisations. In 2020-21, an amount of Rs.2.36 crore was received towards technology transfer; a list of some organisations from whom funds were received are given below.

- Cygni Energy Private Limited
- Diamondbay Technologies Private Limited
- GE India Industrial Private Limited
- Genus Power Infrastructures Limited
- iFuture Globistic Enterprise Limited
- Intelizon Energy Private Limited
- Lucas TVS Limited
- Phoenix Medical Systems Private Limited
- Ricovr Healthcare Inc
- Shira Medtech Private Limited
- Ultratech Cement Limited

### 6.2.9 Publications

IIT Madras faculty members published about 2,925 publications in 2020. The publications include journal papers, review papers, conference proceedings, books and book chapters.

### 6.2.10 Research Fund

To promote research activities at IIT Madras, the Board of IC&SR decided to use its corpus to support several new initiatives. A part of the earnings of IC&SR from consultancy projects was invested in term

deposits and the interests earned through them were used to support various schemes such as Exploratory Research Project, New Faculty Initiation Grant, R&D Award and IP Cell activities. From an initial amount of Rs.50 crore, the corpus has been increased to Rs.120 crore.

The broad allocation for expenses for this financial year is as given below:

1. R&D Award: 50% each from Institute Fund and Research Fund.

Three awards of a total value of Rs.105 lakh were awarded.

2. Exploratory research projects: This initiative is to support projects from any faculty who has a "breakthrough" idea and wishes to initiate work without waiting for their proposal to be sanctioned by the funding agency. The scheme gives maximum of Rs.10 lakh for 12 months. For 2020-21, 26 projects of value Rs.217.30 lakh were sanctioned.

3. New Faculty Initiation Grant: This is a start-up grant up to maximum of Rs.5 lakh. National and international travel is permitted for new faculty members under this scheme. It had 11 projects for a total value of Rs.55 lakh in 2020-21.

4. One team project of significance: A proof of concept will be eligible for funding for a period of two years with an initial maximum budget of Rs.200 lakh. The project will be selected through peer review members.

5. Patenting and commercialisation activities by IP Cell: A maximum amount of Rs.50 lakh is earmarked per year.

6. Maintenance of capital equipment and operation of these facilities: Initially, this is supported by IC&SR for a value of Rs.25 lakh, which is to be used for hiring a technical person for maintaining and operating select central research facilities. Maintenance funds for capital equipment will require further steps on the modalities and will be considered in the near future. Twenty projects for a value of Rs.68.12 lakh was sanctioned in 2020-21.



7. Support for sustaining research (SSR) during the pandemic: The economic and social consequences of COVID-19 have resulted in reduced funding for research projects and delay in the release of committed grants, while making it necessary to prolong the project duration, and fund project staff and research scholars during the lockdown, as they would otherwise be left without any income. As a mitigation measure and to support sustaining research (SSR) during the pandemic, it was proposed to provide a few and limited grants from the IC&SR Research Fund. Fifty-five projects for a value of Rs.387.18 lakh were sanctioned in 2020-21.

### 6.2.11 Positive Messaging and Outreach Program

IIT Madras is one of the few high-ranking academic institutions in India that are prompt, active and well connected on social media. Our Facebook page has over 1,95,422 likes and is extremely well updated with a response time of just hours and actively engaging over 54,000 people every week. IIT Madras' tweets have 326K impressions every month on an average. We have noteworthy LinkedIn impressions of 658K. We are also ahead of the curve in our presence across other social media platforms such as Instagram and Google Plus. A monthly e-newsletter is sent to all stakeholders of IITM.

#### Participation in the Expos

##### a) India International Science Festival 2020

IIT Madras participated in the 6th edition of India International Science Festival 2020 organised by the Ministry of Science and Technology, Ministry of Earth Sciences and Ministry of Health and Family Welfare in association with Vijnana Bharati (VIBHA), 22-25 December 2020, in New Delhi virtually. Dr Harsh Vardhan, Union Minister for Science and Technology, Earth Sciences and Health and Family Welfare, inaugurated the event on 22 December 2020.

The IIT Madras stall (virtual) exhibited 22 posters featuring Centres of Excellence, R&D, innovation and entrepreneurship activities of the institute. A three-minute video on IITM (sourced from Dean (ACR)

office) was also exhibited. Executive Connect via Text Chat (WhatsApp) was activated during the event days for visitors' interactions with stall staff.

Around 150 visitors from about 80 organisations/institutions visited the stall. The exhibits were available for viewing and downloading. The technical team led by Dr V. Arumugam, IC&SR, organised and managed the event.

##### b. CII Global Startup Summit

The institute participated in the expo (virtual) CII Global Startup Summit organised by CII from 15 March-15 April 2021. Posters on Centres of Excellence, technology, and general institute information on R&D, innovation and entrepreneurship were displayed at the IIT Madras stall. A video was also showcased. The exhibits were open for viewing and downloading. The technical team led by Dr V. Arumugam, IC&SR organised and managed the event.

### 6.2.12 Common Instrument Facility

In 2020-21, the Common Instrument Facility, with the following six instruments for research use of projects, was established at the New Academic Complex of the institute. Registration for using these facilities is done through Equipment Reservation System portal, <https://ers.iitm.ac.in/webroot/home.php>. The user is charged nominally from project funds.

- Atomic Force Microscopy (AFM)
- Differential Scanning Calorimetry (DSC)
- Scanning Electron Microscopy with EDAX (SEM)
- Thermo Gravimetric Differential Thermal Analyser (TG-DTA)
- X-ray Diffraction (Powder) System (XRD)
- X-ray Fluorescence System (XRF)

### 6.2.13 Other information

- Project information software, TULA has been enhanced with more capabilities for real-time reporting of project accounts.
- IP management software has also been upgraded and automated to keep track of impending deadlines and time-bound activities.



## Socially Relevant Projects

### 1. Publish science books at high school level in regional languages (Telugu and Tamil) and donate them to village school libraries, project number: SP1920613SRPX005028, PI: Dr V Srinivasa Chakravarthy

The objective of the project is to write/translate, publish or procure science books in Telugu and Tamil, and send these copies to 300-500 rural, local-language medium schools.

#### Work on Telugu books

The following books were written, translated by V Srinivasa Chakravarthy. To increase the number and range of titles, we also procured titles of science-related books by another writer. Overall, we have seven titles for this year.

The titles are as follows:

1. *Understanding Sound Through Fun Experiments* - VS Chakravarthy
2. ఆసక్తికర వరయోగల ద్వారా ధృవని ఏమిటి తెలుసుకుందం - (Telugu translation of the above book by P. Vikram Kumar)
3. జీవశాస్త్ర చరిత్ర - Two (*History of Biology* - Part 2, translation of the book of Isaac Asimov by VS Chakravarthy).
4. వీరబాసిన బంతి చోట్టు - by TV Ramakrishna (introducing plant life to children through stories and colourful pictures)
5. వరకృతి నేరవిన వరలు - Biomimicry (Lessons from the Nature) by TV Ramakrishna (a collection of chapters on bio-inspired engineering.) Vijnana Prachuranalu
6. మానస డైరీ (Manasa's Diary) by TV Ramakrishna - Life of an eighth grader, seen from the perspective of a girl named Manasa. It gives a peep into the struggles of a high school girl coping with the stress of school, classmates, family, and society at large.
7. వింతవరణి వరపంచం (Wonders of the Animal World) by TV Ramakrishna; published by Vijnana Prachuranalu.

Copies of the above set of seven books were sent to about 160 schools. The institute planned to send these books to 500 schools.

#### Work on Tamil books

The following books were originally written by Isaac Asimov. These are now being translated into Tamil by a group of enthusiastic Tamil translators from remote locations.

1. How did we find out about - Beginning of Life?
2. How did we find out about - Blood?
3. How did we find out about - Computer?
4. How did we find out about - Dinosaurs?
5. How did we find out about - Earth is round?
6. How did we find out about - Earthquake?
7. How did we find out about - Human roots?
8. How did we find out about - Microwaves?
9. How did we find out about - Pluto?
10. How did we find out about - Universe?

The books were published by Thooral Books, Chennai. Three hundred sets of these books were procured

through this project. All these books will be dispatched to various schools.

### 2. Accelerated composting systems for urban and rural households: Dr Indumathi M Nambi

Assessment of micro composting plants: Microcomposting plants were set up by Chennai Corporation and municipalities for organic waste composting. After site visits to 22 units of Chennai Corporation, the following observations were made and suggestions for improvement are presented.

- The size of the tank is not standardised. The height of the tank is greater than 1.2 meters
- Since the depth makes it difficult for labourers to turn the waste, so no turning happens
- Mostly anaerobic conditions only prevail below the top layers
- No understanding of C/N ratio or what to add to maintain C/N ratio of 25
- The waste is crushed and mixed with jaggery and saw dust and found to have high moisture content. This adds to the cost.
- There is no proper arrangement to drain the leachate. The leachate is found to be leaking from the tanks.

#### Modifications suggested

- Educating the operators about the right mix of ingredients commonly available to maintain C/N ratio
- Low-cost fillers like coir pith and corn cobs/sugarcane refuse can replace saw dust
- The aeration inside the tank must be improved by mechanical methods
- Compost quality should be monitored before packaging
- Leachate should be minimised by drying.
- Proper leachate system should be designed and installed.

### 2. Optimum environmental conditions

Black soldier flies (BSF) are most efficient when the temperature is around 27°C. It is observed that at this temperature larvae, pupa and adults have better longevity. The relative humidity is also an important parameter that decides the survival of eggs as well as adults. Eggs cannot survive in dry conditions as low humidity leads to water loss through egg membranes.

In the case of adults, humid environment is needed to reproduce, so a humidity of 30-90 per cent is required.

**Diet:** The adult BSF fly does not consume any food as it has enough fat stored from the larval stage and only requires water. The diet for larvae includes all types of organic waste at a 40-50 per cent moisture level. The feed should not be a slurry; it needs to be solid with moisture for larvae to travel up and down in the feed source. It acts in a similar way benthic organisms consume food at sediment sites in water bodies, mixing the sediment up and down making them fluffy. The nature of substrate, nutrient composition, texture and moisture content plays a role in which how food is consumed by larvae. Food rich in carbohydrates is preferred to be fed if compost is expected in few days; protein-rich food though can be consumed by larvae it takes more time and sometimes could lead to a reduction in larvae number if the acidity of the substrate increases.

**Rearing of BSF:** Based on the training from the ICAR institute, a set-up comprising a 60-litre bucket padded with mesh to hold substrate and provision for leachate collection was fabricated as shown in figure 2. The set-up consists of a tube placed at a 30-degree angle from inside to the outside of the bucket. This arrangement is to help larvae that have turned to the prepupae stage and searching for a place to remain dormant during the pupa stage. The tube has multiple openings cut for larvae to enter; the tube begins from inside of the bucket and ends at the pupa collection jar where pupa remains dormant. A mesh fabricated with plastic support is placed at the bottom of the bucket on which substrate will be added. The gap between the mesh and the bottom of the bucket is around 10 cm. This gap provides space for excess water in the substrate to be drained and hold. A tap provision is added at the bottom of the bucket to remove and collect this water/leachate.

**Best practice:** To have a successful BSF system, the tray method is strongly suggested. The tray system uses a separate tray for each larvae stage. A larvae stage is decided either based on the size of the larvae or the number of days from the day the egg is hatched. The tray system helps keep track of everyday production and helps segregate larvae and help collect larvae for poultry feeding at the right time and prepupae to nurture to fly stage for further production at the right time.

**Advantages of BSF:** Apart from the fact that it is very helpful in handling the food waste problem, there are several other advantages to BSF. BSF reproduce at a much higher rate and have less lifespan; they are packed with protein-rich fat, which is full of energy; they are easy to farm; they harvest themselves with little effort from us; and their most important advantage is compost production, which is an excellent

fertiliser compared to other forms of compost.

**Conclusion:** The training at the ICAR-National Bureau of Agricultural Insect Resources, Bangalore helped in setting up a BSF unit at the terrace of ED building, IIT Madras. The rigorous training helped us understand the black soldier fly and the way it has to be farmed to treat food waste and generate valuable compost out of it. BSF metamorphosed from larvae to flies in the current set-up by consuming vegetable waste and different types of flour. In the coming days, reproduction and an exponential increase in its population is expected.

**The way forward:** Optimised conditions of mixing and aeration based on lab trials will be adopted in tumbling composter and in-vessel composters after fabrication is complete. Modifications will be suggested while developing a second prototype. Sensors have to be developed and placed in the composter for continuous monitoring.

### 3. HomoSEP: Robot for homogenisation of contents and cleaning of septic tanks: Dr Prabhu Rajagopal

**Executive summary:** This report presents the results of detailed simulations carried out for various subsystems to understand the functionality, reliability, performance and safety of the HomoSEP robot. Developments regarding the HomoSEP robot are presented in this report, the key aspects are: (a) development of a synthetic sludge, (b) novel dual-blade mechanism for better homogenisation. For laboratory trials, the improved HomoSEP robot was tested in a laboratory set-up with synthetic sludge, and superior homogenisation was demonstrated. For mock-up purposes, a quantity of cow dung was procured as a means of mimicking human faecal sludge, and the miniature tank was filled with it; again, an improved HomoSEP robot was tested in a laboratory set-up with synthetic sludge, and superior homogenisation was demonstrated.

**Technical summary:** HomoSEP has three main components, namely the inset (blades, inverted umbrella mechanism), feeder (feeder system, portable system) and control (remote controller, camera, sensors, etc.) modules. Multiple blades (0.3 m in diameter, 0.05 m in thickness) were custom designed by the team for 200 W of power, 5 Nm of torque and 40-60 RPM for homogenising hard sludge with water. Electromechanical actuator with RF system is provided in the inverted umbrella module shaft for opening and closing blades with a load of 38N, with a stroke length of 0.095 m. Telescopic shaft with parallel actuators is provided for the mixing of sludge by blades at high depths of septic tanks capable of holding a load of 347N with a stroke length of 0.2 m. Onboard cameras together with LED lights provide for monitoring the

mixing of tank contents. Rheometer (parallel plate) and Displacement Volume Method is used to measure the viscosity and density of different sludge samples. This test helps us to choose the desired synthetic sludge (psyllium-yeast) for testing in our laboratory. The associated theory and test procedure for our sludge homogenisation with water in a tank with HomoSEP robot experimental studies are explained. The psyllium-yeast and cow dung sludge tests were performed. We find that the multi-pitch blade is capable of mixing viscous fluids like sludge with water while rotating at 60 RPM and 5 Nm of torque. The flow pattern of the fluid mixture is the same for psyllium-yeast and cow dung sludge, but the discrepancy is the time needed for the homogenising mixture. Cow dung sludge is harder than psyllium-yeast sludge, which is why it took more than 15-20 minutes to completely homogenise with water.

**1.b Finite Element Analysis (FEA) simulations of feeding system**

The feeder mechanism is used to provide vertical motion along with the transmission of the torque to the inverted umbrella mechanism. We performed some simulation order to verify the capacity of the

splines to withstand force and torque, convert the total torque acting on the shaft to force, and divide this force evenly on the faces of the splines, as shown below in Figure 2.

Conclusions: The multi-pitch blade is capable of mixing viscous fluids such as sludge with water when rotated at 60 RPM and 5 Nm of torque. The flow pattern of the fluid mixture is the same for psyllium-yeast and cow dung sludge, the only difference being the time required for homogenising the mixture. Cow dung sludge is harder than psyllium-yeast sludge, which is why it took longer than 15-20 minutes to fully homogenise with water.

Conclusions were also drawn from the CFD simulation of the blades. CFD simulation helped the team in designing RPM blades, torque, power and motor selection before it was made. The experimental tests verify the CFD simulation of mixing flow patterns as seen in figure 9 above. Feeding system performs well to achieve mixing at high depths by moving the whole bottom module to 0.3 m and the portable system provides extra height which helps in centering the bottom module with the tank. This is a significant achievement and sets the stage for full-scale field trials that are to be commenced shortly.

**4. Energy Generation Using VAWT-Focus on Incorporating Modular Design And Low-rpm Generation: Dr P Ramu (Engineering Design)**

Objective:

- To build Savonius turbine using modular design concept
- To obtain the relation between wind velocity (m/s) and turbine speed (rpm)
- To obtain the relation between turbine speed (rpm) and torque on the rotor (Nm)

**Design of Savonius turbine**

Projections of assembled Savonius turbine depicted in Figure 1

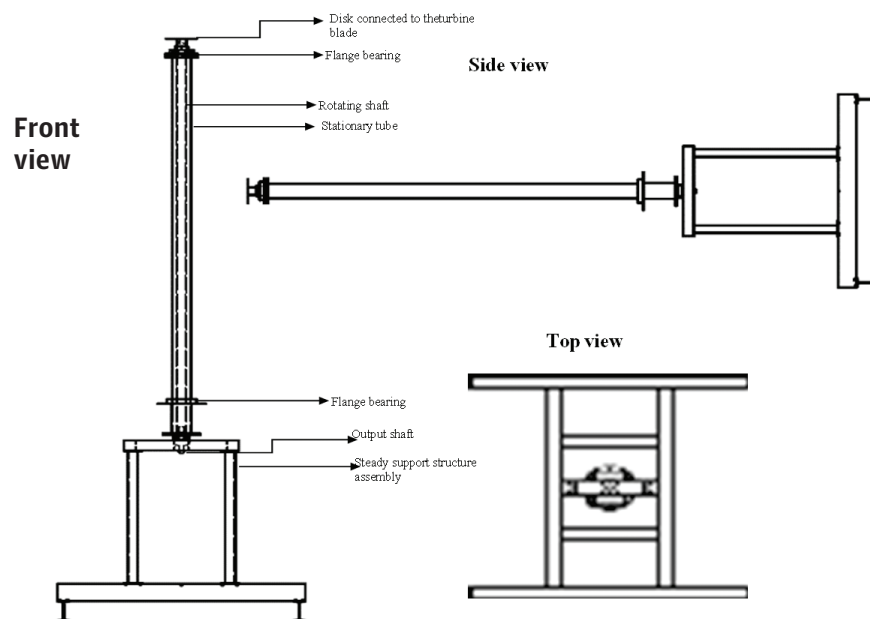


Figure 1. CAD modeling of Savonius turbine assembly



**Machined parts of Savonius turbine**

Some of the machined components of Savonius turbine are shown in Figure 2.

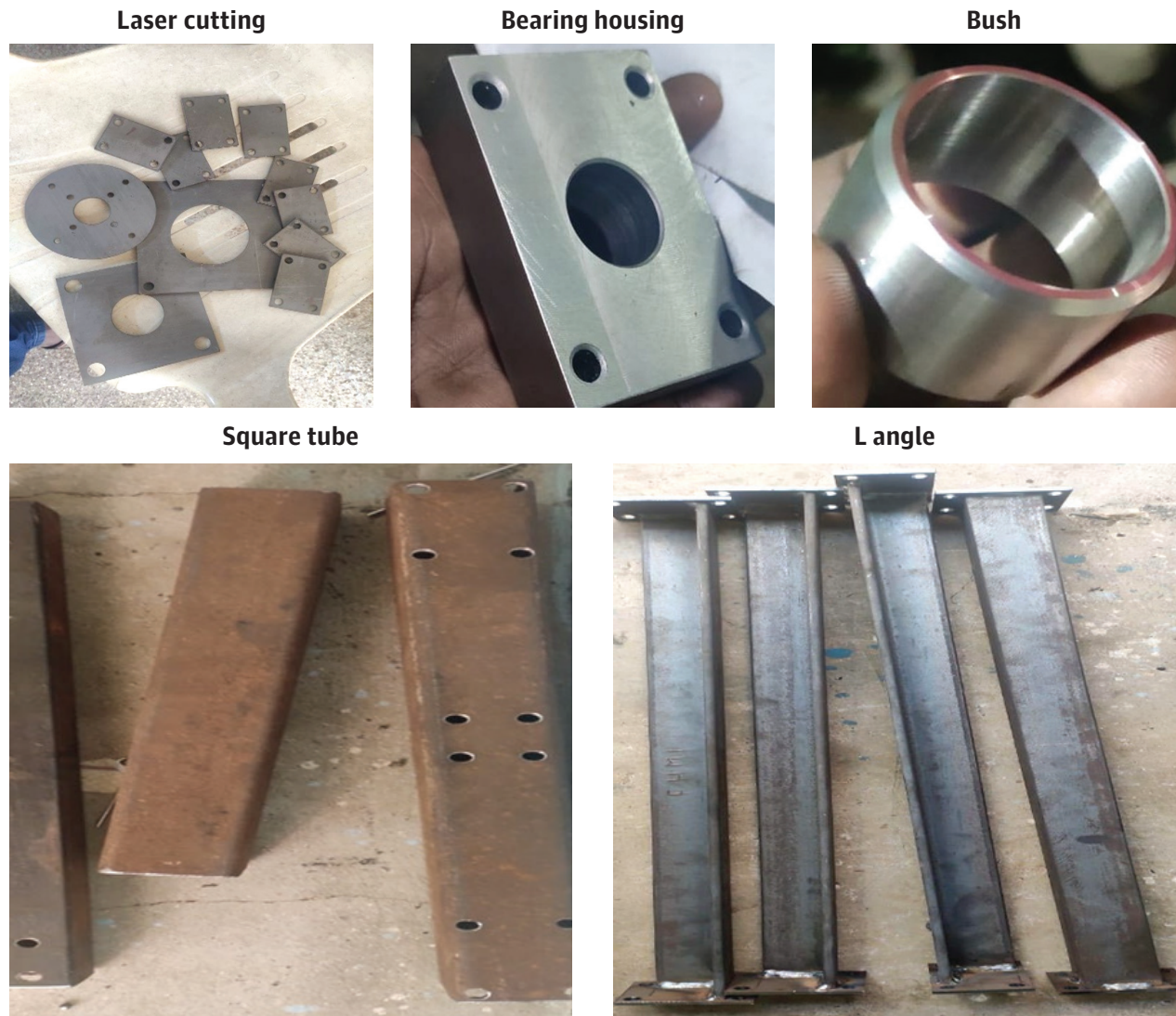


Figure 2. Picture of machined components

**Savonius turbine final assembly**

Assembly without turbine blade



Final Assembly



Figure 3: Final assembly of Savonius turbine

**Data logger:**

- Proximity sensor used to get the rpm of the turbine blade by measuring pulse per rotation.
- Anemometer used to get wind velocity

The data logger was set to measure the wind speed and rotor rpm with a time frequency of 5 second. Once the data was obtained, a regression equation was fit to the data. This equation can be used to find rpm for any wind velocity.

**Theoretical power calculation of turbine rotor**

Theoretical power of turbine rotor is usually calculated using Betz law<sup>1</sup>. Betz power in Watts is expressed in Equation 1.

$$P_s = 1/2 C_p \rho A v^3 = 0.36 h D v^3 \quad (1)$$

Where,  $C_p (=0.593)$  is Betz coefficient,  $\rho (=1.2 \text{ kg/m}^3)$  is density of air,  $A = h D m^2$ ,  $h$  is height of blades,  $D$  is wing spread of rotor, and  $v$  is wind speed

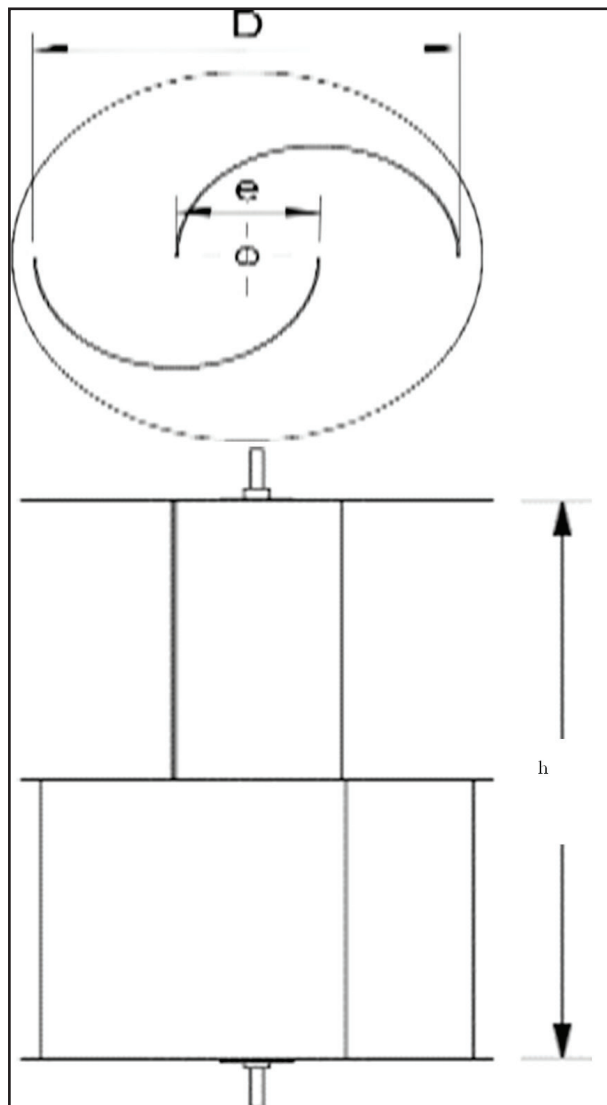
We consider the aerodynamic and mechanical losses to be 50%. Then, the Betz power in Watts is

$$P_s = 0.18 h D v^3 \quad (2)$$

Torque can be expressed as:

$$T_s = P_s / \omega \text{ Nm} \quad (3)$$

Where,  $2\pi N$  is the angular velocity of the rotor,  $N$  is rotor speed. Usually,  $60$ . Theoretically, from the tip speed ratio but here, we use the rpm data directly to compute and the results are presented in Table 3. The current turbine set up is presented in figure 5.  $h = 1.76 \text{ m}$  and  $D = 0.854 \text{ m}$



e=Overlap ratio  
D=Wing spread of rotor  
h=Height of blades

**Figure 5: Basic sketch of Savonius rotor**

[http://kho.unis.no/doc/Savonius\\_windrotor\\_basics.pdf](http://kho.unis.no/doc/Savonius_windrotor_basics.pdf)

## 5. Kidney Exchange – Models and Algorithms:

### Dr Meghana Nasre

Kidney failure, also called End Stage Renal Disease (ESRD) is a condition that is not treatable. Patients with this condition have to resort to either dialysis at regular intervals or undergo a one-time kidney transplant. Much like blood donation, a patient can receive kidney from donors who are “mutually compatible” with him/her. However, when the donor (typically a close relative) is incompatible, one needs to look at another patient-donor incompatible pair and facilitate a kidney exchange.

The current project involves investigating the challenges in kidney exchange and the use of software-based systems to enable certain components. The tasks are divided into three parts-meeting and discussing with nephrologists, investigating the notions of optimality to suit the Indian context, and building a working prototype as a proof of concept.

### Work done till June 2020

We have developed a back-end which allows us to represent patient–donor pairs and their properties in a particular file format called the JSON file format. Using this format, we have implemented known cycle based linear programming algorithms, which give candidate matches for the input data. The implementation has three optimisation parameters and can clear a pool of about 75 patient–donor pairs in reasonable time – we are working on identifying and fixing the bottlenecks to speed this up. However, we do not expect the pool of patient–donor pairs to be huge in practice.

### Work done till March 2021

- The front-end portal along with database implementation has been completed. The portal enables patient–donor pairs to be entered with the data entries being validated. It also allows multiple hospitals to have registered administrators/transplant coordinators. The front-end part of the portal has been developed closely with our consultant nephrologist from Mehta Hospital.
- The portal provides a functionality to find a match for a given patient–donor pair (called as pairwise match) and an overall match (called as global match) based on a selection of criteria. This part uses the backend code developed in the first part of the project and there are a few integration issues that we are ironing out.
- A working prototype can be found at this link. Login and password are: admin1, kep1, respectively. One can view the (dummy) patients' summary using Data → Summary from the portal menus.

### Tasks to be completed in the upcoming months

- Obtain real patient donor data with which we can

test the effectiveness of the scoring functions that we are using. We are working towards it.

- Based on the Indian aspects, fine-tune the scoring functions on the edges which determine the goodness of the match.
- Testing and improving the user interface for the portal, especially for the Match menu.

## 6. A potent, economical, agro-waste based adsorbent filter developed in-house to treat textiles dyeing units' effluents in villages:

### Dr Kannan A.

The objectives of the project were to understand the ground realities in a nearby village where dyeing effluents disposal is a problem. The project was accomplished with the help of an NGO. After analysing the water quality, a methodology had to be developed for pretreating the water before sending it into an adsorbent filter. The adsorbent's capacity for simultaneously taking different dyes had to be estimated and the physicochemical properties of the adsorbent were to be characterised. The aim is to implement the technology in the village and disseminate the application and maintain and reuse the filter. Data collected may be used for scaling up the process.

### At the midterm, the progress of activities is summarised as follows:

- a) Project coordinator (Dr Kannan A), co-coordinator (Dr T. Renganathan) visited Kanchipuram to get first-hand view of the situation. Accompanied by an NGO representative from NEEDS, we visited a typical fabric colouring unit and a dye plant and observed the processes and nature of effluents. We also visited Weavers Service Centre to talk to officials about local problems.
- b) A few common dye samples that were commonly used on textiles were procured at Kanchipuram.
- c) Due to intermittent showers, water sample collection had to be delayed to avoid dilution effects.
- d) The dyes procured were analysed with UV-Vis. We also tested dyes such as acid orange 10, acid blue and reactive orange 16, which are used for colouring textiles.
- e) Simultaneous removal rates with different adsorbents were investigated at different conditions - pH, temperature, initial concentration and different types of activated carbons.
- f) Point of zero charge was also estimated for the adsorbent
- g) Adsorbent capacities for different dyes were measured and suitable isotherms were developed.
- h) A small continuously operating adsorbent filter was developed in-house to study the adsorbent removal capacities for different dyes. It has been made operational and results on breakthrough curve have been collected.



### The plans proposed at the time of submission of midterm report were

- Analyse actual water samples collected from Kanchipuram locality for dissolved ions
- Devise pretreatment operations to remove non-dye related ions from water before treating the dye containing effluents in the filter
- Show videos of the process to sensitise suitable small scale dyeing plant owners in Kanchipuram and discuss possible measures to adopt the technology for their units.

### The progress after the submission of midterm report is as follows:

- Two interns were hired to work on this project (from November 2020)
- For trial runs, IITM water was used for preliminary pretreatment and adsorption studies
- IITM water was found to have low suspended matter
- Surprisingly, chloride ions dissolved in water led to better removal of dyes using activated carbon
- Pretreatment of the wastewater was carried out using alum and poly aluminum chloride flocculants. Both had tremendous effect in reducing the turbidity comprehensively
- Improved activated carbon was generated by acid

treatment of existing activated carbon

g) Batch studies were conducted to test the type of activated carbon on removal of dyes (acid orange and acid blue). Low pH and acid treated carbon led to best performance

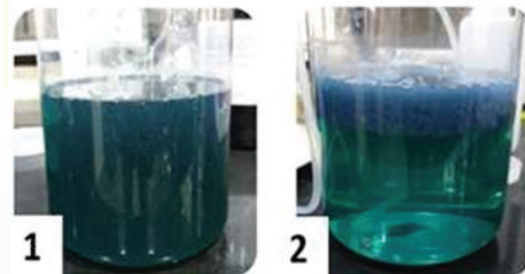
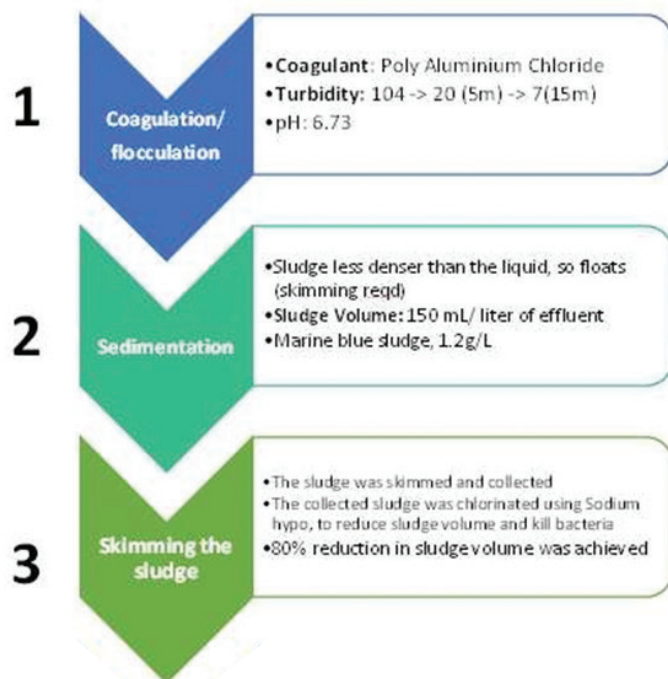
h) Continuous column studies were conducted for single dyes (acid orange and acid blue) as well mixture of these two dyes. Acid-treated carbon had significantly high breakthrough times indicating superior performance

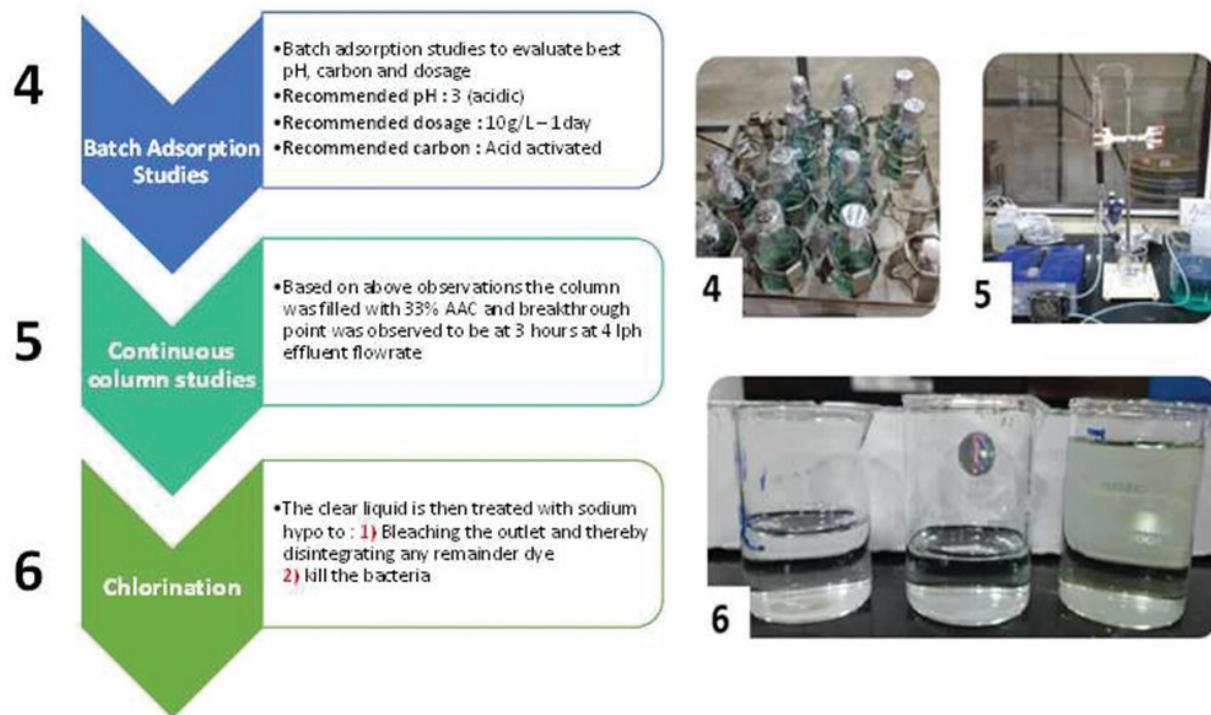
i) Real wastes from Pallavaram tannery wastewater treatment facility and Kanchipuram dyeing unit were collected, the former easily and latter with great difficulty, and analysed for their composition in a standard testing lab.

j) These samples were tested for colour removal using activated carbon, with special emphasis on untreated carbon at natural pH. Since these compounds had a mixture of wastes, UV-Vis method failed and COD analyser was used instead for measuring concentrations.

k) Parallel studies revealed that addition of hypo (NaOCl) substantially reduced the amount of sludge, and the supernatant liquid containing excess chlorine could be used to reduce further the dye and COD in the subsequent adsorption treatment unit. Further addition of hypo was found to substantially reduce the BOD as well.

## WORKFLOW



**Work yet to be done**

- Consultations are in progress with workshop technicians to prepare the water filter cartridge
- A YouTube video will be created at the end of the project



## Rural Technology Action Group, IIT Madras

The major activities of RuTAG during the year 2020-21

### • FICCI - RuTAG Technology Commercialization Program

The Office of the Principal Scientific Advisor (Government of India) and the Federation of Indian Chambers of Commerce & Industry (FICCI) have partnered for the RuTAG Technology Commercialization Program. The objective of the programme is to commercialise a minimum of 10 technologies per year developed by the RuTAG centres located across IITs. Of these, FICCI is mandated to commercialise six technologies within India and four in BIMSTEC and African markets. For the successful implementation of the programme, a strong and close coordination will be required between the RuTAG centres and FICCI. Selected RuTAG technologies were submitted to FICCI expert committee for further evaluation.

### • RuTAG - PALS Projects

The PAN Alumni Leadership Series (PALS) has shortlisted three proposals from their affiliate institutions, which are formulated on the problem statements given by RuTAG IIT Madras, for funding support. The total funding support from PALS is Rs.5.25 lakh. RuTAG will do the part funding of the proposals amounting to Rs.0.88 lakh. The list of projects is given below:

1. Design and development of low-cost solar dryers for vegetables and fruits for rural applications by Rajalakshmi Engineering College
2. Design and fabrication of groundnut pod separator by RAMCO Institute of Technology
3. Implementation of an accurate automatic grading machine by MAMCET

### • Vending Cart Project

A new project proposal formulation has been initiated for developing retrofit solutions for existing fruits and vegetables vending carts. The objective of the project is to develop retrofit solutions for improving the visibility and shelf life of the perishable product without compromising the stability and ergonomics of the cart. The project is led by Prof. Abhijit P Deshpande, Prof. G. Venkatarathnam, Prof. Rajiv Sharma and Prof. Abdus Samad from IIT Madras. The project is being funded by DST SCSP for 12 months.

### • Mango Seed Decorticator

RuTAG initiated a new sub-project on "Design and fabrication of mango seed decorticator" submitted by Prof. Shankar Krishnapillai, Department of Mechanical Engineering

### • Proposal on Honey Adulteration to Sree PVF

Rural Technology Action Group at IIT Madras, along with Dr Nirav Bhatt, Prof. Sridharakumar Narasimhan and Prof. KK Balasubramian, submitted a proposal on "Rapid onsite and offsite testing for honey authentication and quality determination using hand-held and table-top spectrometers" to Sree Padmavaty Venkateswara Foundation (Sree PVF)

### • Technology for Development - The RuTAG Way

**Technology for Development - The RuTAG Way**

WEBINAR  
18 June, 2020

**SPEAKER**  
Mr. Sreenivas Chigullapalli,  
Project Officer, RuTAG, IIT Madras.

**10AM - 11AM**

Organized by  
Department of Mechanical Engineering

<https://meet.google.com/zjk-peoz-irc>

Mr Sreenivas Chigullapalli, Project Officer at RuTAG, IIT Madras presented during a webinar on Technology for Development – The RuTAG Way, organised by the Department of Mechanical Engineering, Rajalakshmi Engineering College, Chennai on 18 June 2020.

### • PALS Workshop

**RuTAG**  
IIT MADRAS

**PALS**  
PAN IIT ALUMNI LEADERSHIP SERIES

*Ideation and  
proposal writing  
workshop*

December 19, 2020  
10:00 - 17:00 hrs

A proposal writing and ideation workshop was organised by RuTAG IIT Madras on 19 December 2020 for the faculty from PALS-affiliated engineering

colleges across Tamil Nadu and MS/PhD scholars from IIT Madras. Around 25 participants were present during the workshop. The workshop was organised with the coordination support from PALS and RuTAG IIT Madras.

• **RuTAG PALS internship for project Crossfire**



Under RuTAG-PALS internship programme, three students from PALS-affiliated institutes worked on the development of an IT-enabled platform for open-source rural technology exchange. The platform offers open-source designs for technologies relevant for rural areas.

• **Team TechConnect participated in GDC I-NCUBATE Cohort 13 at IIT Madras**

The RuTAG IIT Madras team had undergone an eight-week programme, I-NCUBATE Cohort 13, organised by Gopalakrishnan Deshpande Center for Innovation and Entrepreneurship (GDC) at IIT Madras. The cohort's focus was customer discovery, problem-solution fit for each team's idea/intervention. There were a total eight teams in Cohort 13. As part of this cohort, RuTAG conducted customer discovery exercises for an IT-enabled platform for open-source rural technology exchange. The team completed around 60 customer interviews during eight weeks in three states, across four different customer segments (fabricators, design experts, dealers and farmers) in the threshing equipment value chain. The RuTAG team comprised Prof. Abhijit Deshpande (Faculty-in-charge, RuTAG IIT Madras) as faculty lead, Mr Varadharajan K as GDC mentor, Mr Sreenivas Chigullapalli (Project officer, RuTAG IIT Madras) as entrepreneur lead, and Mr Hisham KV (Project Associate), Mr Pradhap R (Project Associate), Ms Nalini K (Project Advisor), and Ms Vijayalakshmi D (Junior Executive) as team members.

• **AARDO e-training on RuTAG technologies**

The RuTAG team participated in an e-training on A Panorama of Affordable Innovative Technologies and Solutions for Rural Development for African-Asian

Rural Development Organization (AARDO) member countries.

• **Potter's training at Pottery CFC at Perumudivakkam**



The RuTAG team along with IOCL SRPL team visited the potter's training programme being conducted at the common facility centre (CFC) developed for the Integrated Pottery Development in Thiruvallur district at Perumudivakkam. Three batches of potters have been trained so far.

**Visit to KSCMMC**

Prof. Shankar Krishnapillai, Department of Mechanical Engineering, IIT Madras visited Kerala State Coir Machinery Manufacturing Company (KSCMMC) Limited for project progress update.



**Figure 1:** Dr.P.Bagavatheeswaran explaining the project to the trainees

**Figure 2:** Trainer explaining the operations of the machines installed in the CFC to the trainees

### Weaver's training at Veeravanallur

The korai grass mat weavers are being given training on how to use Electronic Jacquard Handloom (EJH) for fine korai mat weaving at Veeravanallur. The training programme is being led by Dr S. Ganesan and Mr Hisham KV from RuTAG IIT Madras.

Under funding of Rs.47 lakh received from Tamilnadu Handicrafts Development Corporation Ltd. by RuTAG and CSIE, IITM, RuTAG has established a Common Facility Centre (CFC) with four units of fine mat-weaving electronic jacquard handloom in Pattamadai Fine Mat Weavers' Cooperative Society, Tirunelveli, Tamil Nadu. Two units of fine mat-weaving electronic jacquard handloom developed by Dr S. Ganesan, RuTAG were installed at Veeravanallur in March 2020. To accommodate additional looms at the CFC, a building is being constructed in society premises with the support from the AE office, Pattamadai.

## Centre for Social Innovation and Entrepreneurship

### 1. Introduction

The Centre for Social Innovation and Entrepreneurship (CSIE) at IIT Madras was founded in August 2010 with a focus on teaching and research in the field of social enterprise in India. The centre aims at promoting social entrepreneurship through education, research and dissemination of research output. It has successfully reached out to several high schools, higher educational institutions and social entrepreneurs internationally through various project activities. It undertakes research projects and livelihood improvement projects to build capacities of social entrepreneurs and enrich knowledge in this sector. For all these initiatives, CSIE works closely with institutions, builds partnerships, and helps them build capacities to create awareness, identify and nurture aspiring social entrepreneurs.

### 1.1 Mission

The mission of the centre is to build an environment that will facilitate the creation of social enterprise knowledge through research and empower students to apply their entrepreneurship abilities to develop solutions for greater social impact.

This is achieved by:

- Education. Offering academic programmes on social innovation and entrepreneurship for students across disciplines and degrees at IIT Madras and outside

- Research. Providing an enabling environment for both students and faculty researchers interested in social enterprise research within the IIT campus
- Consultancy and Outreach. Encouraging young innovators and entrepreneurs by assisting in the development of socially beneficial products and ideas
- Collaboration. Creating an ecosystem of social entrepreneurship and extending the same to other technology institutions including IITs

## 1.2 Impact till date

### Education

Five batches of innovation and social entrepreneurship courses; around 200 students from IIT Madras enrolled and about 10 students started enterprises

Four International Summer/Winter Schools on Social Entrepreneurship; 82 students participated

Four certificate courses; over 100 participants enrolled

### Outreach

Five faculty development programmes, one student development programme, eight entrepreneurship awareness camps, three business plan workshops conducted; reached out to more than 55 colleges, 130 faculty and 1,050 students from engineering colleges

Six school camps, 500 students from different schools in Tamil Nadu participated

Six Idea Spark editions, more than 750 students participated, 70 ideas discovered

Involve – a social enterprise based on peer-to-peer learning model for Government schools rendered incubation support

### Research

Nine research papers presented in international conferences and one book chapter published

### Capacity building and livelihood promotion

Strengthened management capacities of 105 Farmer Producer Companies (FPCs) and 22 NGOs through eight capacity building programmes, benefitting 263 farmers and developing eight case studies on Best Practices of FPCs

CSIE has become key organising node for state and national seminars on farmer producer organisations.

Developed social media platform to promote korai mats; result: more than 2,500 followers, two retailers' connects and Rs.3,50,000 worth of sales facilitated through the exhibit space at IIT Madras, international conferences and institutional sales

Established a CFC for Pattamadai korai mats under the Revival of Languishing Crafts initiative by Tamil



Nadu Government

Established a Skill Development Centre at Vellapakkam village under the CSR initiative of Chennai Petroleum Corporation Limited (CPCL), trained 138 youth under the initiative

Established a rural enterprise to manufacture biochar under the Technology Transfer initiative with Shri AMM Murugappa Chettiar Research Centre

### 1.3 COVID-19 impact on activities

CSIE mainly works on ground by constantly visiting work sites, interacting with local people, and conducting events and workshops in and outside of IIT Madras. Due to the pandemic, all the activities have been cancelled and efforts are now to take activities online.

## 2. Activities

### 2.1. Education

Education in the field of social entrepreneurship was identified as one of the primary objectives of CSIE. CSIE believes that by educating students in this field, we are creating a ready source of talent for the sector.

2.1.2 Ministry of Skill Development and Entrepreneurship (MSDE) - UK-India Education and Research Initiative (UKIERI) Social Entrepreneurship Capacity Building

CSIE is actively engaged in UK-India Social Entrepreneurship Education Network (UKISEEN) through University of Southampton. The network is engaged in education promotion activities through conferences, seminars, workshops, competitions and related projects.

CSIE, IIT Madras along with Social Impact Lab at University of Southampton, UK have been working towards Building Social Entrepreneurship Capacity among Technology Graduates. This project was jointly funded by MSDE and UKIERI.

This was being done through capacity building programmes for teachers in technology colleges to develop and implement social entrepreneurship

modules with focus on entrepreneurial skills. Since the onset of COVID, the focus has shifted towards developing online content relevant to social entrepreneurship.

#### Current activities:

- CSIE is currently working on developing online video lectures and related content in the field of Social Entrepreneurship education.
- Six video lectures in association with University of Southampton have been recorded and are in the production stage.

Details: <http://ukiseen.org/msde-ukieri-sept>

### 2.2 Consultancy

CSIE undertakes consultancy assignments to provide business development support for social enterprises (including FPCs) and undertakes impact assessment for philanthropic projects.

#### 2.2.1 Capacity Building of FPCs

Objective: To build capacities of FPCs in way of equipping them to make active role in the agricultural supply chain network. This will enable better management practices and sustainable growth.

#### Activities

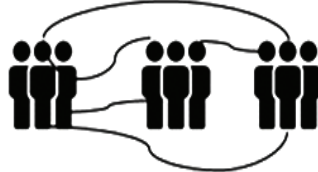
- Conducted network analysis in large FPCs to explore structural relations among members of FPC and across institutions in the ecosystem of FPCs
- Role of various government schemes in rendering livelihood support during pandemic-led lockdowns was mapped to the analysis
- FPCs and local retail markets remain the procurement hubs of farmers produce compared to government-regulated markets
- FPCs supported procurement of major food crops and horticultural produce during lockdowns.

## Methods

### Socio centric analysis

Structural patterns of interactions among FPC members

## Surveys



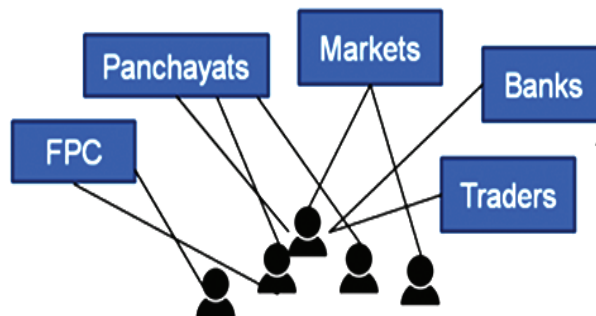
- Members/Farmer friends closely associated
- Activities of association
- Network support during lockdown
- Market information sources

## Tools

Social network analysis

### Egocentric analysis

Focus on single actor/Stakeholder to analyze local pattern of relations



- Activities associated to FPC – General/Lockdown
- Buying & selling avenues of farm produce
- Credit linkages
- Association with local governance

Visualization plots

## 6.3. Central Electronics Centre

### 6.3.1. Introduction

The Central Electronics Centre (CEC) was established in 1971 with the main objective of servicing and maintaining the wide variety of sophisticated electronic equipment at the institute. A key attribute of this centre is a blend of an academic environment and an industry-like working atmosphere.

The centre is housed in a dust-free environment. It has a team of qualified, experienced and talented staff members, trained in India and Germany in various aspects of electronic instrumentation, testing and calibration. The infrastructural facilities and equipment have been continually enhanced over the years using Government of India funds and successive Indo-German collaborative projects.

When the centre was established, in 1971, a critical need for training service engineers for maintaining electronic equipment was foreseen, and an 18-month training programme, the first of its kind in the country, was started in the same year. Later, the period of the training programme was extended to 24 months. In view of the huge demand for trained personnel both within the institute and outside, conducting such long-term training programmes became one of the important activities of the centre.

The centre has diversified its activities and now offers the following services:

- Servicing and maintenance of electronic equipment/instruments
- Training programmes for manpower development
- Calibration of electronic test and measuring instruments
- Testing of electronic products
- Development of custom-built equipment
- Consultancy services to industries in the above-mentioned areas

- Servicing and maintenance of personal computers and printers

So far, the CEC has provided expertise and services in the above-listed areas to more than 230 industries/organisations inside and outside the country. The centre has been playing a key role in the area of renewable energy by conducting training programmes related to solar photovoltaics (SPV). Forty SPV training programmes have been conducted and more than 860 personnel have been trained to date. The project was sponsored by the Indian Renewable Energy Development Agency (IREDA), New Delhi. SPV laboratory (indoor and outdoor) facilities have been established to promote developmental activities in the area. Today, the CEC is active in diverse projects involving SPV technology.

Four special (customised) 12-week training programmes were organised for radio officers of the merchant navy so that they could become Electro-technical Officers. The project was sponsored by the Academy of Maritime Education and Training (AMET), Chennai. As and when requests are received from industries, the centre conducts the short-term training programmes, Calibration Requirements and Uncertainty Calculations as per NABL accreditation ISO 17025:2017.

As the centre has expanded its activities, most of the laboratories have been upgraded. In 2001, the CEC received the ISO 9001 quality certification from RWTÜV, Germany for having established quality systems in its services. The centre also received NABL accreditation in 2004 for testing and calibration laboratories in accordance with ISO/IEC 17025 standards. The ISO and NABL accreditations were actively maintained through adherence to the specified processes and procedures.

### 6.3.2. Staff Training Activities

Training attended by staff members in public sector undertakings

S. No.	Faculty Member	Title	Institution	Period
1.	Pasupula Vishyanth Sukhesh Chandra, ID No. 8909, Junior Technician	Laboratory System and Internal Audit Program as per ISO/IEC 17025:2017	The Training and Capacity Building Cell, Quality Council of India	15-16 April 2021
2.	N. Bharathidasan, ID No. 8195, Junior Technician	Laboratory System and Internal Audit Program as per ISO/IEC 17025:2017	The Training and Capacity Building Cell, Quality Council of India	15-16 April 2021

### 6.3.3. Design and Development Activities

#### New facilities added or major equipment procured

S. No.	Equipment	Value (Rs. in lakh)
1	EMI Receiver (full compliance)	24.99
2	Bi-directional power supply	24.15
3	Broadband power amplifier	9.87
4	Signal generator	5.75

### 6.3.4. Research and Consultancy

#### Industrial consultancy projects (ongoing and new)

S. No.	Faculty Member	Title	Industry	Amount
1	Prof. Bobby George, Head, CEC	Tests on LED PCB and LED driver	M/s Baliga Lighting, Chennai	56,640
2		Tests on LED light fittings	M/s Baliga Lighting, Chennai	14,160
3		Type testing of 24V 5A battery charger	M/s Sanjay Technical Services, Hyderabad	92,040
4		Performance test: Zener diode, thyristor, fusible resistor and capacitor	M/s Samvi Plastic Products, Puducherry	64,800
5		Tests on LED light fittings as per LM79 and IEC 60598	M/s Hyderabad Growth Corridor Limited, Hyderabad	69,115
6		Testing of central control unit model EMC 503 and field call station model PPT 9000 HS-CD (with built-in amplifier)	M/s Elixir Electronics, Chennai	84,960
7		Testing of humidity sensor	M/s Sertel Electronics Private Limited, Chennai	18,880
8		Testing of swivel light	M/s K-Lite Industries, Chennai	1,01,952
9		Tests on LED light fittings as per LM79 and surge	M/s LED's World, Chennai	17,700
10		Measurement of irradiation level of FLP/ WP.LED fixtures as per EN/IEC60079-28, Cl. No.5.2.2 and Table 2	M/s Flexpro Electricals Private Limited, Navasari, Gujarat	1,65,200
11		BIS Testing of 31.5" LED TV	M/s Mr. Light Technology Private Limited, Palakkad, Kerala through the Commissioner of Customs, Cochin under the orders of Hon'ble High Court, Kerala	80,240/-
12		Tests on LED light fittings as per LM79	M/s Panasonic Life Solutions India Private Limited, Chennai	70,800/-
13		Tests on LED light fittings as per LM79	M/s LED's World, Chennai	35,400
14		Testing of silicon wafer	M/s Directorate of Revenue Intelligence	5,900

S. No.	Faculty Member	Title	Industry	Amount	
15	Prof. Bobby George, Head, CEC	Vibration resistance and inclination test on LED fittings	M/s Baliga Lighting Equipments Private Limited	35,000	
16		Class C environmental tests	M/s EMD Electronic Instruments Limited, Chennai (second instalment payment)	4,00,000	
17		Tests on LED light fittings as per LM79	M/s Inventaa LED Lights Private Limited, Chennai	82,936	
18		Testing of PCB and fusible resistor	M/s Samvi Plastic Products, Puducherry	42,480	
19		Tests on LED light fittings as per LM79	M/s Sunshine Electronics and Electricals, Bengaluru	14,160	
20		Impact and vibration tests on indicator, M1360-7	M/s EMD Electronic Instruments Limited, Chennai	15,340	
21		Tests on LED light fittings	M/s LED's World, Chennai	17,700	
22		Tests on LED light fittings as per LM79 and surge	M/s LED's World, Chennai	17,700	
23		ISTMT Test, LM 79, 1k test on LED fittings	M/s K-LITE Industries, Chennai	50,740	
24		ESD Test on anodised Al sample	M/s RV Forms and Gears LLP	11,800	
25		Test on LED fittings and driver	M/s V. K. Sam Engineering, Chennai	1,18,000	
26		Performance test, life test and dry heat test on LED	M/s Samvi Plastic Products, Puducherry	61,880	
27		Tests on LED light fittings as per LM79	M/s Crompton Greaves Consumer Electricals Limited	14,160	
28		Tests on LED light fittings as per LM79 and surge	M/s Aargee Equipments Private Limited	28,320	
29		Tests on LED light fittings as per LM79	M/s Crompton Greaves Consumer Electricals Limited	28,320	
30		Tests on LED light fittings as per LM79	M/s Baliga Lighting Equipments Private Limited	14,160	
31		Tests on LED light fittings as per LM79	M/s Kumaran Group of Companies, Chennai	14,160	
32		Testing of batteries	M/s Gulf Oil Lubricants India Limited, Mumbai	1,11,840	
33		Head, CEC	Tests on LED light fittings as per LM79	M/s Crompton Greaves Consumer Electricals Limited	14,160
34			Troubleshooting and repair of AC power source	M/s Bharat Electronics Limited	75,725
35			LM 79 Test on streetlight (150W)	M/s Sacdeeil Sciences LLP, Puducherry	14,160
36			LM 79, driver efficiency and surge test on LED fittings	M/s V. K. Sam Engineering, Chennai	23,600
37	Testing of potentiometer		M/s Glonix Electronics Private Limited, Anna University Campus, Chennai	1,000	

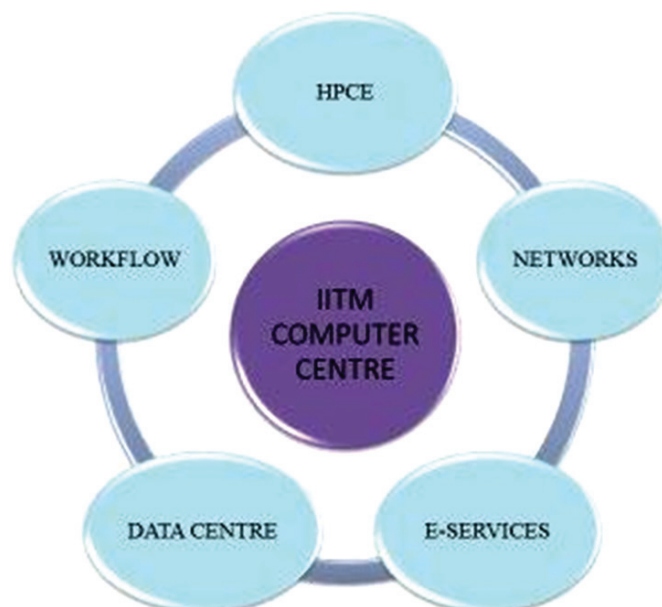


## 6.4 P.G. Senapathy Centre for Computing Resources

### 6.4.1. Introduction

The Computer Centre at IIT Madras was established in 1973 to provide centralised computing resources and support to the academic initiatives of the institute. It has had professionally maintained facilities that have served the IIT Madras community, from the IBM System 370 in the 1970s and the Siemens system in the 1980s to the SGI, IBM power and Sun systems in the earlier part of this millennium and the super-computers and communication and network services of today. Over the years, the computing and information technology requirements of IIT Madras community have increased. The Computer Centre's organisation has also evolved with the increase in requirements. In 2007, the infrastructure of the Centre was significantly upgraded through an endowment given by S. Gopalakrishnan in the name of his father P.G. Senapathy.

The activities of the Centre are organised under five verticals: 1. High-Performance Computing Environment (HPCE), 2. Networks, 3. E-Services, 4. Data Centre and 5. Workflow.



Each vertical is focused on continually improving its services to meet the needs of IIT Madras community. The Computer Centre has been ISO 9000 certified since 1999. The TUV has certified the Computer Centre as an ISO 9001: 2015 standard management system for a period of three years, from February 2017 to January 2020, after conducting the final auditing as per TUV NORD CERT procedures. Currently, it maintains all its processes in conformance with the ISO 9001:2015 standards and is certified along with other units at the institute by TUV Nord. This report presents a background of each vertical and a summary of the annual activities.

### 6.4.2. High-Performance Computing Environment

The High-Performance Computing Environment (HPCE) group was established to cater to the ever-increasing demand for super-computing facilities from researchers at IIT Madras.

A new cluster has been added in the HPCE called Aqua. It is mainly based on a water-cooled system with 280 CPU nodes and 15 GPU nodes and 1PB parallel system, 200TB NAS file system of storage. The following are some active research areas that use the Aqua cluster: aerospace engineering, atmospheric and ocean modeling, analysis of large structures, flows and combustion modeling, material sciences, social, ecological and physical network modeling, numerical weather prediction and data assimilation, molecular modeling, spectroscopy, and VLSI. This machine, which caters to the needs of the research community mostly uses parallel programming.

The detailed system configuration is as below:



#### Total Compute Power:

- 11680 Cores; 30 GPU Accelerators
- 734 TFlops Rmax (1,106 TFlops Rpeak)

#### System Performance:

- CPU - 587 TFlops Rmax (896 TFlops Rpeak)
- GPU - 147 TFlops Rmax (210 TFlops Rpeak)

CPU Nodes/GPU Nodes: The CPU nodes are implemented in a HPE Apollo 2000 Gen10 based solution (2U chassis) with HPE Apollo XL170rGen10 servers. Each node is configured with: Dual Intel Xeon Gold 6248 20-core, 2.5 GHz processors 192GB, 2 TB SATA disk and single-port Mellanox HDR100

HCA per node. The GPU nodes are implemented in a HPE Apollo 2000 Gen10 based solution (2U chassis) with HPE Apollo XL190rGen10 servers. Each node is configured with Dual Intel Xeon Gold 6142 16-core, 2.6 GHz processors 192GB, 2 TB SATA disk, single-port Mellanox HDR100 HCA and 2 x NVidia V100 32GB GPUs - PCIe per node.

Storage Configuration/Cooling System: 1 PetaByte PFS (HPE Lustre Storage) with minimum 25 GB/s write performance and 200 TB NAS storage. The air-cooled liquid chiller units fit with multiples of hermetically sealed SCROLL compressor with four chiller units 36 TR each, seven CRV units and two PAC units.

The HPCE group also maintains machines from various departments and centres. It supports users in improving code and organises training programmes related to the effective use of the facility. This group maintains all commercial software related licenses and implements the 80:20 policy for all commercial software procured by the computer center for HPCE users. Detailed information about HPCE, including the latest usage statistics and the software availability, is posted at the website [www.hpce.iitm.ac.in](http://www.hpce.iitm.ac.in).

### 6.4.3. E-Services: <https://eservices.iitm.ac.in>

The E-Services vertical focuses on services such as Web system configurations, e-mail, Web access, Web security, storage solutions, virtualization and Web services. Several new services were enhanced and added by the group. The services maintained and initiated by the group are listed here:

#### Web services

1. Virtual hosting
2. Mailing list
3. Employee user web portal
4. Websites
5. Shared hosting
6. Moodle online learning platform
7. Posting to campus community portal
8. Online web portals for user registration
9. Online statistics of service usage

#### Security and monitoring services

1. Firewall tuning
2. Hack solution
- 3 Security gateway (spam appliances)
4. Web application firewall (WAF)
5. Log analytics
6. Digital certificate
7. IT Infrastructure monitoring (NAGIOS)
8. Antivirus

#### Storage solution

1. Backup and restore process
2. Disaster recovery
3. Server and desktop consolidation by virtualization

(VMWARE)

4. Hyper converged infrastructure (HCI)

#### User management services

1. Active Directory Service (ADS)
2. Lightweight Directory Access Protocol (LDAP)

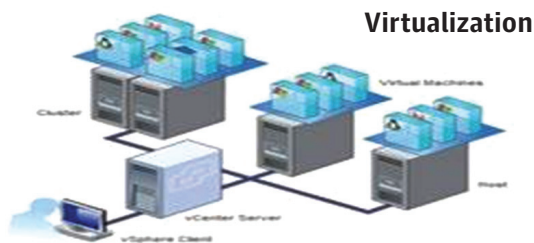
#### Development and deployment services

1. Convocations
2. Distinguished Alumnus Awards
3. User registration for IC&SR
4. HPCE Web-based user management
5. Faculty and staff portal
6. Web-based training
7. VTLs support (Library)
8. Support to students' elections
9. Support to JEE
10. Support to HSEE
11. Support to departments with Web services
12. Support to Office of Alumni Affairs
13. Support to Placement Office
14. Support for conferences
15. Support to ICSR
16. Support to Citrix academic

**Other services**

1. SMS gateway
2. Google API services
3. Intranet services
4. Project management support
5. Online ticketing system
6. Home portal for staff/faculty
7. Cloud services (own cloud)
8. Authenticated mail service
9. Local/global FTP

10. VDI (Virtual Desktop Infrastructure)
11. Resources booking system
12. Microsoft licensing
13. Request tracker
14. MS/PHD online exam through Moodle
15. English O-level exam through Moodle
16. Digital certificates
17. Open virtual desktop infrastructure
18. Google hangouts
19. Online portal registration links

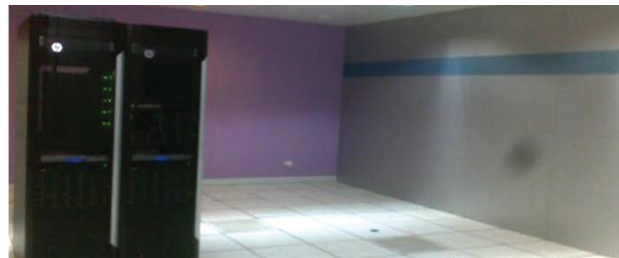


A virtual machine is a software computer that, like a physical computer, runs an operating system and applications. An operating system installed on a virtual machine is called a guest operating system. The virtual machine gets a CPU, memory, video cards, access to storage and network connectivity from the host it runs on.

**VMware server: Before virtualization**



**After virtualization**



**E-Services Server Area in Data Center**



<https://eservices.iitm.ac.in>  
Email Gateway: Sonic WALL  
All incoming mails and outgoing mails go through this appliance.

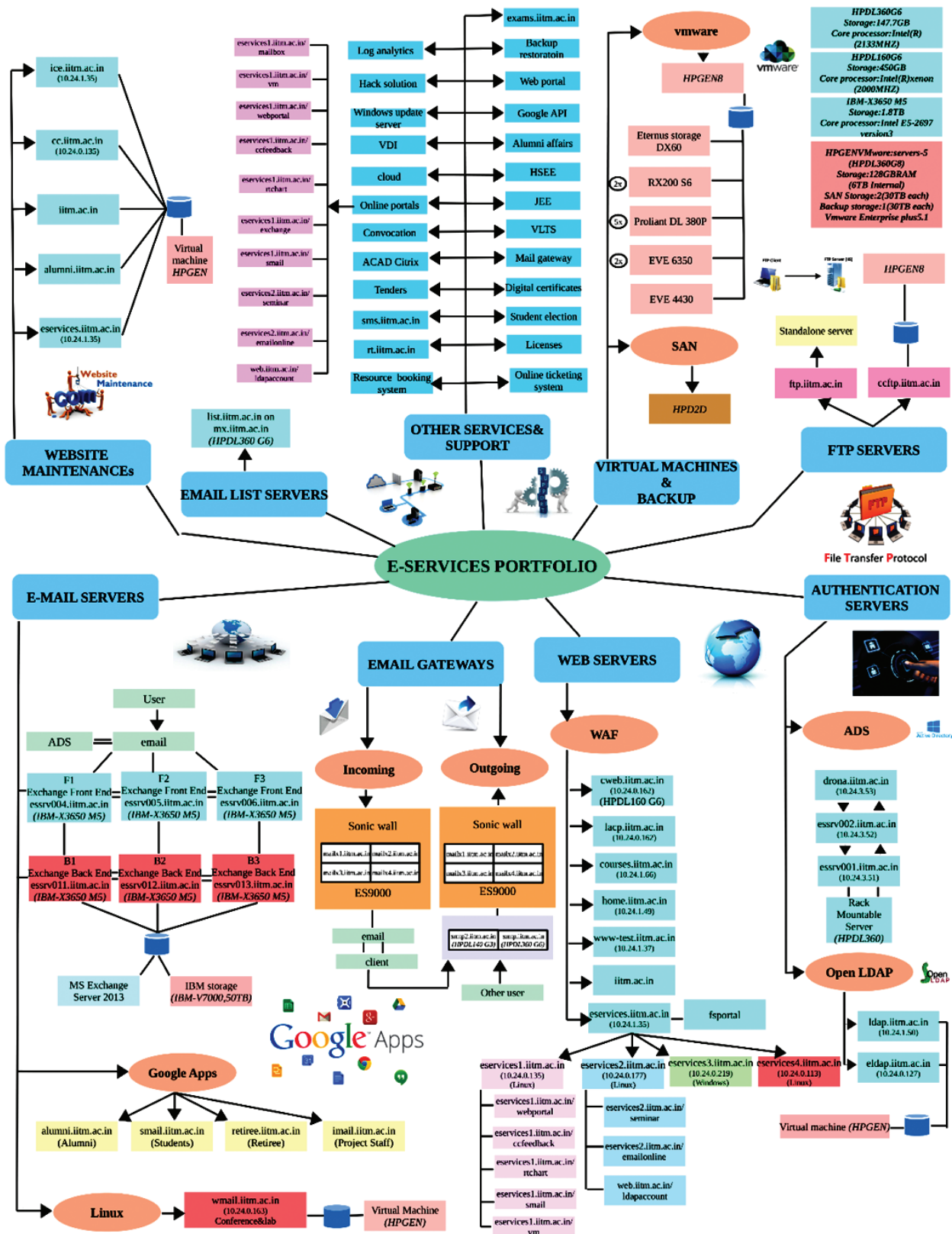


Web Application Firewall: WAF Fortinet 1000 series  
Acts as the firewall for websites



E-services portfolio: <https://eservices.iitm.ac.in>

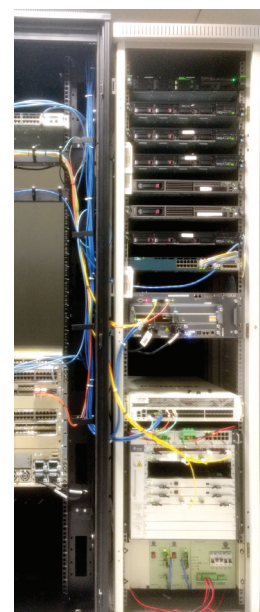




#### 6.4.4. Network

The campus computer network was established in 1994, connecting about 18 buildings in the Academic Zone, using telephone cables. The initial bandwidth was 64 kbps. Today, we have a fiber-backbone high-speed network connectivity of 10 Gbps for all the buildings in the Academic Zone. In addition, a backbone inter-connecting the three zones (Academic Zone, Hostel Zone and Residential Zone) is also operational. The total number of nodes in the campus is approximately 25,000. The network equipment in the Academic Zone was upgraded to provide 100/1000 Mbps connectivity to the nodes. All the buildings in the Academic Zone are provided with dual fiber connectivity. Facilitation for video conferencing, virtual classrooms, webcasting important events, EDUROAM and VPN are also provided under the network service. The network vertical also oversees the procurement of external network services as well as the design, installation and maintenance of the network structure, switches and cabling across the IIT Madras campus. A summary of the key activities of the Network Group for the year under consideration is as follows:

1. Implemented GPON in the Residential Zone.
2. Supported for conducting online examinations and online courses.
3. Supported for webcasting of important institute events.



#### 6.4.5. Data Centre

The function of the Data Centre is to ensure appropriate management of facilities so that all verticals of the Computer Centre function efficiently and without interruptions. These facilities include the uninterrupted power supply, backup power supply (DG set), CCTV, climate control, access control, water leakage system, fire protection under BMS and office space maintenance. The Data Centre operates and maintains the following equipment:

S. No.	Description of Equipment	Capacity	Quantity
1.	Diesel generator set (Caterpillar) with 12 V/200 AH (Exide) - 2 Nos.	600 kVA	2 Nos.
2.	Synchronising panel for parallel operation	3 X 600 kVA	1 No.
3.	UPS (DB) with 12 V/200 AH (batteries) - 96 Nos	160 kVA	2 Nos.
4.	UPS (SOCOMEK) with 12 V/200 AH (batteries) - 60 Nos.	200kVA	2Nos
5.	UPS (SOCOMEK) with 12 V/150 AH (batteries) - 32 Nos.	80 kVA	1 No.
6.	UPS (Emerson) with 12 V/42 AH (batteries) - 34 Nos.	30 kVA	1 Nos.
7.	UPS (DELTA) with 12 V/65 AH (batteries) - 40 Nos.	30 kVA	1 Nos.
8.	UPS (SOCOMEK) with 12 V/200 AH (batteries) - 60 Nos.	20 kVA	1 No.
9.	UPS (DELTA) with 12 V/42 AH (batteries) - 32 Nos.	20 kVA	1 No.
10.	PRAC AC (Blue Star)	17 TR (60 kW)	7 Nos.
11.	PRAC AC (Blue Star)	13.5 TR (48 kW)	2 Nos.
12.	PAK AC (Blue Star)	11 TR	4 Nos.
13.	PAK AC (Blue Star)	5.5 TR	2 Nos.
14.	Ductable split AC (Blue Star)	8.75 TR	2 Nos.
15.	Ductable split AC (Blue Star)	5.5 TR	6 Nos.
16.	RO plant (Excel Water System)	250 LPH	1 No.
17.	Air-cooled type chiller (YORK)	36 TR	4 Nos.
18.	CRV Row Based (Vertiv)	11 TR	6 Nos.
19.	PAC (Vertiv)	10 TR	2 Nos.

## New Building Management Systems

The Data Centre has upgraded the Building Management Systems with the latest technology as follows:

### BMS

1. Enterprise Buildings Integrator (EBI) R430 server
2. CP IPC panel - 1 No. (with IPC controller - 1 No.)
3. CP SPC panel - 3 Nos. (with SPC controller - 8 Nos.)
4. Battery monitoring system for all UPS

### Single Zone (FAAST)

5. VESDA panel for network area (fire alarm aspiration seeing technology)

### Security system

- |                |  |
|----------------|--|
| 6. CCTV Camera | IP-based IR indoor/outdoor (Capture)-27 Nos. |
|                | Sixteen-channel encoder - 2 Nos.             |

### Fire system

- |                      |  |
|----------------------|--|
| 7. Fire alarm system | Intelligent photoelectric smoke detector - 84 Nos. |
|                      | Response indicator - 40 Nos.                       |
|                      | Intelligent heat detector - 2 Nos.                 |
|                      | Temperature sensor - 2 Nos.                        |
|                      | Manual pull station - 4 Nos.                       |
|                      | Hooter - 9 Nos.                                    |
|                      | Isolator module - 3 Nos.                           |
| 8. Fire fighting     | Gas release panel (Ravel) - 2 Nos.                 |

### Door access system

- |                   |                                 |
|-------------------|---------------------------------|
| 9. Access control | TEMA server - 1 No.             |
|                   | Biometric card reader - 4 Nos.  |
|                   | Emergency push switch - 13 Nos. |

### PA system

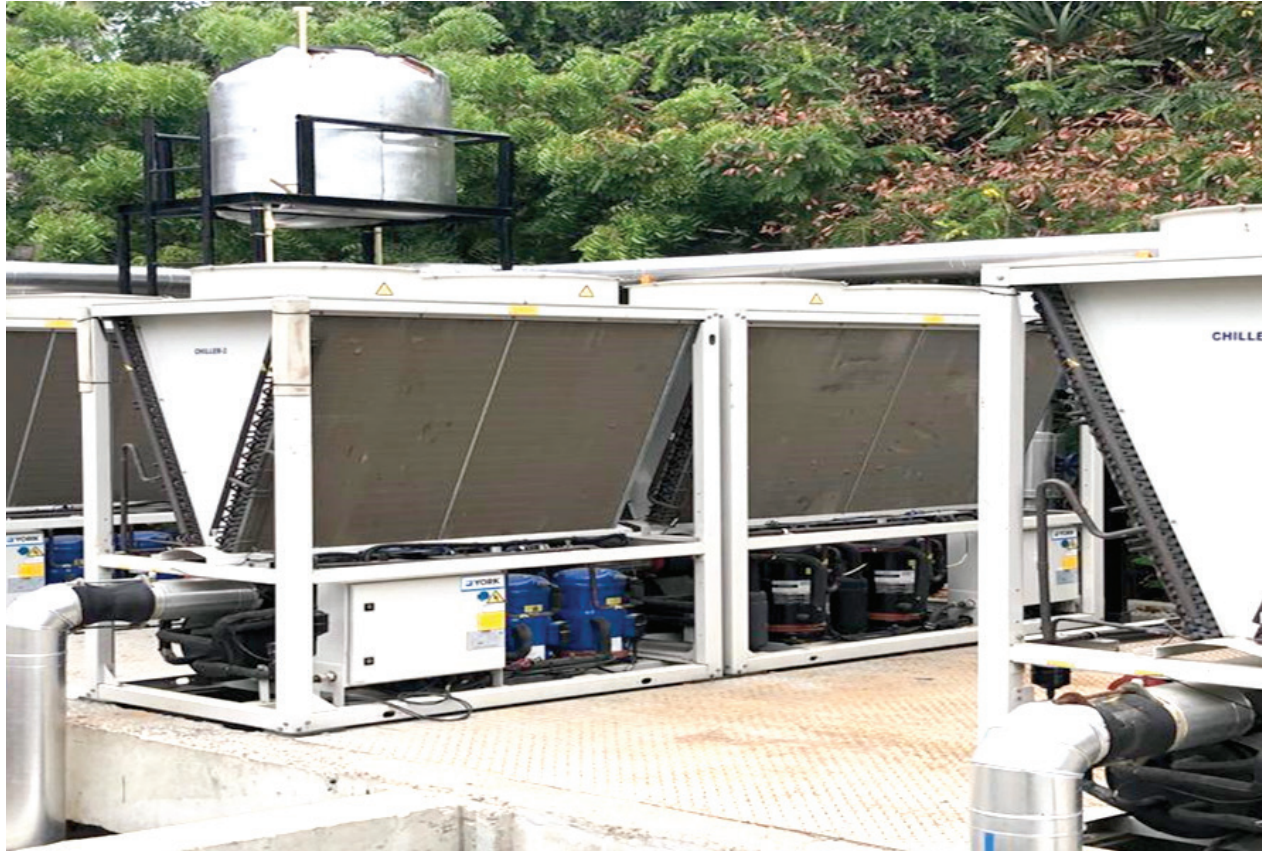
- |    |                               |
|----|-------------------------------|
| 10 | Plena 480 W amplifier (Bosch) |
|----|-------------------------------|

### Infrastructure Development

1. Virgo HPCE cluster and their associated connectivity equipment were removed from Server 2 area.
2. Department servers moved to Server 2 (Virgo) area.
3. 1 number, 36TR New chiller installed for AQUA cluster.
4. 200Ah batteries (60 numbers) replaced for 2\*200 kVA ups systems.
5. 150Ah batteries (32 numbers) replaced for 1\*80 kVA ups system.



## Chiller Units



### 6.4.6. Workflow

The implementation of enterprise resource planning (ERP) software, or what is internally referred to as a Workflow, is done by the Workflow group at the Computer Centre. The group works with various sections in the institute to support system usage and capture changes in requirements involved in process development activities, maintaining reporting websites that collect data from Workflow and generating reports using new software tools.

Online processes have a distinct advantage of transparency, accessibility and analytics. In the financial year 2020-21, we have made major development in enhancing the existing processes in all sections – Administration, Academics, ICSR and Main Stores and Accounts.

Processes such as ICICI payment gateway, NOC process creation, Examiner honorarium, Provisional certificate, Linear grade card for online MTech programme, grade card to storage, all faculty types' access to workflow etc., were introduced. All these processes have tracking system which is Task summary. Task summary screen has been enhanced. The reports are flexible and data can be searched with ease. Like optimised processes, there are SLAs (Service Level Agreements) implemented in various

steps of the process to move them automatically to avoid delay in completing the process and automatic email triggers for each process.

Enhancement to synopsis and thesis evaluation process was carried out. New A5 thesis process has been introduced for scholars.

Along with regular development and optimisation activities, a new portal for web-enabled programmes such as online MTech and EMBA has been created and a trial run carried out in this financial year. This portal enabled the management to design the curriculum for new programmes in flexible periods instead of a rigid semester or quarter system.

Moodle support has been assigned for workflow team this financial year. As soon as the Student Electives Allocation Tool (SEAT) allocation for electives gets completed, the courses are moved to Workflow and then to Moodle. Similarly, immediately after the course add/drop week, the courses are updated in Moodle. All the Moodle service requests, managing the Moodle server and security of the same is taken care by the workflow team.

Like in the previous financial year, the data extracted from workflow have been analysed and utilised by administration to align our internal processes to support our vision for IIT Madras.



**Faculty/Staff members and areas of work**

S. No.	Name	Designation	Area of Focus
1	Prof. P. Sriram	Chairman	Overall coordination and planning
2.	Dr. Rupesh Nasre	Faculty-in-Charge	High-Performance Computing Environment
3	Prof. N.S. Narayanaswamy	Faculty-in-Charge	E-Services
4	Prof. Rahul Ratnakar Marathe	Faculty-in-Charge	Workflow
5	Banavath Baman	TO (Systems)	Training
6	S. Anand Kumar	TO (SS) Systems	Mail domains, mail gateways, server hardware, VMWARE, Web services, virtualization, support services
7	V. Selvaraju	TO (SS) Systems	Network design, servers, switches, campus network maintenance and administration
8	S. Priya	Deputy System Engineer (contract)	Workflow, software development
9	T.V. Subba Rao	Technical Superintendent (System)	Workflow—Administration Module
10	R. Thiruneelagandan	Technical Superintendent (System)	Planning, operations and maintenance of D.G. sets, UPS's, A/c's, BMS, furniture and all data center related equipment
11	P. Gayathri	Technical Superintendent (System)	High-performance computing, system software, installation of Open Source applications and commercial applications, user education development
12	M. Irudayaraj	JTS (System)	Web programming, Linux, E-Services
13	R. Madhanarasan	JTS (System)	Data Centre, BMS and ISO
14	E. Arun	JTS (System)	Workflow
15	P. Mahesh Mithreevan	Senior Technician (system)	Computer networks, servers, switches, campus network, maintenance
16	C. Rajendran	Senior Assistant	Administration

Apart from the permanent staff listed in the foregoing, there are Project Officers, Project Associates and Project Technicians assigned to each vertical in the Computer Centre to support the various activities of the Centre.

## 6.5 Central Facilities

### 6.5.1. Central Workshop Introduction

The Central Workshop (CWS) was established in 1959. Initially, it consisted of shops associated with three major manufacturing processes: metal cutting, metal joining and metal forming. Later, sections on other modern manufacturing processes and control systems were introduced in workshop training. In 2011, Central Workshop facilities were modernised with CNC lathe, Vertical Machining Centre, Advanced Pneumatics and Hydraulic trainers and 3D printers. Central Workshop offers training to all first-year B.Tech students through workshop courses WS1301 and WS1302.

Presently, Central Workshop offers facilities through various shops and sections. The list of shops and sections with their facilities are given below.

S. No.	Shop	Facilities
1	Carpentry	Wood working with planing, circular saw cutting, turning, thickness reducing, polishing processes and hand-operated power tools
2	Fitting and Tool Room	Filing, drilling, tapping, jig boring, tool milling, engraving, marking, slotting, grinding and cutting
3	Machine Shop	Horizontal and vertical milling machines, lathes, planing machine, radial drilling machine, tool and cutter grinder, CNC lathes, CNC milling machines, universal milling machines and Computer Aided Manufacturing software
4	Gear Shop	Spur, helical and bevel gear cutting and gear inspection
5	Electrical Shop	Trainers for single-phase electrical circuits, three-phase direct online and star-delta starter trainers
6	Instrument Shop	Calibration of pressure gauges up to 1000 bar and precision machines, rapid prototyping machines (3D printers)
7	Welding Shop	Arc welding, gas welding, brazing, TIG welding, plasma arc cutting and arc welding simulator
8	Foundry Shop	Sand molding, melting and die casting machines
9	Smithy Shop	Open hearth furnace
<b>Sections</b>		
10	Pneumatics and Hydraulics	Basic and advanced pneumatics trainers, electro-pneumatic trainer, PLC for pneumatics trainer, basic and advanced hydraulic trainers
11	Fiber Reinforced Plastics	Manufacturing polymer reinforced composites by hand lay-up process
12	Plastics	Introduction to plastics, demonstration and production in hand-operated, semi-automatic injection and compression moulding of plastics
13	Instrumentation and Communication Lab	Introduction to basic communication systems, exercises on optical fiber communication, introduction to various kinds of transducers, microprocessor-based control applications, example of stepper motor control and traffic light controller and PLC

## Major activities

### 1. Training of students

The CWS has offered B.Tech/Dual Degree (first year) students of 2020-21 batch workshop courses, WS1301, WS1302 and WS1030 (exclusively for the students of Engineering Design department). The details of the students and training modules are given below.

Department	Number of Students	Training Modules
1. Electrical Engineering	155	1. Power Tools
2. Machining process - Turning	40	2. Machining process - Turning
3. Machining process - Milling	207	3. Machining process - Milling
4. Foundry and Smithy	66	4. Foundry and Smithy
5. Plastics and FRP	70	5. Plastics and FRP
6. Welding	118	6. Welding
7. Electrical	72	7. Electrical
8. Electronics	124	8. Electronics
9. Pneumatics and Hydraulics	39	9. Pneumatics and Hydraulics
10. Instrumentation and Communication	87	10. Instrumentation and Communication
11. Engineering Design	72	
<b>Total</b>	<b>1050</b>	

### 2. Fabrication works and other activities

- The CWS offers support for manufacturing experimental set-ups and their accessories to B.Tech./M.Tech. students and M.S./Ph.D. scholars of the institute. A total of 248 work orders were executed in 2020-2021.
- The CWS has trained 13 institute trainees with ITI, diploma and B.E. qualification. One of them has been trained for maintenance of buses in Auto Shop.
- The Auto Shop of CWS maintains institute buses.
- The CWS staff members actively participate in the product development of IIT Madras incubated start-up companies.

### 3. Contribution to COVID-19 related projects

- Central Workshop supported the prototyping of low-cost ventilators by Healthcare Technology Innovation Centre, Research Park, IIT Madras. The device provides respiratory support to patients using controlled and automated squeezing of a self-inflating or Ambu bag and includes functionalities to control respiratory rate (breaths per minute), tidal volume, pressure parameters, etc. The staff of CWS has put a lot of effort into redesigning and making parts of the prototype using CNC machines and 3D printing.
- The CWS staff members visited and interacted with medical practitioners of Tamil Nadu Medical Council to understand patient isolation intubation box while fixing respiratory tube to COVID-19 patients. The intubation boxes were designed and are being fabricated.
- The CWS has developed and manufactured different versions of foot-operated sanitiser dispensers.
- The CWS has also coordinated to develop touch-free sanitiser dispenser.
- The CWS also facilitated to make disinfection spray, parts of respiratory devices, and fixture face shield transparent sheet drilling, among other products.

### 6.5.2 Central Glass Blowing Section

Established in 1972, the Central Glass Blowing Section (CGBS) is one of the important infrastructural facilities of Indian Institute of Technology Madras. The facility undertakes design and fabrication of sophisticated glass apparatus for research and development in various departments. It has a range of modern glass working equipment that has been largely procured from Germany under a collaborative programme. The apparatus includes a horizontal-cum-vertical lathe, a universal forming lathe and a high-vacuum system. The section is also well equipped with a

good number of sophisticated burners, drilling and cutting machines, grinding and polishing equipment and such other tools necessary for fashioning varied glass apparatus. It has an adequate facility for quartz working and has developed a high level of expertise in this area.

The sophisticated apparatus fabricated includes cryostats, spherical and cylindrical Dewar flasks, logging probes, laser housing tubes with water jackets, reactor tubes, vacuum tube collectors (for solar energy) and quartz ware. From April 2020 to March 2021, the CGBS undertook 520 work orders from various departments.

## 7

## 7. International and Alumni & Corporate Relations

### 7.1. Alumni and Corporate Relation

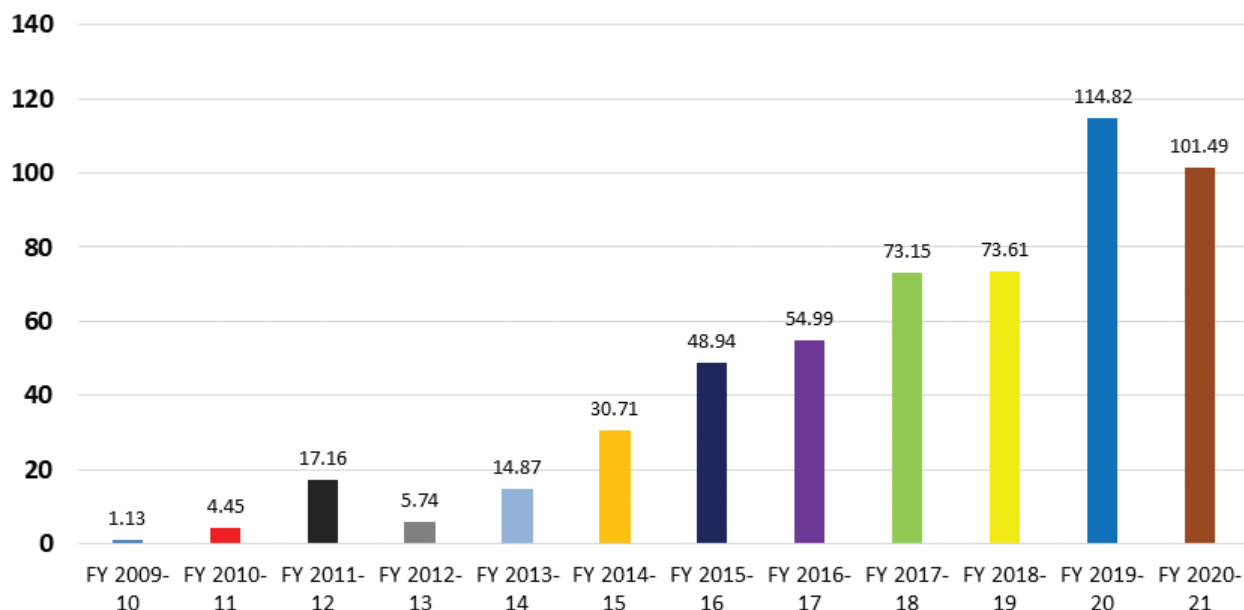
#### Introduction

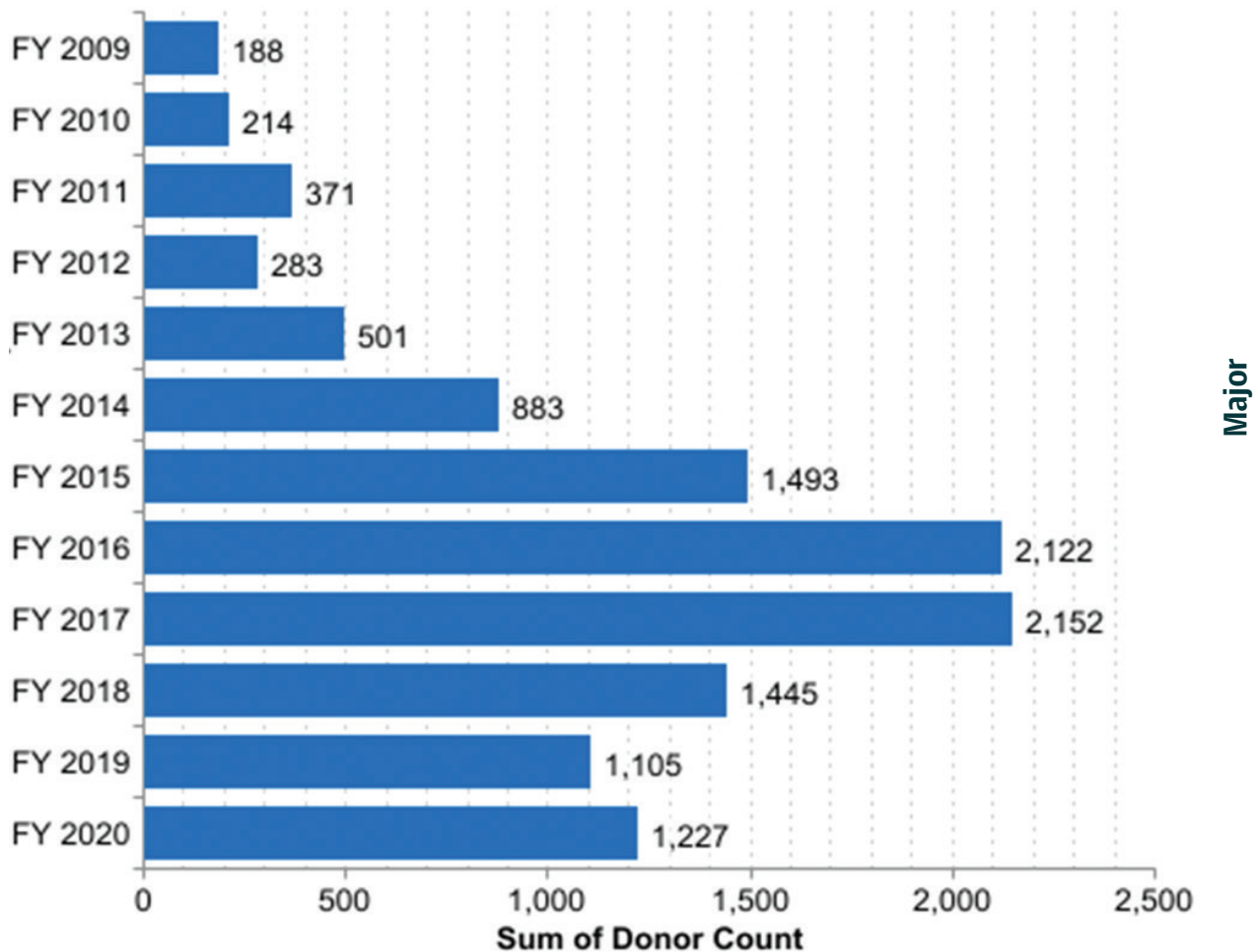
The Office of Dean (Alumni and Corporate Relations) strives to support the institute's drive towards global excellence in education, research, industry relations, innovation and entrepreneurship, sustainability and social impacts and infrastructure. The vision of the Office of A&CR is to enhance the global stature and impact of IIT Madras by leveraging alumni and corporate relations. The mission is to increase engagement with academia/research labs, industry/

business, entrepreneurs and foundations to promote institute-external relations by building on alumni relations and raise funds for the benefit of the institute and its stakeholders, such as students, faculty and staff, and society.

The Dean (A&CR) office and Office of Institutional Advancement raised Rs.101.49 crore for various projects of the institute in financial year 2020-21, thanks to our generous alumni the world over, large-hearted and socially conscious corporates and other well-wishers.

#### Funds received in financial year 2020-21 Year-wise Financial Contribution (Amount in crore of rupees)



**Donors Financial Yearwise****Donations****Corporate Social Responsibility**

IIT Madras is working with industry to help fulfill corporate social responsibility (CSR) obligations. There are four ways that IITM is working with corporates on CSR: support for IITM incubators, support for socially relevant projects lead by IITM faculty, designing R&D programmes with industry, and support through scholarships for economically challenged IITM students.

S. No.	Client	Amount Received (in crores of Rs.)
1	L&T Technology Services Limited	4.15
2	Robert Bosch Engineering and Business Solutions Private Limited	4
3	INDO-MIM	3
4	TTK Prestige Limited	2.84
5	Wells Fargo International	2.09
6	Cookson India Private Limited (MacDermid)	1.94
7	SBI Foundation	1.93
8	Verizon Data Services India Private Limited	1.87
9	Samsung (Value)	1.56
10	Capgemini Technology Services India Limited	1.32

## High Net Worth Individual

S. No	Donor	Amount Received (in crore of Rs.)
1	Arun Swaminathan	7.27
2	Subramonian Shankar	7.01
3	A.M.M. Foundation	4.00
4	Gururaj Deshpande	3.58
5	Pratap Subrahmanyam	2.86
6	Kris Gopalakrishnan	2.82
7	Prakash Arunachalam	1.63
8	Arjun Rao	1.60
9	Krishna S Kolluri	1.43
10	Yashpal Singh Sodhi	1.15

## Distinguished Alumni Awards 2021

The Distinguished Alumnus Award (DAA) is the highest award given to its alumni by IIT Madras, in recognition of the achievements of exceptional merit and excellence. The DAAs are awarded in the areas of entrepreneurship, leadership and management, academia, social and technological innovation, and service to humanity at large. The awards are presented annually since inception in 1996.

The Office of the Alumni Relations receives nominations for the Distinguished Alumnus/Alumna Awards. The call for nominations is circulated by March of the relevant year. The selection is done by a committee appointed by the Director. This year as well, the Selection Committee for DAA 2021 named the following alumni as this year's recipients.



**Office Of Alumni & Corporate Relations, IIT Madras**  
We are delighted to announce the

**Distinguished Alumni Awards for 2021**



**Prof. Jayaraman Chandrasekhar**  
1977/Ph.D/CY  
Principal Research Scientist,  
Gilead Sciences  
Washington, USA

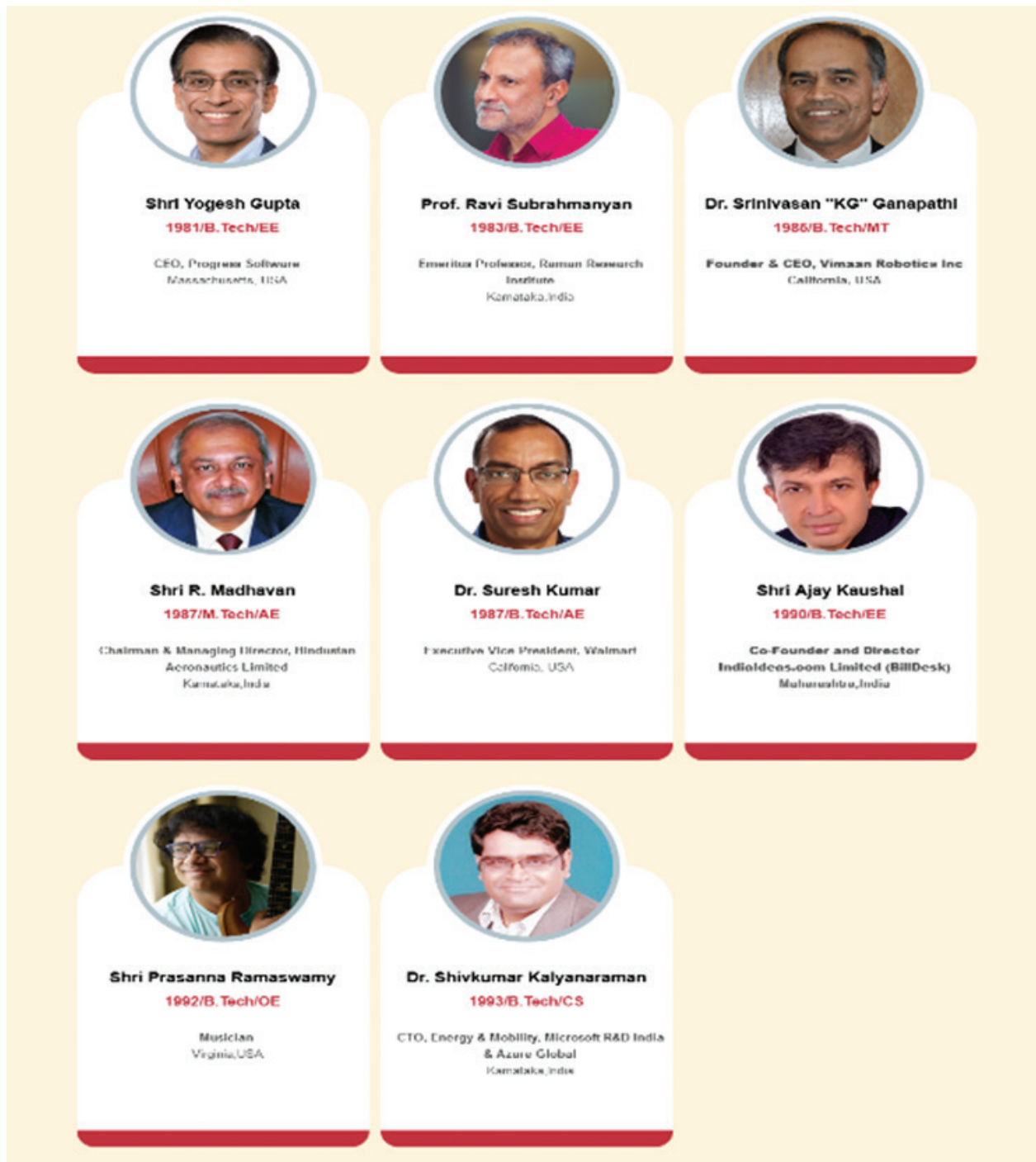


**Dr. Ram Duvvuru Sriram**  
1980/B.Tech/CE  
Chief, Software and Systems Division, ITL @  
National Institute of Standards and  
Technology  
Maryland, USA



**Prof. B.S. Sathyaprakash**  
1981/M.Sc/PH  
Associate Director, Institute for Gravitation  
and the Cosmos, Bert Eickbich Professor of  
Physics & Professor of Astronomy and  
Astrophysics, Pennsylvania State University,  
USA : Professor of Gravitational Physics,  
Cardiff University, UK  
Pennsylvania, USA





## Events

### American Express Data Analytics, Risk & Technology Lab Inauguration

American Express Data Analytics, Risk & Technology Lab was inaugurated on 3 September 2020. AMEX also instituted four awards and multi-year scholarship grants for students at IIT Madras.



### Virtual launch of Prof. K. K. Balasubramanian Chair (4 September 2020)

Professor K. K. Balasubramanian was a dedicated teacher of organic chemistry in IIT Madras. His students and other well-wishers contributed Rs. 1 crore collectively to honour him with an endowment and a special chair called the K. K. Balasubramanian Chair in the Chemistry Department of IIT Madras.



### Inauguration of V.M. Thomas Robotics Research and Teaching Laboratory, 1 February 2021



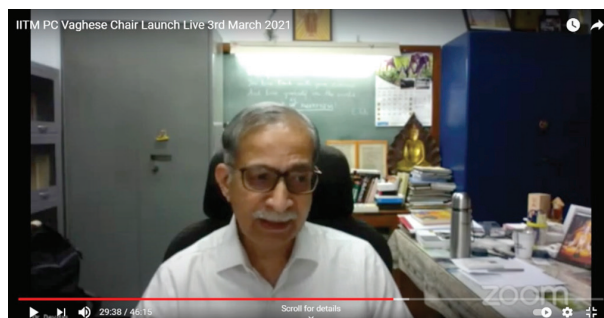
The V.M. Thomas Robotics Research and Teaching Laboratory was inaugurated by Shri V. M. Thomas, Managing Director, Johnson Lifts Private Limited on Monday, 1 February 2021, at the Department of Engineering Design.

V.M. Thomas Robotics Research and Teaching Laboratory was established with a generous contribution from Shri V. M. Thomas, Distinguished Alumnus of IIT Madras, known for his business leadership and acumen, and for his social and ecological commitment.



### Virtual launch of P C Varghese Institute Chair

P C Varghese Institute Chair was launched on 3 March 2021. The Institute Chair has been funded by IIT Madras alumni and well-wishers to honour Prof. P C Varghese. The first Chair occupant of the P. C. Varghese Chair is Prof. Devdas Menon, Civil Engineering department.



### Women Leading IITM

IIT Madras has launched the Women Leading IITM (WLI) programme to boost women leadership in science and technology. The programme will make grants each year to accelerate women technologists' careers as well as provide a supportive environment for women to thrive at IIT Madras. The inaugural grants were issued on 8 March 2021 to mark the International Women's Day celebrations at IIT Madras. The institute is planning to raise \$2 million endowment by the end of 2021, which will provide annual grants to support programmes taken by women students, faculty and researchers. In the first year alone, the Endowment Fund aims to grant Rs. 70 lakh for various initiatives.

## Office of Global Engagement

### 7.2. Introduction

The Office of Global Engagement (OGE) headed by the new Dean (Global Engagement) strives to support the institute's drive towards global excellence in education, research, innovation and internationalisation. Its mission is to develop strong and sustainable international partnerships with research laboratories, academic institutions, industry and entrepreneurs to meet the aspirations of our faculty and student communities.

This year provided for the newly renamed Office of Global

Engagement (OGE) to showcase the dynamic ways in which the OGE has encouraged global engagement at IIT Madras even during the pandemic. Though it was a challenging time globally, the OGE handled the situation in a unique way and came up with new and innovative initiatives to facilitate continued faculty and student engagement with our international partners.

The strategic objectives of the Office of Global Engagement are aligned with the mission and vision of IIT Madras and are delivered by the three verticals working in tandem with each other.

International Collaborations	International Academic Program	International Conference Secretariat
Facilitating collaborations aimed at providing cutting-edge research solutions to international challenges	Providing innovatively taught courses to students in dual formats	Organising high-quality and high-impact conferences that bring together the leading voices from varied fields to a diverse audience
Enabling faculty and student exchanges where research interests converge	Developing a joint targeted master's program with institutes of global standing	Delivering 12 online conferences annually
Delivering multiple co-funded international mobility programmes with partner universities	Delivering online classes with our partner universities	Offering a flipped conference model
Putting together rich, meaningful and exciting online programmes	Leveraging existing programs	Enabling flexible keynote lectures
Extension of faculty and student visits during the semester	Introducing Click and Mortar programs with short physical contact durations which include exams	Moving conference formats to one of an extended discussion session with a maximum time limit
Having virtual faculty on roll at both partner institutes	Enabling joint project guidance	Streamlining conference organisation and assisting faculty in organising webinars, workshops, symposia, and conferences both nationally and internationally
Expanding IITM faculty externships	Increasing the joint programs on offer for post graduate students	Making IITM known for its top-notch online conferences and will lead to capacity building for Indians and the whole world

Encouraging, sustaining, and developing meaningful partnerships with reputed institutions across the globe	Offering exciting opportunities for exchange programs	
Delivering better visibility for research efforts	Providing internships through exclusive programmes like GRIESHMA	
Working as a team with partners to solve more ambitious problem statements	Arming students with the benefits of a culturally diverse experience which empowers them to transcend social and economic boundaries and truly become a world citizen	

### 7.3. Board of Global Engagement

#### Board Global Engagement meetings

	1st Board GE meeting (virtual) was held on 16 July 2020.
	<b>Members:</b>
	20 of the 24 Board GE members were present.
	<b>Agenda items:</b>
	The initiatives of the OGE were presented to the Board members:
1	<ul style="list-style-type: none"> <li>• Prof. Raghunathan Rengaswamy presented the roadmap, introducing the new plans for global engagement</li> <li>• Prof. Sachin Gunthe presented an overview of the international master's program and briefly touched upon the survey conducted by the office to understand the state of international collaboration activities at IIT Madras.</li> <li>• Prof. Karthik Raman presented the International Conference Secretariat to the Board GE.</li> </ul>
	2nd Board GE meeting (virtual) was held on 9 December 2020.
	<b>Members:</b>
	18 of the 24 Board GE members were present.
	<b>Agenda items:</b>
	1. The initiatives of the OGE were presented to the Board members:
2	<ul style="list-style-type: none"> <li>• Prof. Preeti Aghalayam presented an alternative to the existing ASEAN PhD Fellowship Application Process and the increasing collaboration opportunities with French Engineering Schools (FES) that are part of the Federation Gay Lussac (FGL) network for master's students.</li> <li>• Prof. Sachin S. Gunthe presented proposals for enhancing collaborations, the IITM-XXX mobility program, and a new dedicated international mobility program.</li> <li>• Prof. Karthik Raman presented the activities of the international conference secretariat and proposed initiatives.</li> </ul>
	2. A discussion was held after the completion of each presentation by the committee members with key recommendations by the Board.



### 7.3. Visits of International Delegations

Due to the pandemic, OGE hosted fewer international delegations this year. The details of visits are as follows:

Visit by ICCR delegates on 10 December 2020

Indian Council for Cultural Relations (ICCR), the cultural arm of the Ministry of External Affairs, Government of India, is looking after the welfare activities of the international students who come to India for pursuing their higher studies in various universities/colleges all over India. Some of the ICCR scholars are studying at IITM under the Government of India Scholarship schemes administered by the Council.

The delegation consisted of D.S. Rawat, Program Director (Chair), S.S. Latwal, Assistant and K. Mohamed Ibrahim Khaleel, Regional Officer, ICCR Chennai. The purpose of the visit was to discuss ICCR's international students' welfare and programmes. During the visit, the ICCR delegates had meeting with Prof. Raghunathan Rengaswamy, Dean GE and an ICCR student at IITM.



#### Visit by the Brazilian delegation on 1 March 2021

IIT Madras welcomed H.E. Marcos Pontes, Minister of Science, Technology and Innovation, along with a distinguished delegation from Brazil on 1 March 2021. They met with Prof. Ravindra Gettu, Dean ICSR, Prof. Raghunathan Rengaswamy, Dean Global Engagement and Prof. Sachin S Gunthe, Associate Professor, Civil Engineering, to exchange views on themes of common interest and explore avenues for collaboration. The meeting was followed by a visit to the IITM Research Park.

The delegation consisted of H.E Marcos Cesar Pontes, Minister of Science Technology and Innovation, Mr Paulo César Rezende de Carvalho Alvim, Secretary of Entrepreneurship and Innovation of the Ministry of Science, Technology and Innovation, Ms Christiane Gonçalves Corrêa, Secretary of Coordination and Promotion of Science of the Ministry of Science, Technology and Innovation, Mr Darcton Policarpo Damião, Under Secretary of Associated Units of the

Ministry of Science, Technology and Innovation, and former head of Brazil's National Institute for Space Research, Mr Carlos Augusto Teixeira de Moura, President of the Brazilian Space Agency, Mr Clezio Marcos de Nardin, Director of Brazil's National Institute for Space Research, Mr Bernardo Sylvio Milano Netto, Head of the International Advisory of the Ministry of Science, Technology and Innovation, Mr Carlos Rogério Antunes da Silva, Head of the Communication Department of the Ministry of Science, Technology and Innovation, and Ms Roberta Maria Lima Ferreira, Head of Science, Technology and Innovation at the Embassy of Brazil in New Delhi.

#### Visit by the Australian Consul General to South India on 4 March 2021

The Australian Consul General to South India, Ms Sarah Kirlaw along with Mr Michael Costa, Deputy Consul General, visited IIT Madras on 4 March 2021. Ms Sarah Kirlaw, Australia's Consul General to South India, Mr Michael Costa, Deputy Consul General and Ms Janaki Sreeram, Education Outreach Officer and DAP Administrator were the delegates. The purpose of the visit was to understand the existing and growing linkages with Australian institutes, learn how best they could be supportive of our initiatives and advise some of the other avenues of growing partnerships with IITM. During the visit, the Australian delegates met with the Director Prof. Bhaskar Ramamurthi and Prof. Raghunathan, Dean Global Engagement to discuss the collaborations between IITM and Australian Institutions.

#### At IITM Research Park the delegates had the following meetings:

- ❖ Meeting and interaction with the faculty-in-charge of IITMRP Prof. Ashok Jhunjunwala
- ❖ Overview of Research Park by Ms Reema Saha, Head Sales and Marketing, IITMRP
- ❖ Overview of Centre for Battery Engineering and Electric Vehicles (CBEEV) by Mr Karthik B, Business Associate, CBEEV
- ❖ Overview of Incubation Cell and introduce start-ups by Dr Muthu Singaram, CEO, Healthcare Technology Innovation Centre (HTIC) - IIT Madras
- ❖ Interaction with start-up Solinas Integrity by Ms Divya Suresh, Incubator Liaison Officer





#### 7.4. Self-reliant India: Discussions and Dialogues for Humane Innovations

To commemorate the 150th birth anniversary of Mahatma Gandhi, the Self-reliant India: Discussions and Dialogues for Humane Innovations (SIDDHI) webinar series was launched by IIT Madras. It is a dialogue platform where the concepts and ideas propagated by Mahatma Gandhi, such as *swaraj*

– self-reliance, self-sufficiency, self-governance, and the equitable and inclusive development of all sections of India, are discussed. SIDDHI aims to understand India's current needs and ideate solutions for a better tomorrow.

SIDDHI focuses on how technology can play a constructive role in providing solutions to problems afflicting urban and rural India and to create a platform to bring together experts, the public and stakeholders. It aims to create synergies for transforming India by bringing academia-industry experts, policymakers, NGOs, social entrepreneurs, think tanks and public on a single platform.

SIDDHI is a collaborative endeavour with faculty, researchers and students involved with projects sponsored by the Government of India under SPARC, VAJRA and socially relevant projects approved by the Government of India such as the Unnat Bharat Abhiyan and the New India Internship. The webinar series is coordinated by the Office of Global Engagement, IIT Madras. With these objectives, SIDDHI has conducted around 18 webinars as given below.

S.No.	Date	Topic	No. of Attendees	Speaker(s)/ Panelist(s)	Moderator(s)
Event 1	14 August 2020	Food Security: Retrospect and Prospect	217	Mr P. V. S. Suryakumar, Deputy Managing Director, NABARD, Mumbai; Dr R. V. Bhavani, MSSRF, Chennai; Mr Clifton D' Rozario, Advocate at Manthan Law, Bengaluru	Mr A. V. Balasubramanian, Centre for Indian Knowledge Systems (CIKS)
Event 2	21 August 2020	Gandhi in the 21st century	126	Mr Birad Rajaram Yajnrik, digital curator and author from India	Prof. Sanjay Mathur, University of Cologne, Germany, and Prof. Ravi Kumar N. V., IITM
Event 3	27 August 2020	Halfdan Mahler in India 1951-61: High Modernist Planning, Social Medicine and the Road to Alma-Ata	109	Dr Niels Brimnes, Aarhus University, Denmark	Prof. V. R. Muraleedharan, IITM
Event 4	18 September 2020	Emerging Trends in Smart Manufacturing	121	Prof. Steven Ratchev, University of Nottingham, UK; Dr R. K. Amit, DoMS, IIT Madras; Prof. Kulwant Pawar, University of Nottingham, UK; Prof. R. P. Sundarraj, DoMS, IIT Madras	Dr U. Chandrasekhar, Program Director, Addwize, Wipro 3D, Bengaluru

S.No.	Date	Topic	No. of Attendees	Speaker(s)/ Panelist(s)	Moderator(s)
Event 5	1 October 2020	Universal Health Cover at (UHC) in India: Where are we and the way forward	145	Dr Rajani Ved, Executive Director, National Health Systems Resources Centre (NHSRC); Prof Dileep Mavlankar, Director, Indian Institute of Public Health, Gandhinagar (India's first public health university); Dr Girija Vaidyanathan (IAS Retd.), former Chief Secretary, served twice as Secretary HFW, Tamil Nadu	Prof. V. R. Muraleedharan, Department of Humanities and Social Sciences, IIT Madras
Event 6	2 October 2020	Designed for Independence: Enhancing Quality of Life for Persons with Disability	159	Prof. Sujatha Srinivasan, Professor in Mechanical Engineering and Head of the TTK Center for Rehabilitation Research and Device Development (R2D2), IIT Madras; Mr Swostik Sourav Dash, Co-founder and CEO, Neo Motion Assistive Solutions Private Limited; Mr S. Vaidyanathan, Co-founder and CEO, Touch REHAB and IIM Bangalore Distinguished Alumnus Awardee	V R Ferose, Senior Vice President, Head of SAP Academy for Engineering, SAP SE
Event 7	3 October 2020	Wastewater management in the 21st century	219	Prof. George Tchobanoglous, Emeritus Professor, Department of Environmental and Civil Engineering, University of California, Davis	Prof. Indumathi Manivannan Nambi, Department of Civil Engineering, IIT Madras
Event 8	4 October 2020	Sustainable water and waste management in villages	169	Prof. Ligy Philip, Institute Chair Professor, IIT Madras; Prof. B.S. Murty, Institute Chair Professor, IIT Madras	Dr Sudarsan Padmanabhan



S.No.	Date	Topic	No. of Attendees	Speaker(s)/ Panelist(s)	Moderator(s)
Event 9	16 October 2020	Building-integrated cooling system for the hot and humid climate	50	Dr Bruno Lee, Assistant Professor in Building, Civil and Environmental Engineering, Concordia University, Canada; Mr Nima Bonyadi, PhD student and Research Assistant in Building, Civil and Environmental Engineering at Concordia University, Canada	Prof. Srinivas Reddy K, Prof. of Mechanical Engineering at IIT Madras and Honorary Professor, University of Exeter, UK
Event 10	19 November 2020	Panel discussion on teaching writing virtually	197	Ms Nancy Zafris, Former Fiction Editor, Kenyon Review, USA; Ms Geeta Kothari, Non-Fiction Editor, Kenyon Review, USA; Dr Chris Gillen, Professor, Kenyon College, USA; Dr Wendy Singer, Professor, Kenyon College, USA; Dr David Lynn, Professor, Kenyon College, USA; Dr Arunn	Dr Sudarsan Padmanabhan
Event 11	13 December 2020	The Write Thoughts	67	Dr Arunn Narasimhan, Professor, Department of Mechanical Engineering, IIT Madras	Dr Sudarsan Padmanabhan
Event 12	8 January 2021	Case Study of the Grade K-12 Graduate Fellows Project	90	Dr Rajesh Ganesan, Associate Professor, Systems Engineering and Operations Research, George Mason University, Fairfax, VA, USA	Dr Sudarsan Padmanabhan
Event 13	9 January 2021	Fluid Thinking: What Differentiates Those Who Change the Course of Human History	104	Dr Ashish Jaiswal, Associate Fellow at the Oxford Centre for Higher Education Policy Studies, UK	Dr Sudarsan Padmanabhan
Event 14	10 January 2021	Mentoring in "Nation Building"		Dr Pijush Ghosh, Associate Professor, Department of Applied Mechanics, IIT Madras	Dr Sudarsan Padmanabhan

S.No.	Date	Topic	No. of Attendees	Speaker(s)/ Panelist(s)	Moderator(s)
Event 15	26 January 2021	Gandhi and Cities: Challenges of Affordable and Sustainable Growth		Dr Sunita Narain, Director General of Centre for Science and Environment	Prof. Sudhir Chella Rajan, Professor, Department of Humanities and Social Sciences, IIT Madras
Event 16	28 February 2021	Interdisciplinary Research for Maternal and Child Health - from Bench to Bedside and Back		Prof. Shinjini Bhatnagar, Dean, Translational Health Science and Technology Institute	Dr Himanshu Sinha, Associate Professor, Department of Biotechnology, Indian Institute of Technology - Madras, Chennai
Event 17	12 March 2021	The Southern Revolt, 1806		Prof. K.A. Manikumar, formerly Professor of History, Manonmaniam Sundaranar University, Tirunelveli	Prof. Jyotirmaya Tripathy, Professor & Head, Department of Humanities and Social Sciences, IIT Madras

### SIDDHI Speakers



## A panorama of affordable innovative technologies and solutions for rural development

One of the achievements of SIDDHI is an e-training programme conducted for AARDO (African Asian Rural Development Organization) from 22 March-April 2021. The objective of this e-training programme was to showcase the selected technologies developed at IIT Madras, with a special focus on technologies for the rural areas and their livelihoods (farm and non-farm), access to value chains and markets. The opportunities

and challenges in the technology development and dissemination of selected technologies were discussed during the training programme. The participants were from around 30 Asian and African countries where these rural technologies are needed most. In this e-training programme around 16 experts introduced 20 technologies, which were either developed by them or developed in collaboration with others.

S.No.	Date	Topic	Speaker(s)/Panelist(s)	Moderator(s)
1	22 March 2021	Innovative Technology for Sustainable Food Production (post-harvest technology) - value addition	Dr Shankar Krishnapillai, Professor, Department of Mechanical Engineering, IIT Madras, Chennai	Dr Abhijit P. Deshpande, Professor, Department of Chemical Engineering, IIT, Madras, Chennai
2	23 March 2021	Technologies Enhancing Productivity of Small Farmers	Dr Satyanarayanan R. Chakravarthy, Professor, Department of Aerospace Engineering, IIT Madras, Chennai; Dr Sridharakumar Narasimhan, Professor, Department of Chemical Engineering, IIT Madras, Chennai	Dr Palaniappan Ramu, Associate Professor, Department of Engineering Design, IIT Madras, Chennai
3	24 March 2021	Technologies Facilitating Access to Value Chains and Markets	Dr Satyanarayanan Seshadri, Associate Professor, Department of Applied Mechanics, IIT Madras, Chennai; Major Ved Sharma, Co-founder and CEO, Gratitude Farms Private Limited	Mr Sreenivas Chigullapalli, Project Officer, RuTAG, IIT Madras, Chennai
4	25 March 2021	Technologies Supporting Financial Inclusion	Mr S. S. Bhat, CEO, Friends of Women's World Banking (FWWB), Ahmedabad; Mr K. Kalyanasundaram, Programme Leader, DHAN Foundation, Madurai; Dr K. Vijayalakshmi, CEO, Sempulam Sustainable Solutions, Chennai	Mr A. V. Balasubramaniam, Director, Centre for Indian Knowledge Systems, Chennai
5	29 March 2021	Policies and Initiatives Conducive to Development and Transfer of Technologies from Lab to Farm (transfer of technologies from lab to farm to set up micro-enterprises)	Dr J. V. Rao, CEO, Textile Sector Skill Council (TSC), New Delhi	Mr Kannan Lakshminarayanan, Professor of Practice, Department of Engineering Design, IIT Madras, Chennai
6	30 March 2021	Technologies Facilitating Collectivization, Bulk Purchase of Inputs and Traceability	Dr Nagesh Kolagani, Senior Consultant, Tamil Nadu e-Governance Agency, Chennai (Alumni, IIT Madras, Chennai)	Dr Abhijit P. Deshpande, Professor, Department of Chemical Engineering, IIT, Madras, Chennai

S.No.	Date	Topic	Speaker(s)/Panelist(s)	Moderator(s)
7	31 March 2021	Intellectual Property Right (IPR) and Technology Transfer	Prof. Ravindra Gettu, Dean - Centre for Industrial Consultancy and Sponsored Research, IIT Madras, Chennai; Prof. T. S. Natarajan, Dean - IIT Tirupati (Retired Professor, IIT Madras, Chennai); Dr Anant Raheja, Director, FIB-SOL Life Technologies Private Limited, Chennai; Dr Kavitha Sairam, Director, FIB-SOL Life Technologies Private Limited, Chennai	Dr T. S. Chandra, Emeritus Professor, Department of Biotechnology, IIT Madras, Chennai
8	1 April 2021	Developing Institutions for Rural Technologies	Mr Ranjith Mukundan, CEO and Co-founder, Stellapps Technologies (IIT Madras Research Park, Chennai)	Dr Krishan Kant Sharma, Chief Scientist, Shri AMM Murugappa Chettair Research Institute, Taramani, Chennai

### AARDO Speakers





## 7.5. Conference Secretariat

At the Conference Secretariat, Office of Global Engagement we streamline conference/workshop/seminar organisation and, thus, improve the outcomes.

During the pandemic, we organised conferences and workshops virtually through Zoom and MS Teams. The below table gives a summary of the events conducted through the Conference Secretariat.

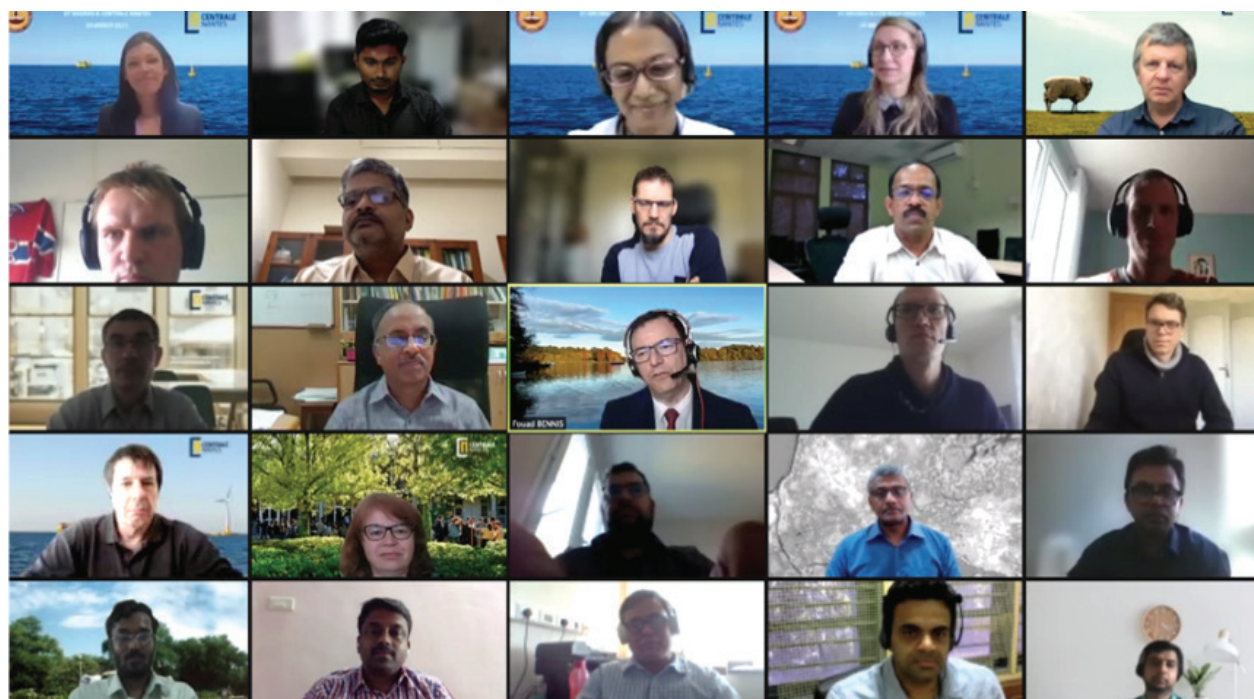
S. No.	Date	Event Title	Event Type	Duration (in hours)	About the Event
1	27-28 November 2020	Regulatory Landscape for Biotech start-ups	Zoom webinar	12	Two-days' webinar on "Regulatory Landscape for Biotech Start-ups in India" organised by IITM Bio-incubator in collaboration with Entrepreneurship Development and Innovation Institute (EDII). The webinar focused on the overall process from drug development to successful marketing.
2	13-18 December 2020	Kenyon Workshop (5 hours per day)	Zoom meeting	25	A five-day writing workshop offered by scholars, who teach writing at the Kenyon Review Writers' workshop at Kenyon College, Gambier, Ohio, USA and faculty from IIT Madras, who are creative writers but specialise in varied fields such as engineering, biotechnology, humanities and social sciences.
3	18 December 2020	Webinar Series on "1st Meeting: Perspectives on the Use of Research Gate"	Zoom webinar	1	The aim of this webinar was the facilitation of professional development through social media engagement.
4	12 January 2021	IBSE 8th Workshop	Zoom webinar	1	These workshops have led to greater awareness of Centre for Integrative Biology and Systems medicine (IBSE) activities and have initiated fruitful advanced discussions on collaborations between IBSE and other IIT Madras faculty.
5	9 February 2021	IBSE 7th Colloquium on "Analyzing the human microbiome for trends, biomarkers, interventions and integration"	Zoom webinar	2	These research seminars help researchers to appreciate the vast expansive field of system biology and omics data analyses and acquaint themselves with novel and cutting-edge research.
6	13 February 2021	9th RBCDSAI Workshop on 'Spotlight on premier papers'	Zoom webinar	3.5	In this workshop, six speakers talked about the cutting-edge research happening in the field of Data Science and AI. This edition of the workshop featured premier papers from RBCDSAI at top conferences and journals.
7	26 February 2021	Global Bio-India Road Show 2021	Zoom webinar	2	Experts spoke about Emerging opportunities for Indian start-ups in industrial biotechnology
8	26-28 March 2021	Chem Plus	Zoom meeting	20	Chem Plus 2021 was organised by the Department of Chemical Engineering, IIT Madras in association with Chemical Engineering Society (ChES) and AIChE Students chapter, IITM. Chem Plus emphasised the significant role that the creation and manufacturing of materials plays in daily life.

## 7.6. Strategic Partnership and Joint Workshops

Strategic partnership and joint workshops were organised by OGE to facilitate faculty collaboration. The workshops were organised on virtual platforms where the faculty from partner institutions and IITM came together to discuss and present their research.

Details of the virtual workshops are as follows

S. No	Date	Partner University	Topics	Participants from IITM	Participants from Partner University
1	13 August 2020	Tel Aviv University, Israel	Quantum Technologies	13	12
2	26 August 2020	University of Alberta, Canada	Artificial Intelligence, Data Science, Humanities	13	10
3	26 June 2020	Heritage Network (European and Indian Universities Network information session)	The Indian grading system, The Indian University ranking system	5	5
4	16 September 2020	Michigan State University, USA	Biomedical Engineering	5	5
5	22 November 2020	Kungl Tekniska Hogskolan (KTH), Sweden	Machine Learning over Networks; High performance VLSI Design and Computer Architectures; Vehicle Dynamics; AI & ML	4	4
6	2 December 2020	Queensland University of Technology Australia	Data Science, Robotics, Materials Science, other areas	16	16
7	15-16 March 2021	University of Sydney, Australia	Sensing and Medical Devices, Bioengineering	11	11
8	30 April 2021	École Centrale de Nantes, France	Marine Technology, Hydrodynamics, Fluid Mechanics Materials, Structures and Processes/Computational Mechanics/Advanced Manufacturing/Civil Engineering; Robotics, Processes and Calculation, that can be extended to Signal and Control	16	13



*École Centrale de Nantes-IIT Madras Strategic Partnership and Joint Workshop*

### 7.7. E- GRIESHMA (Global Research Internships in Engineering Science Humanities Management)

Indian Institute of Technology Madras has taken one of its key programmes to attract international students for research internships completely online to overcome the travel restrictions caused by the COVID-19 pandemic.

Global Research Internships in Engineering Science Humanities and Management (GRIESHMA) was launched in 2019 by the Office of Global Engagement, IIT Madras, to attract research scholars from global universities and offered international students six to eight weeks of paid internship at IIT Madras.

Converted now to 'e-GRIESHMA,' this research internship programme is being offered completely online. International students in the final year of their undergraduate or postgraduate degree can undertake a virtual internship in a research area of their interest under the supervision of an IIT Madras faculty. This programme is being coordinated through the Office of Global Engagement at IIT Madras.

IITM hosted three students for e-GREISHMA and five students for GREISHMA

### 7.8. Special 16 Online Series on "Careers in Germany-for IITM Masters and PhD students" embedded in the strategic partnership between IIT Madras and RWTH Aachen University Indo-German

### Partnership programme funded by DAAD from September-December.

#### Concept

- ❖ **Goal:** Further development of this strategically relevant topic for Indo-German relations
- ❖ **Target group:** IIT Madras Masters and PhD students and postdoctoral researchers with a high potential to start a career in Germany
- ❖ Focus on careers in science, industry and entrepreneurship
- ❖ Series of 16 online events as a response to the global pandemic
- ❖ **Funding:** Combination of DAAD-funding and resources of RWTH and IIT Madras

#### Content

- ❖ Practical training and advice on career paths between India and Germany
- ❖ Information on RWTH Aachen and the German research funding landscape
- ❖ Special features of the German labour market including legal and financial aspects, career planning, job searches, application procedures and job interview preparation
- ❖ Professional consultation by HR expert Jana Köhler, Meetra, Berlin
- ❖ Talks by representatives of science funding organisations and inspirational speakers from the RWTH and IIT Madras ecosystem

#### Achievements

- ❖ Transfer of skills and knowledge to career



- ❖ planning; 100 participants from IIT Madras
- ❖ Enhanced knowledge on the German labour market amongst target group
- ❖ Platform for science funding agencies (DFG, AvH Foundation) to pass on relevant information on funding opportunities
- ❖ Visibility for RWTH: ITA, IAM, RWTH Innovation, OWI Science for Fuels, Career Centre
- ❖ RWTH-alumni in India involved and additional networks formed
- ❖ New event format created, offering potential for further development with more partners

**7.9. Webinar: Variation of Open Access journals and ways to select the right one, 2 November 2020**

The OGE jointly hosted a webinar with IES research solutions on “Variation of Open Access journals and ways to select the right one” on 2 November 2020. In this session, IES shared the characteristics of

different Open Access journals and how researchers can decide where to publish by optimising the impact factor and article processing charge (APC), together with other criteria. The webinar was conducted by Ms Hanwen Chang, Research Analytics Consultant and Mr KC Tang, a dynamic digital marketer with an in-depth knowledge in science communication.

**7.10. Webinar: Boosting Your Research Visibility, Accessibility, and Impact, 20 November 2020**

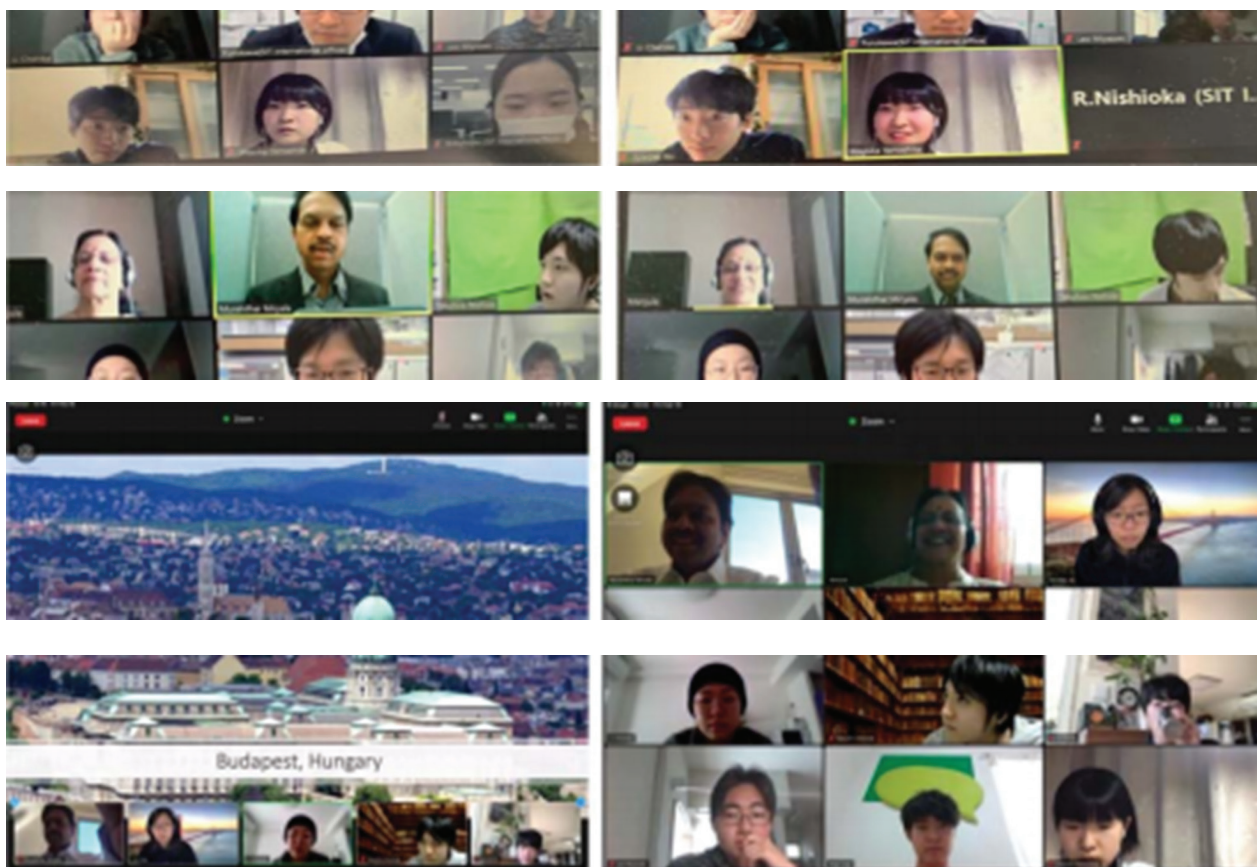
The OGE hosted a webinar jointly with Typeset company on “Boosting your Research Visibility, Accessibility, and Impact” on 20 November 2020.

Three key learning outcomes from the webinar:

- ❖ Understanding publisher copyrights
- ❖ How to utilise the power of self-archiving to boost readership
- ❖ Understanding how academic search engines work

**7.11. The Virtual Engineering English program, Shibaura Institute of Technology, Japan-IITM, 8-19 February 2021**

The online Engineering English program was held from 8-19 February 2021. Eight students attended the programme. The challenges of a virtual English class are varied, but it must be said that the sessions went very well, and students not only honed their language skills, but also improved their confidence in speaking.



## 7.12. Institute of Eminence Scheme (IoE)

### New Centre of Excellence (CoE) Initiatives

- A total of 97 proposals were received for two-phase funding
- **Phase I:** Two years, to demonstrate capability to build into global-scale Centre of Excellence
- **Phase 2:** Three years, for a subset of the Phase 1 initiatives

A total of 362 faculty members are involved as Principal Investigators/Co-Principal Investigators from among our base of around 600. Most proposals are inter-disciplinary involving many departments. All of them involve collaborations with international faculty/scientists. Proposals were reviewed by accomplished and senior researchers at the Emeritus level in India and abroad. The process was completed by December 2020 with 68 proposals selected spanning 21 clusters.

### IoE-CoE Research Initiatives

IoE-CoE Proposals		
No.	Domain name	Lab/Group Name
I	AI and Data Sciences	Computational Mathematics and Data Science
		Deployable AI
		Sports Science and Analytics
		Systems Biology and Medicine
II	Autonomous Systems	Autonomous Systems and Technologies
		Marine Autonomous Systems
III	Big Networks	Connected Intelligent Urban Transportation
		Intelligent Networks
		Network Systems
IV	Chemistry	Molecular Architecture
		Chiral Technology
V	Circular Economy	Low Carbon Lean Construction Technologies
		Water and Sustainability
VI	Complex Systems	Complex Systems and Dynamics
		Critical Transitions in Complex Systems
VII	Earth Sciences	Atmospheric and Climate Sciences
		Geophysical Flows
		Subsurface Mechanics and Geo-energy
VIII	Energy, Propulsion, Renewables	Advanced Gas Turbine Engines
		Carbon Dioxide Capture, Utilisation and Storage
		Energy Storage and Conversion
		Microgrid Technologies
		Photo- and Electro-Chemical Energy Sciences
		Renewable Energy Systems
Solar Desalination and Cold Storage		
IX	Humanities/Business	Memory Studies
		Start-ups and Risk Financing

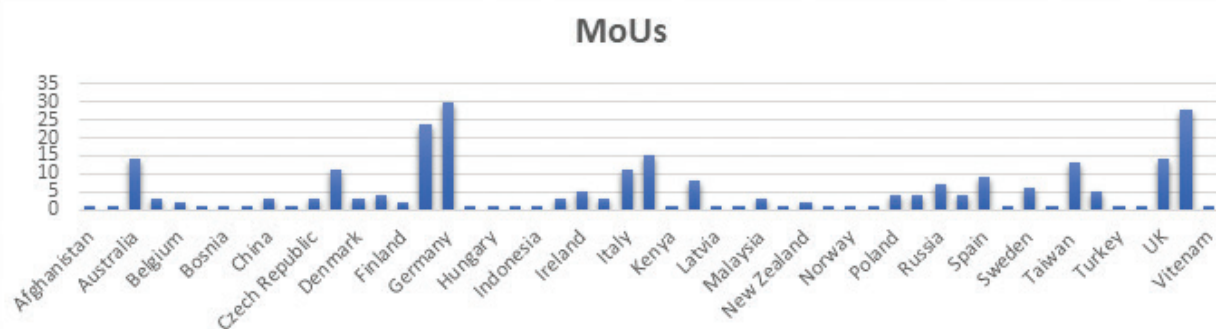
X	Advanced Manufacturing	Advanced Laser Material Processing
		Extra Terrestrial Manufacturing
		Materials and Manufacturing for Future Mobility
		Pyrometallurgy
XI	Mathematics and Cybersecurity	Algebraic Geometry
		Cryptography, Cybersecurity and Distributed Trust
		Quantum Analysis
XII	Medical Technology	Healthcare Technologies
		Medical Device Regulations and Standards
		Micro Nano Bio-Fluidics
XIII	Medicine and Biology	Cancer Genomics and Molecular Therapeutics
		Digital Neuroanatomy
		Molecular Medicine
XIV	Microscopy	Advanced Microscopy and Materials
		Correlative Microscopy
XV	Microelectronics and Integrated Circuits	Advanced Memory and Computing
		Gallium Nitride Devices
		OLED Display Technology
		Optoelectronic Carbon Nanostructures
		Photonic Integrated Circuits
		RF, Analog and Mixed Signal Integrated Circuits
XVI	Ocean Technology	Large-Scale Ocean Research
		SMART Maritime Technology
XVII	Physics	Experimental High Energy Physics
		Strings, Gravitation and Cosmology
XVIII	Quantum Science and Technology	2D Materials
		Quantum Information Theory
		Quantum Information, Communication and Computing
		Quantum Centres in Diamond and Emergent Materials
XIX	Safety Science and Systems	Human Factors and Safety Science
		Safety Critical Systems
XX	Sensing and Vision	Biosensing
		Computer Vision
		Non-destructive Evaluation, Asset Integrity and Health Monitoring
		Virtual Reality and Haptics
XXI	Advanced Materials	Responsive Soft Matter
		Soft and Biological Matter
		Millimetre and Microwave Metamaterials
		Molecular Materials and Functions
		Atomistic Modelling and Materials Designing
		Functional Oxides

### 7.13. University partnerships and student mobility

#### Memorandum of Understanding/agreements signed with foreign universities

- Nagaoka University of Technology (joint supervision agreement), Japan
- Victoria University of Wellington, New Zealand
- University of Nottingham, UK
- Center for Energy - Smart Electronic Systems (ES2), Binghamton University, USA
- Auckland University of Technology, New Zealand
- APEC Antwerp/Flanders Port Training Center, Belgium
- University of Huddersfield, UK
- The European Organization for Nuclear Research (CERN), Switzerland
- University of Regensburg, Germany
- Macquarie University (Cotutelle agreement), Australia
- Bahir Dar University, Ethiopia
- The University of Cape Town, South Africa
- The University of St. Andrews, UK
- University of Alberta (Joint Doctoral Agreement), Canada
- Graz University of Technology, Austria

#### IITM partners with more than 270 universities worldwide



#### List of Joint Doctoral Programmes

##### Australia

- Australian National University
- Deakin University
- Queensland University of Technology
- Curtin University
- University of Technology Sydney
- The University of Melbourne
- Swinburne University

##### Canada

- University of Alberta

##### Finland

- Aalto University

##### France

- École Centrale de Nantes
- University of Bordeaux

##### Germany

- RWTH Aachen
- University of Duisburg
- University of Passau

##### Singapore

- Nanyang Technical University
- National University of Singapore

##### Taiwan

- National Chiao Tung University
- National Tsing Hua University

**USA**

- Michigan State University

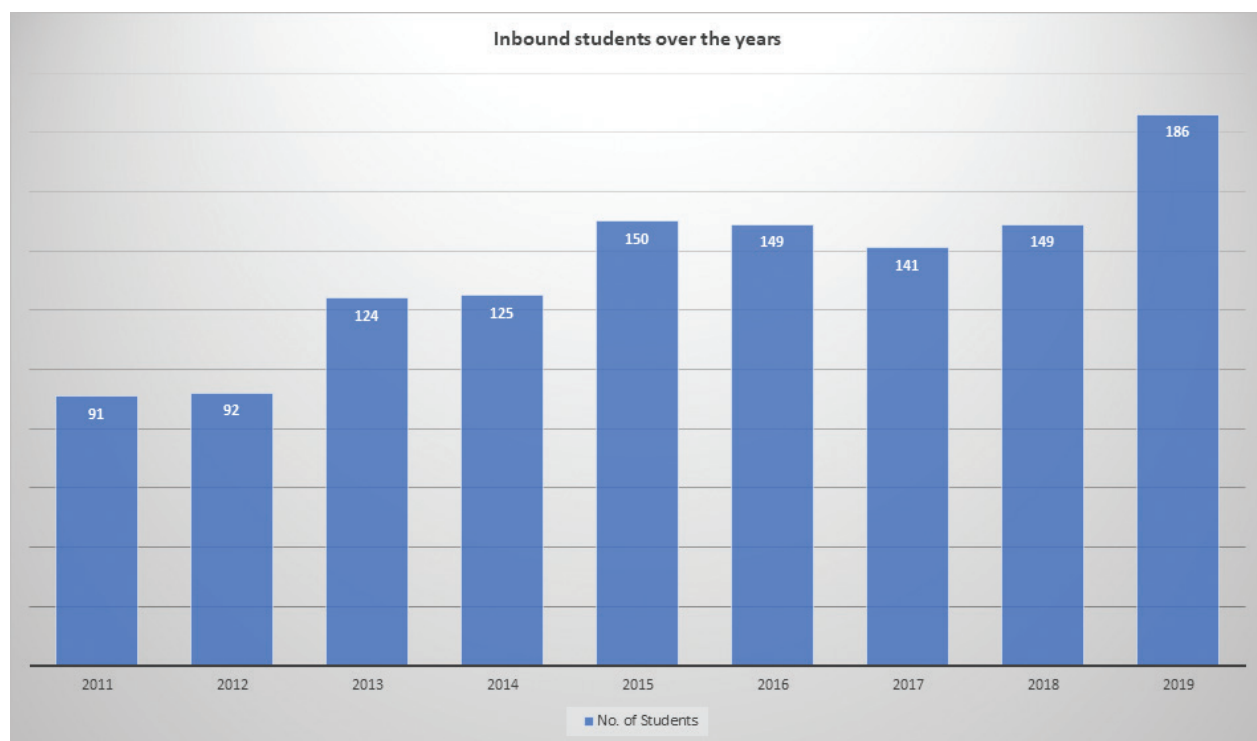
**List of Joint Supervision Programmes**

- Kungl Tekniska Hogskolan (KTH), Sweden
- Heidelberg University, Germany
- University of Sydney, Australia
- Deakin University, Australia
- The University of Melbourne, Australia
- Purdue University, USA
- Nagaoka University of Technology, Japan

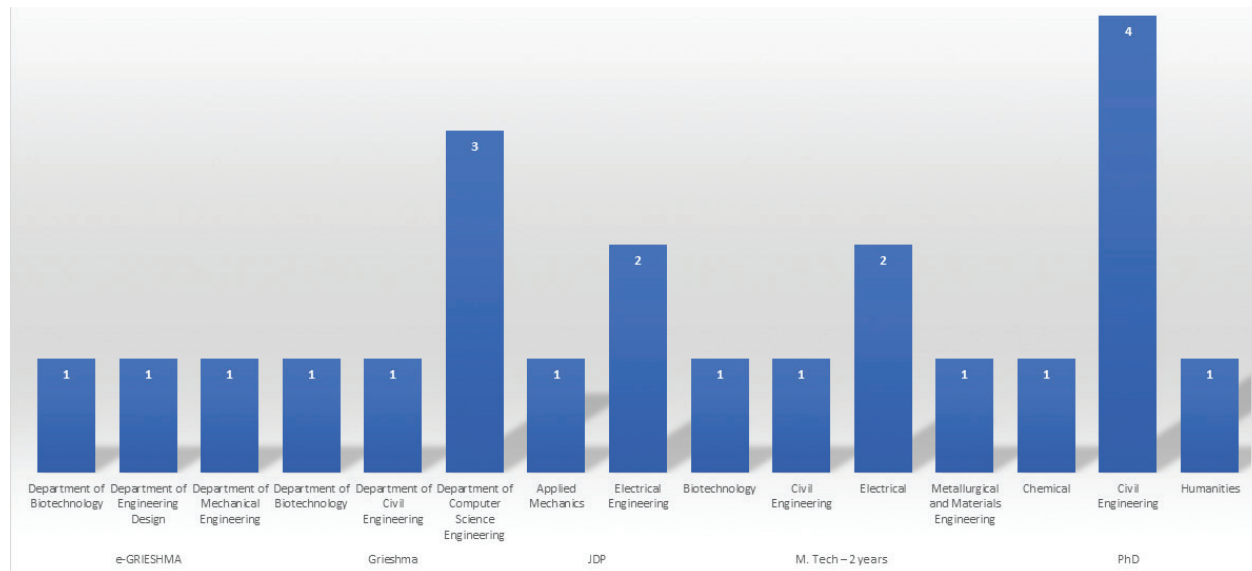
**List of Joint Masters Programmes**

- National Tsing Hua University, Taiwan
- University of Passau, Germany

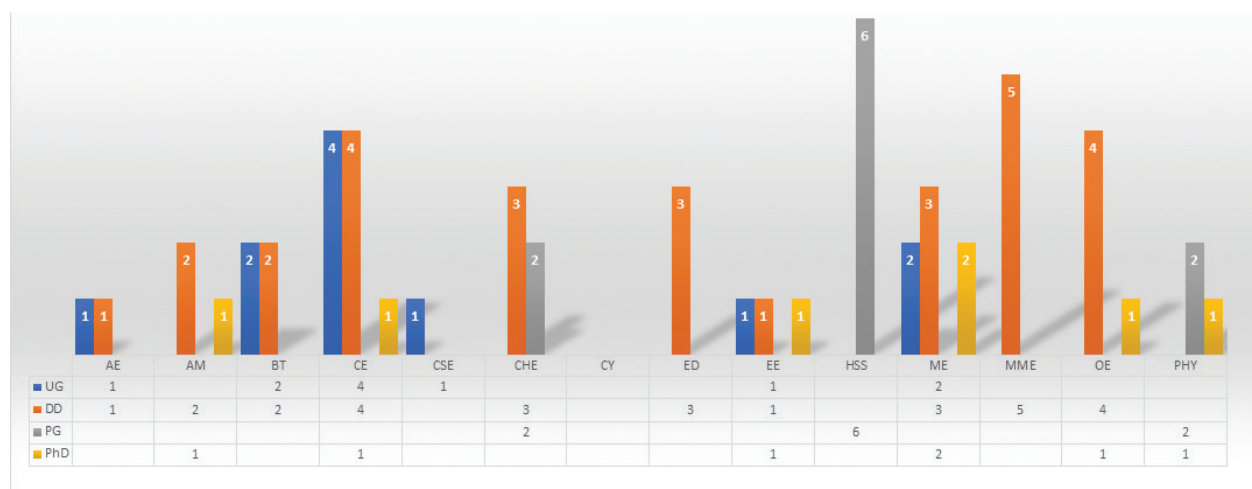
**Inbound student's data**



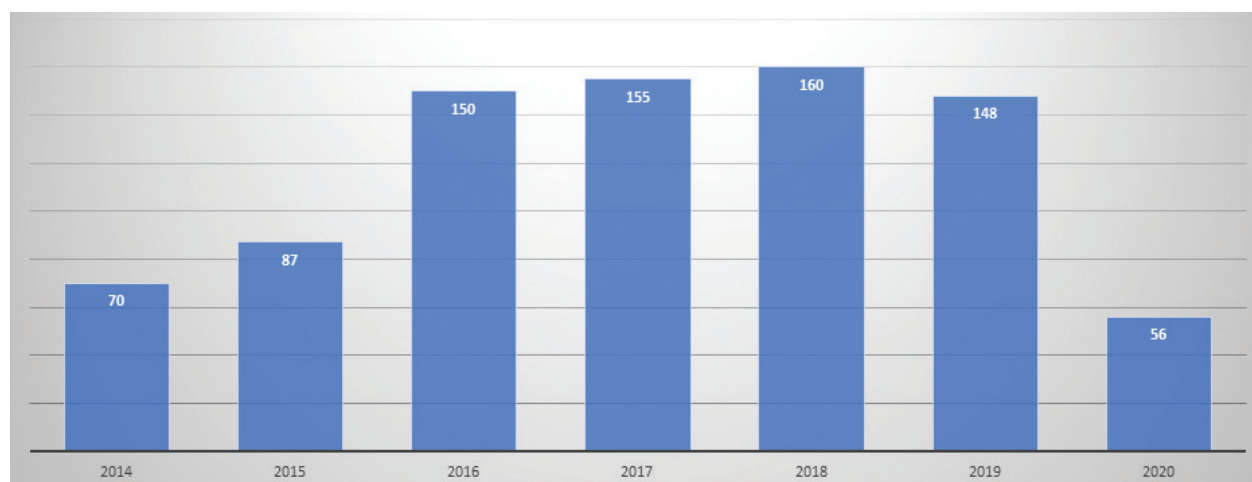
### Inbound student 2020



### Outbound students 2020 department wise



### Outbound students over the years







## Central Library

The Central Library is equipped with all modern facilities and has a rich collection of information resources in the form of CD-ROMs, online databases, e-journals, e-books, e-standards, e-patents, research support tools and printed material related to applied science, engineering, technology, humanities, management, social science and emerging subjects. The Central Library holds 4,22,037 items, including 2,563 current journals, catering to the information needs of 14,276 members, providing various value-added services with the help of modern information-handling tools and techniques. The major activities of the Central Library between April 2020 and March 2021 are described here.

### 8.1 Library Information Services: Statistics

Item	2019-2020	2020-21
<b>Collections</b>		
Books (General)	236255	262322
Books (Gratis)	6911	7859
Books (Hindi)	539	663
Books (Project)	1663	1666
Theses	8707	8808
Book Bank	15291	15291
Current periodicals by subscription	2563	2563
Back volumes of periodicals	108088	108088
CD-ROMs	1510	1510
Audio/video cassettes	448	448
E-books	12561	12819
<b>Total</b>	<b>394536</b>	<b>422037</b>
<b>Membership</b>		
Staff	674	622
Faculty/SSO/SO/Emeritus Professor/Visiting Faculty/Adjunct Professor	631	602
Students	10976	12008



Retired Faculty/Officer	165	183
Alumni members	433	441
Corporate members	42	48
Special members	00	00
IAS members	207	316
Project coordinators	56	56
<b>Total</b>	<b>13184</b>	<b>14276</b>

**Services: Circulation**

Number of books/journals issued	56001	2437
Number of books issued Book Bank (GS)	2362	704
Number of books issued Book Bank (WS)	1660	545
Overdue and other charges collected (₹)	941484	249716
Photocopy charges collected (₹)	00	00

Item	2018-2019	2020-2021
<b>Project loans to Faculty/Departments/Centres</b>		
Books issued	705	00
Inter-library loan transactions		
Borrowed from other libraries	01	17
Loaned to other libraries	09	42
<b>DDS/Reprint service</b>		
Reprints received from other institutions (pages)	195	652
Reprints supplied to other institutions (pages)	770	351
<b>Smart Cards</b>		
Cards generated/issued	5069	677
<b>Expenditure in (lakh of ₹)</b>		
1. Purchase of books/e-books (₹)	162	60.78
2. Subscriptions to journals and databases (₹)	1797.53	2031.28
<b>Journals/databases deleted</b>	<b>10</b>	<b>00</b>
<b>New journals/databases added</b>	<b>08</b>	<b>00</b>

## 8.2. ISO 9001:2015 Activities

The Central Library actively participated in ISO 9001:2015 activities and successfully completed towards maintaining quality-based library system services and procedures. The major activities related ISO 9001:2015 are listed here:

1. An Internal Audit for ISO 9001:2015 was conducted on 4 August 2020
2. An ISO Management review meeting (QSM-I and QSM-II) was held on 7 September 2020
3. An Internal Audit for ISO 9001:2015 was conducted on 19 January 2021
4. An ISO Management review meeting (QSM-IITM) was held on 16-17 February 2021

## 8.3. Major Initiatives

The Central Library has taken various initiatives to improve the existing infrastructure, facilities, services and procurement of bookshelves to increase the collections to provide strong and dynamic support to the academic, research, development, continuing education and industrial interaction programmes and policies of the institute. Some of these initiatives are described in the following sections.

### 8.3.1. Online book recommendation system

The online book recommendation system is implemented with the help on alumni <https://books.iitm.ac.in>. The server has been integrated with ADS/LDAP authentication. The faculty members login with their ADS credential and provide only ISBN of the book in the form. It will search the book details with Google Books API and fetch the bibliographic details. The faculty member recommends the book for purchase. The system then will send an auto-generated email to the department LAC member. The member will approve or reject the request. After approval, the library will initiate the book procurement.

### 8.3.2. Online resources (e-journals, e-databases, e-books, patents and standards)

1. IIT Madras gets online journals and databases access from 15 publishers through e-ShodhSindhu Ministry of Education consortia.

2. Access to the e-databases and e-journals of various publishers, including the following, were renewed: American Chemical Society, AGU, AIAA, AIP, American Mathematical Society, Blackwell, BMJ, De Gruyter, Elsevier, ICE, Indian Economy Database, IOP, ISI–Emerging Market, JSTOR, Journal Citations Report (JCR), MANEY, MathSciNet, Mendeley Institution Edition, NPG, One Petro, ORBIT Express, Oxford University Press, ProQuest: Dissertations and Theses (PQDT), PsyArticle, RSC-Gold, Sage, SIAM, Sage Research Methods Online (SRMO), SciFinder Scholar, Science (online subscription), Scopus, Taylor & Francis, Thomson Core Patents, Thomas Telford, Turnitin, UpToDate, Web of Science, Wiley, Xlpat-Novelty Checker

3. E-Books from AMS, Cambridge University Press, CRC, De Gruyter, Elsevier, Edward Elgar, Emerald, ICE, IOP (2018 collection), McGraw-Hill, Oxford University Press, Pearson, RSC, SAE, Wiley, World Scientific, ProQuest Ebrary and EBSCO, Morgan and Claypool e-book collection, McGraw Hill Business and HR collection, IET Digital Library (2015-19) e-books were purchased with perpetual access rights.

4. The e-book subscription packages: ProQuest Academic complete subscription, EBSCO Engineering eBook collection and Knovel-Engineering Technical Reference Information.

5. The Brill Humanities and Social Sciences Journal Collection (228 titles) package is added and EBSCO Business Source Complete upgraded to Business Source Ultimate.

### 8.3.3. E-ShodhSindhu Consortium

The Ministry of Education has formed e-ShodhSindhu Consortium for Higher Education Electronic Resource, merging three consortia initiatives, namely UGC-INFONET Digital Library Consortium, NLIST and INDEST-AICTE Consortium. The main objective of the e-ShodhSindhu: Consortium for Higher Education E-Resources is to provide access to qualitative electronic resources, including full-text, bibliographic and factual databases to academic institutions at lower rates of subscription to universities, colleges and centrally funded technical institutions in India. IIT Madras got the access to 15 e-resources from e-ShodhSindhu in the year 2020.

**E-Resources Usage Statistics (April 2020-March 2021)**

Resource Name	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
ACM Digital Library	198	293	267	302	375	712	520	450	418	429	641	1292	5897
American Institute of Physics	1429	1936	1726	1752	2155	2045	2612	2888	2665	3131	3472	4805	30616
American Society of Civil Engineers	800	706	649	584	425	523	689	804	541	653	742	1062	8178
Annual Reviews	230	165	160	187	216	409	205	269	247	224	214	318	2844
APS	1114	1322	1381	1779	1993	2286	2173	1875	2130	2500	2281	2866	23700
ASME	208	373	302	387	523	475	492	575	613	548	572	779	5847
JSTOR	4183	4294	3673	3914	2770	3458	4359	4419	3582	2690	2444	3657	43443
MathSciNet	1722	2430	5409	6834	7149	12787	6147	5154	4776	6674	5259	6916	71257
Nature	3326	3048	3099	3357	3345	3769	3631	3664	3364	3230	3144	4118	41095
Oxford University Press	397	417	396	424	492	646	818	851	700	718	765	914	7538
Project Muse	84	104	122	93	43	124	225	241	178	203	102	247	1766
Springer Link	4979	5896	5144	6075	6555	6543	7558	7475	7268	8088	8154	10522	84257
Web of Science	1992	3149	3655	2375	2777	2757	3345	3966	3198	3494	3140	3200	37048

**8.3.4. User awareness programme**

During the lockdown, the Central Library organised following user awareness programmes for students, scholars and faculty members of IIT Madras through webinars of various publishers.

How to publish with Oxford journals?	9 July 2020 (3.30 pm)	OUP
Plagiarism Check by using URKUND Software	10 July 2020 (3.4 pm)	INFLIBNET
How to publish open access and succeed with your publication?	13 July 2020 (3-4.30 pm)	T&F
Increasing Research Impact	20 July 2020 (3-4.30 pm)	T&F
Excellence in Peer Review: How to be an Effective Peer Reviewer	27 July 2020 (3-4.30 pm)	T&F
Essential Guide to Literature Reviews with Web of Science	29 July 2020 (5-6 pm)	Clarivate
Publishing Ethics	4 August 2020 (3-4.30 pm)	T&F
Editorial Experience and Perspectives	10 August 2020 (3-4.30 pm)	T&F

### 8.3.5. Smart card facilities

The Central Library provides smart card facility to institute students, faculty, staff members and other members (IAS and corporate members, alumni and retired employees of the institute). A dual-side retransfer smart card printer is used. The library also provides dependent cards to the dependents of current institute employees.

### 8.3.6. Weeding out of documents

The Central Library staff have identified mutilated documents, multilingual donated books, highly damaged old books, pamphlets, and bound volumes of abstracting and indexing. A total of 9,815 documents were recommended by the 143rd and 144th Library Advisory Committee for write-off. After obtaining the condemnation approval from the Director and Audit clearance, the Store and Purchase section sold out the documents through an e-auction.

### 8.3.7. Tracing of publications

Since library users were not allowed inside the library during the COVID-19 pandemic lockdowns, they informed the library to send their book requests through emails. Books were then located by the library staff and issued to users' library accounts. The books were handed over to users following the SOP of COVID-19.

### 8.3.8. Scholars/Faculty profile

The Central Library has set up a Scholars Profile of faculty members of IIT Madras with IRINS. A web-based service, the IRINS or Indian Research Information System Management service is developed by Information and Library Network (INFLIBNET) Centre in collaboration with Central University of Punjab. <http://iitm.irins.org>.

### 8.3.9. Remote access off-campus access facility for e-resources

The Central Library has set up a remote access off-campus facility, <https://idp.iitm.ac.in>, with single sign-on SHIBBOLETH authentication, in collaboration with INFLIBNET as well as individual publishers. The SHIBBOLETH open-source software server with INFED - INFLIBNET Access Management Federation set up at IITM makes available more than 45 e-journals/eBooks/databases/standards resources with off-campus access through LDAP login for faculty, scholars, students and staff.

### 8.4. Retirement of staff members

Dr A.V. Selva Vinayagam, Senior Technician (Library), retired on 31 May 2020.

### 8.5. Automation

1. The e-books have been catalogued in the library WEBOPAC (<http://webopac.iitm.ac.in/>.)
2. The new library website has been designed and updated.
3. The new programme features have been added in the online book recommendation portal <https://books.iitm.ac.in>
4. The remote access <https://idp.iitm.ac.in> setup enables off-campus access to e-resources.
5. Data relating to 190 patrons' (students, faculty and staff members, alumni, IAS members) records were added to the Virtua-VTLS database.

### 8.6. LAC recommendations

1. The 147th Library Advisory Committee (LAC) held on 24 December 2020 and recommended to continue the renewal subscription of existing collections of journals and databases for the year 2021. Since all these e-resources are being made accessible to the faculties and students for their academic teaching learning purpose through remote access during this COVID-19 pandemic period.
2. The 148th Library Advisory Committee held on 25 March 2021 and recommended to subscribe the archival collections of ACS Legacy Archive and Springer Materials database.

### 8.7. Plans

1. To initiate the submission of scholars' electronic theses into the I-Repository of IIT Madras
2. To initiate the creation of a database of bound volumes
3. Updation of project/permanent loan book database
4. To organise professional development lectures and other professional events
5. To weed out and write-off mutilated, old, unused books and German books.
6. Condemnation of old outdated computer hardware and furniture, etc.
7. Proposed to facilitate a 24 hours' Reading Hall in the Central Library.

## 9

## Students Amenities and Activities

### 9.1. Hostels

Being a residential institute, IIT Madras requires students to reside in the hostels on campus. At present, there are 16 men's hostels and four ladies' hostels for undergraduate and postgraduate students, research scholars and project staff. A total of 6,948 single rooms, 70 double rooms, 196 triple rooms, five quadruple rooms and three quintuple rooms are available in the hostels. Research scholars and some students in the master's programmes who are married and seek family accommodation on campus are housed in earmarked quarters. Students from the armed forces are provided accommodation in the Married Officers Housing (MOH) quarters. During the period under report, there were 8,420 students residing in the hostels.

At present, there are 10 dining halls (messes) that cater to the students and project staff members in the hostels. Of these messes, six are in Himalaya building, two are in Nilgiri building, and two (for lady students)

are in Vindhya building. All the messes are run by private contract caterers. The mess registration and allocation of mess to students are done online based on students' preference. Similarly, the request for accommodation and allotment are managed online. The housekeeping services in the hostel are outsourced.

Each hostel is administered by a Warden (a faculty member), an Assistant Warden (a senior research scholar or project staff member) and a Hostel Council, consisting of student secretaries and the Assistant Warden, who assists the Warden. Each hostel office is supported by the staff of the Office of the Hostel Management (OHM), which is a centrally administered body and in charge of the overall functioning of the hostels. During the year, the OHM initiated efforts to make most of its activities online. An online portal with all student-required menu was introduced. The students are using the following facilities extensively:

S. No.	Warden	Hostel
1.	Dr Shaligram Tiwari, Professor, Mechanical Engineering	Chairman, Warden Council
2.	Dr Sankaran S, Professor, Metallurgical and Materials Engineering	Alakananda
3.	Dr R Jayaganthan, Professor, Engineering Design Department	Bhadra
4.	Dr Nilanjan Saha, Professor, Ocean Engineering	Brahmaputra
5.	Dr Sriram V., Associate Professor, Ocean Engineering	Cauvery
6.	Dr Somnath Chanda Roy, Associate Professor, Physics	Ganga
7.	Dr Dillip Kumar Satapathy, Associate Professor, Physics	Godavari

8.	Dr Anbarasu Manivannan, Associate Professor, Electrical Engineering	Jamuna
9.	Dr Ratna Kumar Annabattula, Associate Professor, Mechanical Engineering	Krishna
10.	Dr Jeganmohan M, Associate Professor, Chemistry	Mahanadhi
11	Dr Vignesh Muthuvijayan, Associate Professor, Biotech Engineering	Narmada
12	Dr Radhakrishnan G. Pillai, Associate Professor, Civil Engineering	Pampa
13	Dr Krishna Nandivada V, Professor, Computer Science and Engineering	Saraswathi
14	Dr Kavitha Arunachalam, Associate Professor, Engineering Design	Sarayu
15.	Dr Lata Dyaram, Associate Professor, Department of Management Studies	Sharavati
16.	Dr Shruti Dubey, Associate Professor, Mathematics	Sabarmati
17	Dr Narasimhan Swaminathan, Associate Professor, Mechanical Engineering	Sindhu
18	Dr Sushanta Kumar Panigrahi, Associate Professor, Mechanical Engineering	Tamiraparani
19.	Dr Arunachalam N., Associate Professor, Mechanical Engineering	Tapti
20.	Dr Arshinder Kaur, Associate Professor, Management Studies	Tunga

## New Proposals

### 1. Proposal of Hybrid Model for Himalaya Food Court

- Created a proposal for expanding current HFC into mess cum food court facility
- Formed a team with the objective of finding solutions for the problems
- Talked with vendors and analysed the problems to come up with a solution beneficial for both students and vendors.

### 2. Proposal for Comprehensive CMGFS Application/Website

- Created a proposal for a comprehensive application/ website dedicated to the facilities available in the institute
- Formed a team with objectives of meeting the needs of students
- Finalised on the creation of comprehensive app/ webpage with various interfaces to facilitate all stockholders

## COVID-19 Protocols and Scenario

### 1. Handling COVID-19

During the initial period of lockdown, the number of students inside the campus was low, still Krishnavilasm functioned and was of immense help to students (other vendors were not able to function). Once the number of students reached 500, Prime Mart was opened for students. Krishnavilasm provided extra support by delivering food in the Academic zone for day scholars. When the conditions became better, Usha Cafe and Coolbiz were opened to the students.

### 2. COVID-19 Protocols

Initially, only Krishnavilasm functioned and timings provided by the Greater Corporation of Chennai (GCC) were followed. It was made sure that social distancing norms were followed inside the facilities and only hostellers were allowed. Students were monitored with the help of staff and as situation changed, required protocols were adapted to cater to the situation as necessitated by the GCC.

### Addressal of issues

Several town hall meetings were conducted to discuss the issues faced. Online feedback was taken from the students staying in the institute to improve the situation and working of the facilities. The team was able to address complaints and issues of students online through emails. A task committee was set up to monitor and address the issues of students inside the campus. Efforts were made to increase the number of working facilities in the institute even with low target audience

### MITr

MITr is a body comprising UG and PG student coordinators and MITr Chief Faculty Advisor and Faculty Co-advisor, who work together with professional counsellors from the Wellness Centre to actively provide help and personal assistance to campus students. The objective of MITr is to be there for the students who may be facing any curriculum and academic, personal, social or other problems that have a negative effect on their overall wellness. MITr supports students when they are going through any mental health problem, varying from stress to depression, and helps to improve mental health conditions of the students on the campus.

### Events

- A call for MITr coordinators was sent out to the student body, the deadline for which was 8 November 2020.
- The Mitr Core Team made a presentation to the incoming batch of UG students during the Immersion programme conducted by Saathi on 15 November 2020. The students were informed about the role of MITr and relevant contact details.
- Aspiring coordinators' meet was conducted on 17 November 2020 for all the candidates.
- Selection for MITr coordinators was conducted by the Core Team, Wellness Team and Faculty Advisors from 28-30 December 2020. Interviews were held over three days by two panels and candidates were evaluated based on a five metrics-based scoring system.
- An informal meeting with Wellness Team and MITr Team was conducted on 15 January 2021. The coordinators brainstormed ideas for better campus presence of the MITr Team with the Wellness Team.
- An official MITr Team Meeting with Faculty Advisor, Faculty Co-advisor, Saathi Core, Saathi Faculty Advisor and Wellness Team was held on 7 February 2021. The Mitr team took their verbal oath to fulfil their responsibilities and maintain confidentiality. The SoP of the team and documentation was discussed.
- Mitr coordinators were allocated department-wise

on 16 February 2021.

- The first training session for Mitr coordinators was conducted by Ms Puroitree Majumdar, YourDost on 6 March 2021. The session covered the complete basics of barefoot counselling such as how to spot someone in distress, how to communicate with them, active listening and empathy, and how to refer for professional help.
- The second training session for Mitr coordinators was conducted on 11 March 2021 by the IITM Wellness Centre. In the first part, the training session covered aspects of how to be a Mitr coordinator and included topics such as communication, counselling skills and process, rights of person in need, and requirements of the volunteers. This section was handled by Mr Arun Antony. The second part was handled by Ms Madhumitha Sriram and included topics related to mental health training-scenarios in which coordinators could intervene, when to escalate immediately, easy-to-use techniques for dealing with sleeplessness, fatigue or for problem solving, virtual times and others.
- Mitr, along with the Wellness Team, did a survey among IIT Madras students asking them about the difficulties faced, their mental health and wellness, from 9-19 March 2021. The survey received responses from 220 students (128 UG and 90 PG). The students were also given an option to choose how they would like these issues to be addressed-through group initiatives, individual sessions with psychologists and talking to Mitr coordinators, among others.
- The third training session for Mitr coordinators was conducted on 3 April 2021 by the Wellness Centre.

### Student Initiatives

- Mitr coordinators helped students by engaging them in conversations and gave them one-on-one guidance or barefoot counselling wherever required.
- Additionally, some Mitr student coordinators followed confession pages or meme pages on social media and let the confessors know through comments that Mitr is available for them.

### Student Survey Initiative

Through the survey, 24 students who had requested for assistance were connected to 21 Mitr coordinators for interaction. Additionally, 139 students who wanted to speak to professional counsellors were directed to the Wellness Team or YourDost.

### The Wellness Centre has been conducting group initiatives to help alleviate major issues identified from the survey, which are as follows:

- Need motivation to go about one's physical



wellbeing with greater enthusiasm and consistency (122 students)

- Lack of networking with peers and faculty when staying at home (116 students)
- Dealing with negative thoughts (111 students)
- Handling academic stress with burden of Positions of Responsibility (109 students)
- Having a schedule during Covid lockdown (107 students)
- Dealing with uncertainties in future (106 students)
- Learning to be with yourself (70 students)
- Coping techniques such as journaling, arts, etc (57 students)
- Handling academic stress with the burden of personal problems (52 students)

### Saathi

In 2020-21, Saathi kicked off some brand-new initiatives and continued the highly welcomed initiatives of previous years with greater participation and success. The initiatives taken by the team in the year are listed (roughly in chronological order) below:

#### Online challenges

In the initial days of the lockdown, the students were pushed into an anxious state where they did not really know where and how to spend the ample time in hand. To break the inactivity, Saathi conducted a series of challenges, out of which Dish-a-Day Challenge was well received and saw enthusiastic participation. The institute gave gift vouchers to winners.

#### Wellness Marathon

This series of online sessions were planned and executed with the help from Wellness Centre. These sessions were hosted on six different, relevant themes on six different days. There was good participation from students. The sessions were interactive in nature and ensured that no questions remained unanswered. Student Co-Curricular and Extracurricular Activities

#### Sangam

The heart of the cultural scene, Sangam is the conglomeration of the literary and artistic clubs of IIT Madras. In 2020-21, all Sangam activities were fully online, and the clubs organised events tailored to the new, online scenario. The diverse range of events, workshops and shows was kickstarted by the Online Club Weekender, spanning two days, where all clubs showcased themselves and gave the freshies a taste of Sangam. Clubs then held Freshie Orientations, which saw huge participation. LitSoc, IITM's annual series of inter-hostel cultural competition, was fully online and each club organised events. LitSoc started in November 2020 and resumed in March 2021. The clubs came up with innovative methods to interact

with the student body, and the first iterations of Cult Buddy and Club Members were introduced this year.

#### Saarang

Saarang 2021, the annual cultural festival of IIT Madras was held successfully from 4-7 February 2021. The festival, which was organised by a student team, had an online edition this year and saw more than 16,500 views and over 10,000 students from across the country participating. The professional shows had performances by Carnatic 2.0 (Mahesh Raghavan and Shravan Sridhar), 22 Bullets, The Yellow Diary and Jonita Gandhi. Govind Vasudev Menon and the cast of the webseries Scam 1992 were some of the major attractions in the Spotlight lineup. The first iterations of Saarang LitFest and Divyakalashakti also took place in Saarang 2021.

#### Contingent

The Cultural Contingent of IIT Madras is a group of students, who are highly skilled in cultural activities and represent our institute in various college fests and build the cultural scene in the institute. Contingent selections took place for the following clubs this year: Fine Arts, Music, Classical Arts (Music), Oratory, Comedy, Quiz.

The Music and Classical Arts contingent compiled learning resources for various categories in their respective clubs based on a survey on what students wanted to learn. A total of 53 contingent members have signed up to be counsellors in the CultBuddy programme.

#### Research Affairs Secretary (RAS)

The Research Scholars Portal at IIT Madras is an initiative to create a one-stop spot for all activities and information pertaining to the research sphere, including documents, formats, internships, placements, announcements and the ability to connect with peers and other stakeholders to enhance, encourage and power the research scholars to execute cutting-edge research.

The Research Scholars portal ([scholars.iitm.ac.in](http://scholars.iitm.ac.in)) was upgraded at a cost of Rs.2.90 lakh to enhance its features. The salient features of the upgrade are:

- 1) Addition of an Internship Alert email option for scholars interested to pursue an internship
- 2) Permission/Access to PMRF scholars to update the details about their own website and to view it from the portal
- 3) Access to alumni to log in and connect with the scholars for mentorship
- 4) A one-stop compendium of information for all current scholars
- 5) Auto-generation of a Curriculum Vitae (CV)
- 6) Facility for companies to register and view and

connect with the research scholars

7) A snapshot of the latest trends and keywords popular among scholars

8) A detailed breakup of scholars' distribution across departments and interest

### **Socially relevant activities carried out by the team**

The Research Scholars Day (RSD) 2021 team had a session on Sustainable Food and Fashion, which helped the audience understand the amount of research involved in basic things such as food and clothes as well as the areas in which research can be done to improve and encourage sustainable lifestyle. Additionally, the Research Scholars Day 2021 was founded on the theme, Shunya: Nano to Cosmos, which emphasised on zero percentage wastage and sustainable living, and how research can help us do the same. The idea was to spread awareness about the need for sustainable living, recycling, reusing and reshaping our world for a better future. There were 11 seminars and 19 workshops conducted during the year.

### **Extra Mural Lectures**

The Extra Mural Lecture (EML) series, a long-standing student initiative, was vibrant as ever. The series had near 12 speakers speaking on different topics, which sparked young minds.

### **Inter IIT Tech Meet**

The Inter IIT Tech Meet is the annual technological competition organised by the Indian Institutes of Technology and qualifies as the only technical event wherein all the IITs participate. This event is hosted in cycle by one of the participating institutions. The meet saw its humble beginning in 2012 at IIT Kanpur as Pan-IIT Student Initiative and now has grown into an annual meet approved by IIT Council. Primarily, the Inter IIT Tech Meet would have collaborative events targeting networking and knowledge sharing and competitive events, which fuel innovative work with given constraints to meet the mission and vision of the meet. The meet had overall 13 events in which the institute won two gold, two silver and one bronze medals.

### **Centre for Innovation Projects**

This year, Centre for Innovation (CFI) took up more than 50 multidisciplinary projects across several clubs. Thirteen of these projects were a part of the Student Innovation Program (SIP), where students themselves came up with ideas for innovative solutions that were incubated under CFI clubs. More than 300 students were an active part of Project Program this year. Despite several hardships the project teams faced due to online semesters, students

showcased an unprecedented enthusiasm towards their projects and delivered maximum efforts to complete a significant portion of their project. All the projects were exhibited for CFI Open House, where project teams interacted with institute students, professors and industrialists.

A few key projects of year 2020-21 are mentioned below.

- Bot-19 - Electronics and CVI Club
- Plan and Proposal - Product Design Club
- Waste management app - Sahaay
- Automatic cooking machine - Electronics Club
- Sounding Rocket - Horizon, Physics and Astronomy Club

### **Entrepreneur Cell**

The Entrepreneurship Cell makes the entrepreneurial world accessible to all segments of the IIT Madras ecosystem and a wide audience outside, from start-up enthusiasts to full-time entrepreneurs, through many, year-long events such as conclaves, keynotes, industry-defined problems, B-planning, and fundraising competitions and workshops.

### **Activities**

- COVID-19 Webinar Series
- E-Trivia
- Plandemic
- Ideathon
- Start-up Series
- Inspirit Lecture Series
- Start-up Services Projects
- Winter Internfair
- E-Buddy
- Team Up
- Thinker to Tycoon

### **Social responsibilities**

#### **Pankh: Opting Vertical over Horizontal**

Pankh is the social campaign of E-Cell, IIT Madras aimed at nurturing, harnessing and empowering the fuel cells of the Indian economy: the micro, small and medium enterprises (MSMEs). The vision of the campaign is to create a sustainable MSME ecosystem in India by solving their problems entrepreneurially. The campaign is also meant to make the youth aware of the MSMEs sector in India and understand its importance and complexity to the economy. The key objectives of the campaign are to enable growth and opportunistic support for Indian MSMEs, empower the enterprises to build sustainable business models, and highlight and resolve their challenges while engaging the youth.

#### **Entrepreneurship Development Drive (EDD)**

The drive is a structured mentoring programme with

periodic interactive sessions launched with the vision to sustainably develop the entrepreneurial ecosystem in some of the potential institutes across India. The drive focuses on identifying and utilising the pool of resources, unification of institutional start-up ecosystem, and development of extensive network.

### Education-21

An initiative to help shine a national spotlight on the importance of 21st-century skills for school students, identify critical elements of education in this century, and highlight the resources, research, policies and best practices that bring these skills to the classroom. The school students were mentored on prototyping and business plan on their respective ideas.

### Nirmaan

Nirmaan, the pre-incubation cell of IIT Madras, aims at providing entrepreneurial experience to students. Acting as a pipeline between institute students and the Incubation Cell of IITM Research Park, its vision is to encourage students to think beyond placements and explore converting their creative projects into start-ups. Budding entrepreneurs are provided workspace, seed funding, mentorship, and an opportunity to network with alumni and entrepreneurs coming to the institute, empowering them on their journey to incubate their start-up. It is a co-curricular affairs' initiative of IIT Madras inaugurated on 31 October 2015 and funded by the batch of 1992. Since its inception, Nirmaan had 96 student teams go through its programme, 18 of which successfully graduated and established their ventures. The cell currently incubates 36 start-ups across sectors.

### Key initiatives and milestones

- One Step at a Time
- Nirmaan newsletter series
- Traktor: Incubator Management System
- Nirmaan-E-Cell Ideathon
- Medium blog
- GDC-Nirmaan Inspire Program
- Alumni Nite Winners
- Nirmaan Demo-Day 2021

### E-Summit 2021

With entrepreneurship continuously gaining a strong foothold as a future option for students, it was inevitable for the event to take a huge leap from the previous editions. The summit, IIT Madras' annual flagship event focused entirely on young entrepreneurs and their ventures, is an entrepreneurial extravaganza filled with an insane amount of energy and enthusiasm. There is something for everyone to gain and learn, be it in the form of knowledge, prize or funding for the start-up. From pitch-fests to lectures and workshops, E-Summit is truly one of the

finest learning opportunities for attendees and other stakeholders.

### A. Alumni Relations

**Letters from Alumni:** A COVID-19 morale booster, the initiative had alumni, who graduated during the financial crisis, share their experiences with 2020 graduands.

**From Insti and Beyond podcasts:** The podcasts were based on the interactions with alumni on how to navigate the professional world during uncertain times and giving general professional advice. This series complemented Chennai36 articles that helped students find the way in professional waters,

**Alumni Placement Tunnel:** An outreach to the alumni community encouraging them to bring opportunities during IIT-M placements, the campaign was conducted in collaboration with the IPR Team.

**UPSC Connect:** An initiative to increase the number of students clearing UPSC from the institute by mentoring aspiring students. We had around 25 alums, who are civil servants currently and keen to mentor students. They conduct panel discussions and a test to shortlist the interested students, who are then shortlisted to be mapped with alums for mentoring.

**Career-specific webinars:** Webinars conducted by alumni well-established in selected careers to demystify the career path and encourage students to explore varied opportunities.

**Freshie Welcoming Video:** A alums were interviewed to make a video on welcoming freshers. The video was showcased during the orientation of IAR Student Council.

Distinguished Alumni Awardees Citations and Questionnaires

Twelve citations were prepared to felicitate the Distinguished Alumni Awardees of IIT Madras on the Institute Day, 2021.

**Unconventional Careers:** The alumni, who chose unconventional career paths, were interviewed and their experiences were documented in articles and shared on the IIT Madras student-alumni blog, [chennai36.iitm.ac.in](http://chennai36.iitm.ac.in).

### Pan-IIT Conclave

- A conclave of webinars and panel discussions by alumni from different IITs.
- The topic of the conclave was Converging Samaj, Sarkar, Bazaar for a Systematic Response to COVID-19.
- The conclave mainly consisted of fireside chat series by global IIT alumni with Indian policy makers, industry captains and third sector leaders.
- The event was publicised in insti podcasts through mails and posters.

### Yearbooks

A book of creative content, photographs of the outgoing batch of students, and messages from the dean and director to serve as memorabilia for the batch was created. The book had two versions of 140 pages for UG students and 178 pages for PG students.

### Additional activities

- Graduand memoirs
- Collated and published video memoirs from the 2020 batch of graduands
- Post-Doc Opportunities Abroad Talk
- Assisted the RAS Career Development Cell in identifying alumni speakers to host a talk for students regarding post-doc opportunities
- Hostel renovations
- Assisted the Office of Alumni Relations in understanding students' needs in renovating hostels through the Keep it Flowing Campaign; gathered student testimonials for donor reports.
- Scholarship awareness ideation
- Provided recommendations to the Office of Alumni Relations on improving student awareness regarding scholarships
- Alumni Advice to Freshers 2020
- Connected with alumni to collect their Insti experiences and their advice for freshers to compensate for the 2020 freshers' lack of interaction with the IIT-M fraternity.
- IIT-MAA Sangam 2020
- Proposed and ideated on pre-Sangam event for publicity
- Performed a market-study to optimise the sponsorship and job fair processes; executed sponsorship deals
- Reached out to start-ups to present at the exhibition
- Interviewed the speakers

### B. Corporate Relations

**MBA Workshop:** A webinar on CAT preparation was conducted in collaboration with the TIME Institute. The webinar was followed by a workshop for resume, SOP and interview process.

**Associations:** Exclusive deals were struck with the following companies to cater to the IITM community:

1. ICICI Credit Cards: Benefits for students via savings on expenditures, restaurants, international offers and lifetime savings accounts
2. JAG Educate: Limited-time, free access to the test-series of the quizzes of quant, logical reasoning, basic aptitude reasoning and English (BARE), and verbal reasoning
3. Medibuddy: Discounts on pharmaceuticals and

healthcare services

4. Offimart: Home delivery of stationery
  5. InterviewBuddy: Discount on placement interview practice and preparation material and test series
  6. Lenovo: Discounts on laptops
- In addition, more than 12 PR deals were executed for Insti and Beyond podcasts.

**CSR campaign:** The team worked with the Corporate Social Responsibility (CSR) team of the Office of Institutional Advancement, Alumni and Corporate Relations to identify key projects pursued at IIT Madras for publicity among CSR partners. The professors working on these projects were interviewed to prepare CSR proposal reports.

**Industry Conclave 2021:** A two-day conclave was ideated and executed to improve industry-academia collaborations and open new avenues for funding for IIT Madras. More than 800 people participated in the conclave with about 35% attendees being industry experts, 57% students (outside colleges and IITM) and 8% researchers and professors.

The lecture series of the conclave had 21 speakers, including industry experts and professors. The exhibitions had 34 booths, including CFI projects, start-ups from Nirmaan, HTIC and IITM Incubation Cell, and over 2,000 visitors. Overdone, a product-based, industry-themed competition, received more than 400 registrations.

### C. Global Engagement

- **Global Engagement Website:** We worked together with the GE Office to overhaul the website. New content was generated to make the website well rounded; the inputs were provided from the students' perspective.
- **Student Engagement Survey:** The survey results will be used to direct the efforts of the GE Office to increase the number of outbound students.
- **Semester Exchange Information Session:** An information session was conducted for the student body and the GE Office. The session was aimed at giving fundamentals, answering queries on semester exchange and introducing freshers to the programme.
- **Siddhi Webinar Series:** Launched to figure out the ways of increasing outreach, the series was conducted in assistance with the GE Office and had over 10 webinars with experts from different fields and across the country.
- **World Culture Quiz:** The quiz, conducted alongside Quiz Club, IITM, focused on world culture and had participation of over 50 people.
- **World Culture Wednesday Poster series:** The new poster series was ideated and created on Instagram to increase social media outreach of the new GE

team. The series highlighted aspects of various cultures around the world. The increased outreach would further help in spreading information about the initiatives of the team and GE office.

- World Culture Café: The team completed the ideation and structure of the Discord server. A mock server was made. The server was optimised with bots and database of all the ideations documented, to be handed over to the incoming heads.

#### **D. Institute Branding**

- Sangam Sustainability Campaign: During Sangam 2020, a sustainability campaign was launched in collaboration with ilivesimply.org by Mr. Sonam Wangchuk to encourage the IIT Madras fraternity to take up sustainability pledges.
- NIRF Rank Analysis: NIRF was analysed and explanatory articles and informatics were prepared to promote IIT Madras' first position in NIRF for the fifth time in a row. The initiative aimed at clarifying myths surrounding NIRF and establishing its credibility in public.
- From Insti and Beyond: IAR Student Council was represented in the Dare2Compete podcast presenting the initiatives taken during the online semester. An article on Dare2Compete was published as an interview with the student team involved in the initiative encouraging professionals all over the globe to listen.
- Branding IIT Madras to aspirants: A website dedicated to the information and guidelines on admissions to IIT Madras was built. A social media campaign was run before and during JEE counselling to establish IIT Madras as the preferred choice among JEE rankers. A one-to-one mentorship programme was set up in collaboration with Saathi for JEE rakers to clarify their doubts about IIT Madras, provide information and clear myths. The programme mentored more than 90 rankers.
- Mental Health Campaign: A campaign was launched

in collaboration with Saathi to improve the mental health of the student community and provide exposure to the wellness facilities available at IITM.

- Social Media Engagement: General social media management (optimised Instagram to hit over 1k followers) and outreach initiatives to publicise the laurels of IIT Madras
- Outreach and publicity support: Support was extended to help sister cells of IAR Student Council reach the right audience in the right manner for their events.

#### **Other Initiatives**

- Photography Contest: Conducted a photography competition on World Photography Day, 19 August, with more than 100 participants trying for the Rs.4,000 prize money.
- Social Media: Two series of posts: 1. Madras Monday and 2. Filmy Friday were started. Madras Monday was focussed on posting photos of places in and around the institute, while Filmy Friday was focussed on the creative side, suggesting good movies through some quotes. Due to these two initiatives, the social media impression of the institute increased by 400%.

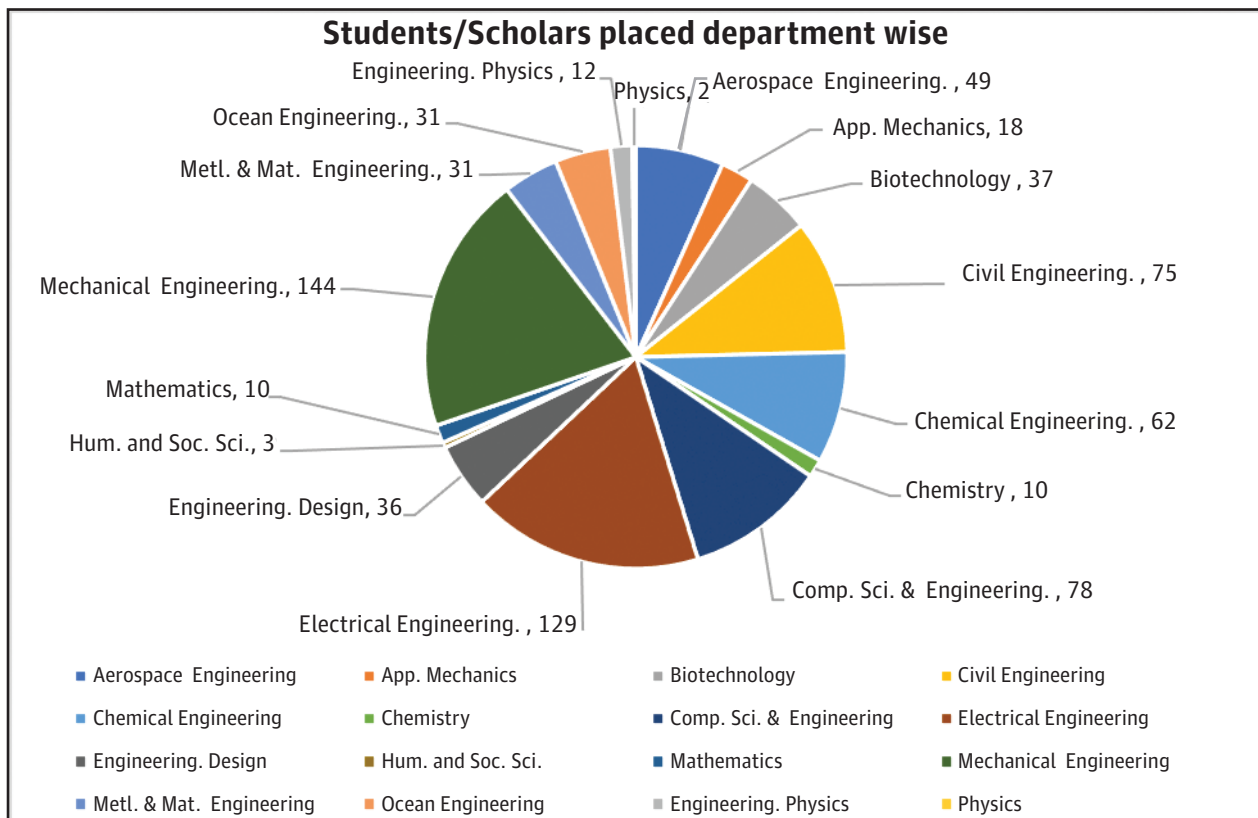
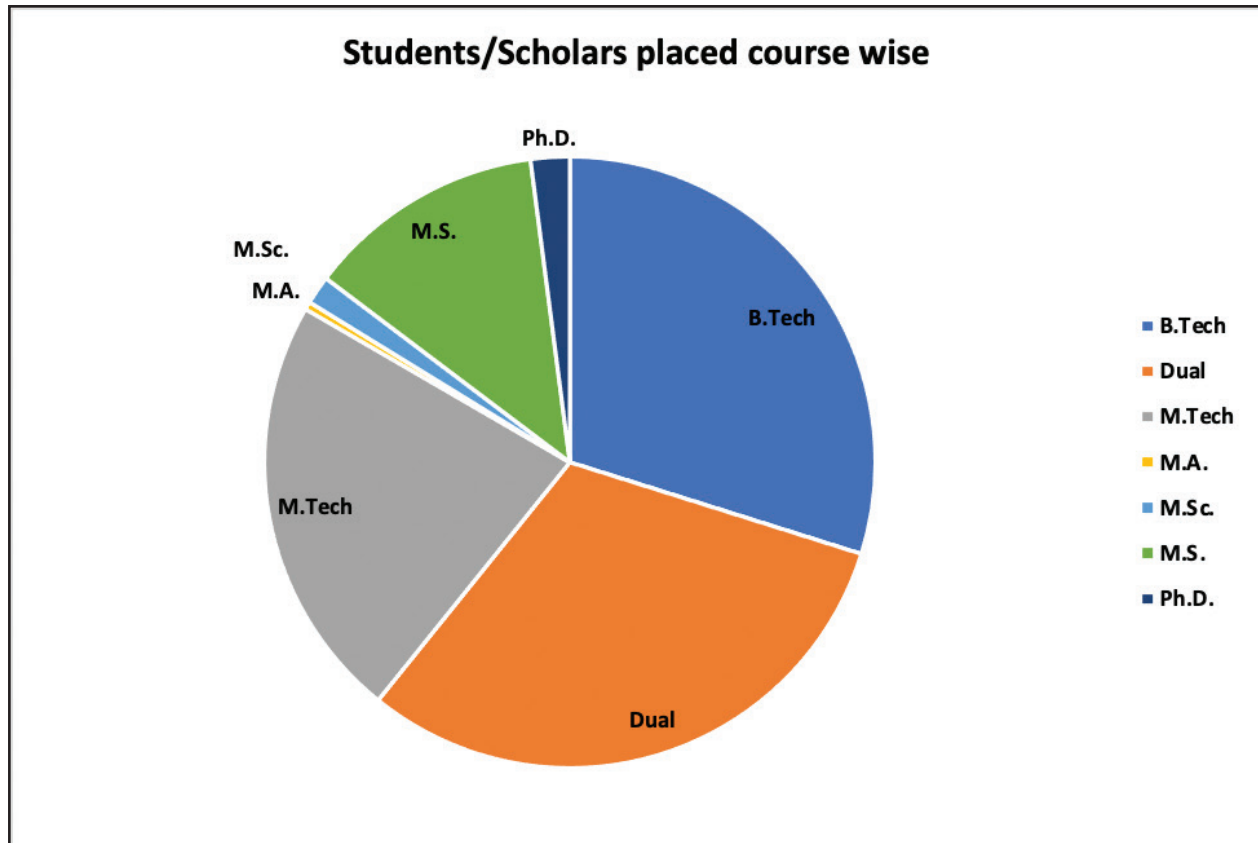
#### **Chennai36 Articles**

- Walking the walk with Taran Singh, Founder and CEO of Melvano; published on 17 July 2020
- Insti and Beyond with Mr Shiv Shivakumar and Reminiscing and Reflecting; published on 9 September 2020
- Art of the Deal: Music set for JEE, published on 26 June 2020
- Pushing the Limits with Prof Satya, published on 12 August 2020
- Article for CDC - Interview with Rohan Santosh, published on 20 September 2020





During the year, 869 students/scholars were placed in various organisations (excluding MBA).





## 11

## Financial Assistance to Students

Financial assistance in the form of scholarships and fellowships are given to meritorious students who are pursuing engineering, technology and science education at the institute. The details of scholarships and fellowships sanctioned to the students of different programmes during 2020-21 are given in this section.

### 11.1 Assistance to B.Tech /Dual Degree students

**Merit-cum-means scholarship:** Students admitted to B.Tech/Dual Degree programmes and whose parental income is less than Rs. 4.5 lakh were sanctioned MCM scholarship (Rs. 1000 per month). During the period, 371 students were benefitted under the scheme (Table 11.1 (b)).

Students with parental income less than Rs. 1 lakh are given tuition fee waiver. Students whose parental income is between Rs.1 lakh and Rs.4. 5 lakh are required to pay only Rs.33,333 per semester with a tuition fee waiver of Rs.66,666 per semester (i.e., one third of the tuition fee of Rs.1 lakh). These students are given reimbursement of the tuition fee paid by them,

i.e., Rs. 66,000 per year, by the Alumni office through various donors. During 2020-21, 151 students benefitted from such alumni-funded scholarships.

All SC/ST/PwD students are exempted from tuition fee of Rs.1,00,000 per semester. The SC/ST students admitted to B.Tech/Dual Degree programmes and with parental income less than Rs.4.5 lakh were given free messing, pocket allowance of Rs.250 p.m. and exemption from the payment of tuition fees and hostel seat rent. As on 31 March 2021, 92 students were benefitted under this (Table 11.1 (b)).

Alumni-funded scholarships for B.Tech/Dual Degree programmes were also sanctioned to General/OBC students with parental income above Rs.4.5 lakh based on their academic performance.

**Table 11.1 (a)**

S.No	Scholarships	Number of Students
1.	Ministry of Tribal Affairs, Government of India (National Fellowship Scheme for Higher Education of ST Students)	Renewal: 45 Fresh sanction: 20
2.	Ministry of Social Justice, Government of India (Top-class Education Scheme for SC Students)	Renewal: 18 Fresh sanction: 38

**Table 11.1 (b). Number of MCM and SC/ST scholarships**

Batch	MCM Scholarship	SC/ST Scholarship
2020	96	-
2019	92	38
2018	100	22
2017	83	32
Total	371	92

Top 7 per cent of the General category students admitted to B.Tech/DD programme are eligible for Notional Prize of Rs.1,000 (one time) and a Certificate of Merit based on their rank in JEE (Advanced) and parents' income exceeding Rs.4.5 lakh. In July 2020, 427 General category students were admitted to B.Tech/DD and 30 students were eligible for Notional Prize.

Alumni-funded scholarships are available to highest scoring students based on their academic performances, as proposed by the sponsoring alumni.

## 11.2 Other Scholarships

Scholarships were sanctioned by NCERT, Government of India and State Governments to meritorious students pursuing B.Tech programme in IIT Madras.

### State Government Scholarship obtained by B.Tech/DD students

Scholarship	Batch/Total Number of Students				Total
	2019	2018	2017	2016	
NCERT	14	12	10	5	41

## 11.3 M.Tech

Students who joined M.Tech programme through GATE were awarded Half-Time Teaching Assistantship (HTTA) at Rs.12,400 per month. During the period under report, 433 fresh assistantships and 1,077 renewed assistantships were given. The discipline-wise details of HTTA are given below.

### Number of HTTA awarded

S. No.	Discipline	Fresh -2020 Batch	Renewal 2020 batch	Renewal - 2019 batch	
		I Semester	January-May 2021	July-November 2020	January-May 2021
1	Aerospace Engineering	13	12	9	9
2	Applied Mechanics	14	12	16	16
3	Biotechnology - Clinical Engineering and Bioprocess	24	23	23	23
4	Chemical Engineering	41	28	56	55
5	Civil Engineering	53	35	23	22
6	Computer Science and Engineering	58	56	58	56
8	Electrical Engineering	62	43	57	56
9	Mathematics - Industrial Maths and Scientific Computing	20	19	19	19
10	Mechanical Engineering	81	58	49	48
11	Metallurgical and Materials Engineering	19	19	17	17
12	Ocean Engineering + Petroleum Engineering	37	36	27	26
13	Physics - Functional Materials and Nanotechnology	11	11	12	12
<b>Total</b>		<b>433</b>	<b>352</b>	<b>366</b>	<b>359</b>

### 11.3.1. M.Tech Dual Degree

The 2016 batch students who joined M.Tech programme under Dual Degree were awarded HTTA at Rs.12,400 per month from 1 August 2020 onwards based on their obtaining valid GATE score or on securing CGPA of 8.0 or above. During the period under review, 281 students were awarded fresh assistantships from August to December 2020, and 281 assistantships were renewed at the rate of Rs. 12,400 p.m. from 1 January-30 June 2021. The department-wise details are given below.

S. No.	Discipline	2016 Batch	
		Fresh (Ninth Semester)	Renewal (Tenth Semester)
1	Aerospace Engineering	18	18
2	Biotechnology	34	34
3	Chemical Engineering	31	31
4	Civil Engineering	19	19
5	Computer Science and Engineering	13	13
6	Electrical Engineering	32	32
7	Engineering Design	50	50
8	Mechanical Engineering	56	56
9	Metallurgical and Materials Engineering	10	10
10	Naval Architecture and Ocean Engineering	11	11
11	Physics	7	7
<b>Total</b>		<b>281</b>	<b>281</b>

### 11.4 M.Sc.

Students admitted to M.Sc programme were sanctioned Rs.1,000 p.m. merit scholarship as per rule. Exemption from payment of tuition fee was also given to certain students. During the period under report, 110 students benefitted. The department-wise details are given below:

#### Number of Merit Scholarship and Freeship Awarded

S. No.	Course	Merit Scholarship		Freeship (Tuition Fee Waiver)		50% Freeship (50% Tuition Fee Waiver)	
		1st Year	2nd Year	1st Year	2nd Year	1st Year	2nd Year
1.	Chemistry	15	17	6	6	3	7
2.	Mathematics	11	4	4	3	-	1
3.	Physics	12	10	5	5	1	-
<b>Total</b>		<b>38</b>	<b>31</b>	<b>15</b>	<b>14</b>	<b>4</b>	<b>8</b>

### 11.5 M.A.

Institute Merit Scholarship: Twenty-five per cent of the students admitted to M.A. programme and whose parental income is less than Rs. 4.5 lakh were sanctioned Merit Scholarship (i.e., exempted from payment of tuition fee of Rs. 3,000 per semester plus pocket allowance of Rs. 1,000 per month).

The SC/ST students admitted to M.A. programme with parental income less than Rs.4.5 lakh were sanctioned the concession of free messing plus pocket allowance of Rs.250 per month and exemption from payment of tuition fees and hostel seat rent as per Government of India post-matric scholarship rules.

Institute free studentship scholarships for M.A. programme were sanctioned to students, which comprises exemption from payment of tuition fees. The batch-wise details of the number of students benefitted are given below.

Batch	Merit Scholarship	SC/ST Scholarship
2019	0	0
2018	1	0
2017	1	0
2016	2	4
2015	2	1
Total	6	5

### 11.6 M.S.

The scholars admitted to M.S. programme through GATE are given Half-Time Teaching Research Assistantship (HTRA) of Rs 12,400 per month for two years and later extended to third year on the recommendation of General Test Committee. During the period under report, 397 scholars received these assistantships of which 181 were fresh scholars. The department-wise details of the assistantships awarded and renewed are given below.

#### Number of HTRA awarded

S. No.	Discipline	Fresh	Renewal	Total
1	Aerospace Engineering	20	14	34
2	Applied Mechanics	19	24	43
3	Biotechnology	2	7	9
4	Chemical Engineering	6	7	13
5	Civil Engineering	20	16	36
6	Computer Science and Engineering	18	18	36
7	Engineering Design	8	10	18
8	Electrical Engineering	39	35	74
9	Management Studies	2	13	15
10	Mechanical Engineering	29	50	79
11	Metallurgical and Materials Engineering	9	12	21
12	Ocean Engineering	9	10	19
Total		181	216	397

### 11.7 Ph.D.

The scholars admitted to Ph.D. full time programme in engineering are sanctioned Half-Time Teaching/Research Assistantship (HTRA) of Rs.31,000 per month for first two years and Rs.35,000 per month for next three years. During the period under report, 1,671 scholars obtained assistantships of which 318 were fresh scholars. The department-wise details of the assistantships awarded and renewed are given below.

## Number of HTRA awarded

S. No.	Discipline	Fresh	Renewal	Total
1	Aerospace Engineering	11	62	73
2	Applied Mechanics	23	110	133
3	Biotechnology	23	94	117
4	Chemical Engineering	21	74	95
5	Chemistry	13	89	102
6	Civil Engineering	37	126	163
7	Computer Science and Engineering	7	36	43
8	Engineering Design	8	39	47
9	Electrical Engineering	33	157	190
10	Humanities and Social Sciences	17	57	74
11	Management Studies	18	49	67
12	Mathematics	9	53	62
13	Mechanical Engineering	38	157	195
14	Metallurgical and Materials Engineering	12	85	97
15	Ocean Engineering	12	64	76
16	Physics	36	101	137
<b>Total</b>		<b>318</b>	<b>1353</b>	<b>1671</b>

A fellowship deemed to be equivalent to Institute Pre-Doctoral Fellowship (except contingency) will be awarded for a maximum period of six months from the date of submission of final synopsis with thesis for regular Ph.D. scholars who have submitted thesis within four and a half years and for direct/upgraded regular PhD scholars within five years. They will pursue the work as defined for Institute Pre-Doctoral Fellow. During the year under report, 50 Ph.D. scholars were sanctioned Pre-Doctoral Fellowship.

### 11.8 (a) Financial Assistance to Research Scholars for International Conferences

This institute is encouraging research scholars to present papers in international conferences for which they are given financial assistance. The financial assistance provided to M.S. and Ph.D. scholars is up to the limit of Rs.1,50,000, including registration fee.

### 11.8 (b) National Conference/Seminar/Symposium/Workshop/Visit to other laboratories, etc. within India

Research scholars are given the following financial assistance for presentation of papers in national conferences in India:

Claim	Eligibility
Registration fees	As per actuals, with the recommendation by DC/GTC
Travel	II Tier AC Train fare
Local Travel (at Chennai and at the place of conference)	Four trips for the duration of the conference by auto/taxi/bus at actuals, subject to an upper limit of Rs.500 per trip
Lodging	Hostel/Guest House/Hotel for conference days plus one day each prior to and after the conference days at actuals, subject to a ceiling of Rs.1,000 per day
Per diem	Rs.500 per day for conference days plus one day each prior to and after the conference days
Poster charges	Maximum amount of Rs.1,500 per poster (with bill)



## Weaker Section and Foreign National Students

### 12.1. B.Tech and Dual Degree programme

As per the Government of India (GoI) orders, 27%, 15% and 7.5% of seats are reserved for OBC, SC and ST students, respectively, in the B.Tech. and Dual Degree programme. These students are admitted through the Joint Entrance Examination (Advanced) with a relaxation. These students must get only 60% of the marks obtained by the last student of the General category to get qualified for admission. During counselling prior to admission, an advisor will explain to each student the requirements of different branches. This helps the students to choose a suitable branch based on their capability and interest.

### Economically Weaker Sections

As per GoI orders, for General category students from economically weaker sections (EWS) reservation is followed. For the academic year 2020-21, 10% reservation was given for EWS students under all programmes. The following table has the details of the number of SC/ST students admitted to B.Tech programme through JEE (Advanced) 2020-21 and Preparatory Course during 2019-20:

Total Sanctioned Intake	Sanctioned Intake			Number Joined Through							
				Programme	JEE			Preparatory Course			
	SC	ST	EWS		SC	ST	EWS	SC PD	ST	GE & EWS PD	OBC
B.Tech - 877	130	67	87	B.Tech	143	66	94	1	3	2	6
Dual Degree - 177	28	13	17	Dual Degree	26	5	18	-	1	1	-

### SC/ST students admitted against reservation are given the following benefits:

- Tuition fee waiver
- Free lodging and messing (basic menu only) and pocket allowance of Rs.250 per month, provided their parents' income is Rs.4,50,000 net per annum or less
- A Book Bank as part of Central Library is maintained for the benefit of SC/ST students. The students are issued 12 tickets for taking books from the Book Bank. Books are issued for a semester.
- Help in getting placement. Wherever possible, industries are requested to conduct separate interviews for SC/ST students, and the requirements for these students are lower than those for the general category.

### 12.2 Preparatory Course for admission to B.Tech/Dual Degree programme

A preparatory course of one academic year was initiated by the Ministry of Education, Government of India, exclusively for SC/ST/PwD students. Selection for this course is made from the Joint Entrance Examination (Advanced) list of SC/ST/PwD students who did not qualify for admission. Upon successfully completing the preparatory course at the IIT, these students would be eligible to join the B.Tech/Dual Degree programme and not be required to write the JEE (Advanced) again. Following are the details of admission in July 2020 (IIT Madras, IIT Hyderabad, IIT Tirupathi, IIT Palakkad):

Offer issued for PC				
SC PD	ST	OBC PD	GE PD	EWS PD
2	30	5	15	5

Fifteen preparatory course students of 2019-20 batch were admitted to B.Tech/Dual Degree programme in July 2020 after successfully completing the preparatory course.

### 12.3 M.Tech programme

Seats are reserved for SC, ST and EWS candidates as per the Government of India orders. They are admitted through GATE by a separate merit list. Following are the details of admission in July 2020:

Offer Issued			No. Joined (HTTA)		
SC	ST	EWS	SC	ST	EWS
76	38	51	74	38	59

### 12.4. M.Sc programme

Admission was made to the M.Sc. programme through Joint Admission test for Masters (JAM) entrance examinations only. Twenty SC and 11 ST students were admitted to the course and given tuition fee waiver.

M.Tech and M.Sc students admitted against reservation get the following benefits:

- Book Bank facility with 12 library tickets. Books are issued for a semester.
- Both public sector and private sector industries were requested to recruit SC and ST students. Other special steps were also taken to enhance the recruitment of these students.
- Scholarship is given to these students as per Gol norms.

### 12.5. Admission of Foreign National Students and Indian National Residing Abroad

In July 2016, one student joined the Dual Degree programme, and in July 2017, one student joined the Ph.D. programme. In July 2019, three students each joined the M.Tech and Ph.D. programme. In July 2020, two students joined the M.Tech programme.

At the end of March 2021, 10 foreign nationals were on the rolls of the institute. The programme and country-wise details are given below:

Country	I Year	II Year	III Year	IV Year	V Year	Total
<b>Foreign National Students</b>						
<b>Dual Degree</b>						
South Korea					1	1
M.Tech						
Bangladesh		2				5
Madagascar		1				
Afghanistan	1					
Nepal	1					
Ph.D.						
Ethiopia		2		1		4
Afghanistan		1				

Foreign students are also permitted to use the Book Bank. Book Bank Library tickets are issued to each student. Books are issued for a semester.

In addition, IIT Madras Alumni Association provides financial assistance to students under IITMAANA Travel grant programme to assist IITM students to visit USA and present their papers at nationally recognised technical conferences. The grant covers the airline ticket price and visa fees but excludes the payment of conference registration fees.



## 13

## Campus Amenities

### 13.1. Engineering Unit

The Engineering Unit (EU) is entrusted with the responsibility of construction, maintenance of buildings and operations and maintenance services of the institute. The works are carried out through contract by calling tenders and quotations in a transparent manner.

For maintaining the quality in construction of buildings, the advice of faculty members, who are experts in their respective areas, is sought. To complete the projects in time, the EU holds review meetings with the stakeholders periodically. The EU has also introduced new materials and technologies in construction and maintenance activities.

**The status of works (completed, in progress and in the planning stage) are as follows:**

#### Major works completed

S.No.	Description of Work	Value (Rs. In lakh)
<b>Executed by Engineering Unit</b>		
1.	Addition and alteration of D1 type quarters (D1-25 to D1-72) 45 units at IITM) SH: Phase I: D1-25 to D1-48, except D1-44, D1-46 and D1-48 (21 units)	423.00
2.	Repair and renovation of toilets in Biotechnology Building (Phase II)	62.00
3.	Augmentation works at Taramani Gate and widening of the road connecting Taramani Gate and Hostel Avenue Road in IIT Madras	41.00
4.	Renovation of Senate Room on fifth floor, Administration Building	40.00
5.	Waterproofing works of the terraces of Residential Zone buildings at IITM	33.90
6.	Cauvery Hostel repair works	19.20

**Major works in progress**

S. No.	Description of Work	Value (Rs. in lakh)
<b>Executed by Engineering Unit</b>		
1	Integration of In & Out gates	
1.1	Civil works	270.51
1.2	Gate automation with boom barriers	73.49
2.	Recarpeting of major roads in the IITM campus	333.00
3.	Renovation of toilets and replacing the damaged sunshades in ESB and MSB	253.50
4.	External painting of Academic Zone buildings	216.00
5.	Renovation of toilets in Open Air Theater (OAT)	152.00
6.	Installation of video walls at three more locations in IIT campus	129.00
7.	Renovation of toilets on all the floors in the Administration building	131.00
8.	Repair and renovation of the basement floor of Central Library	129.00
9.	Waterproofing works in AZ buildings	100.00
10	Creation of gathering space at campus café terrace portion	
10.1	Civil works	77.07
10.2	Tensile roofing structure	77.05
10.3	Provision of AHUs and extension of chilled water lines	42.12
10.4	Providing light fittings, fans and power points	9.00
11.	Creation of emergency staircase at OED, replacing AC cement sheet with cement fiber sheets in Chemical Engineering workshop bay, development of parking facility in Velachery Gate	57.00
12.	Construction of electrical substation for ESB building	50.00
13.	Fabric roof structure above the office of Dean (Students)	22.00
14.	Bus Bar Trunking (BBT) for ESB and MSB	221.00
15.	BBT for Chemistry second floor and BSB	149.00
16.	Installation of video wall near In & Out Gate	15.00
17.	Streetlight for In & Out Gate	13.00
18.	Exhaust system at ESB and MSB toilets	12.00
19.	Face-lifting of Cauvery Hostel	450.00
20.	External painting of Hostel Zone buildings	292.00
21.	Renovation of BEGH	110.00
22.	Renovation of toilets in Student Activity Centre (SAC) Building	83.00
23.	Constructing emergency escape staircases in Cauvery and Krishna hostels	48.00
24.	Addition and alteration of DI type quarters (D1-25 to D1-72) 45 units at IITM) SH: Phase II: D1-49 to D1-72 (24 units)	455.48
25.	Renovation of TGH	383.00
26.	Revamping the electrical installation in the guestrooms of Taramani Guest House, IIT Madras	78.50
<b>Executed by the EU Unit under Higher Education Financing Agency (HEFA)</b>		

S. No.	Description of Work	Value (Rs. in lakh)
1.	Construction of Annex building (G+3) at the existing Computer Science and Engineering (CSE) building	2180.00
2.	Construction of Electrical Science Block-II (ESB-II) Ground+6 floors	2908.00
3.	Construction of 64 nos. of G1 type quarters for married research scholars	2205.00
4.	Upgradation of existing sewerage system at IIT Madras	3458.00
5.	Upgradation of water supply system at IIT Madras campus	3700.00
6.	Construction of girls' hostel by replacing the existing rear wing of Sarayu Hostel	4264.00
<b>Executed by CPWD under HEFA</b>		
1.	Construction of New Academic Complex-II	18770.00
2.	Construction of new hostel (1,200 rooms) by replacing the existing Mandakini hostel	14675.00
<b>Executed by CPWD and funded by the Ministry of Shipping</b>		
1.	Construction of Port Centre in Thaiyur Campus	2700.00
<b>Executed by the Engineering Unit Under Fund From "OH-35 Towards Infrastructure Development Due to Implementation of EWS Reservation"</b>		
1.	Augmentation of facilities at CFI lab by completely replacing the existing structure in Central Workshop at IIT Madras	2430.00

### Major works to be executed in 2021-22

S.No.	Description of Work	Value (Rs. in lakh)
<b>Execution by EU, IITM</b>		
1.	Addition and alteration of E1 type quarters (E1-23, E1-24, E1-25) 36 units at IIT Madras	484.00
2.	Tiling of new wing rooms, providing cupboard shutters, internal painting and corridor tiling of Krishna Hostel	275.00
3.	BBT for HSB	221.00
4.	Waterproofing treatment to sloped roof at Himalaya Mess in IIT Madras	77.00
5.	Providing additional aluminum sheet roofing over the existing roofing at Sports Complex building in IIT Madras	75.00
6.	Monkey-proofing works in girls' hostels	25.00
<b>Execution by CPWD</b>		
1.	Proposed Thaiyur Campus Phase-I development works	
1.1	Construction of Academic Research Block (G+2)	3441.00
1.2	Construction of Hostel Block (G+4)	1877.00
1.3	Construction of Utilities and Common services	3846.00

### 13.2. Housing facilities

The campus of IIT Madras has 545 faculty quarters, 434 staff quarters and 222 students' quarters for accommodation. There are 137 servant quarters in the campus as well.

### 13.3. Horticulture

The horticulture unit is functioning under the EU. It maintains 56,702 sqm of lawns (39,358 sqm of lawns at various locations and 17,344 sqm of turf in stadiums and play fields). No chemical pesticide sprays are advocated anywhere within the campus (only Azadirachtin 10,000 ppm sprays are used, when necessary, to control pests beyond Economic Threshold Level or ETL), and vermicompost is used as the sole nutritional supplement.

Miyawaki gardens that were developed adjacent to the newly constructed housing complexes (Chera, Chola and Pandya) are currently being maintained to improve the green cover in a considerably shorter time.

The horticulture section also takes care of providing water troughs at 70 locations for institute's cervid population (blackbuck and spotted deer). The water containers are cleaned and refilled daily. These containers also feed a whole lot of smaller fauna within the campus such as bonnet macaque, squirrels and birds.

### 13.4. Public health

The horticulture section takes care of the prevention of mosquito-breeding grounds and control of larval and adult mosquitos through benign sprays and fumigation. It also takes care of termite control within the campus.

The campus has solid waste management through safe disposal of garbage. Hazardous waste is collected from various departments and disposed as per protocol through Tamil Nadu Waste Management Company Limited.

### 13.5. Telephone facilities: PBX telephone system

The campus telephone facility has been extended to the office and residential quarters of faculty members, laboratories of various departments, and miscellaneous services from HiPath 4000 ISDN PBX system with 5000-line capacity interfaced with BSNL through ISDN PRA lines. There are 20 remote telephone systems housed at various buildings in Academic, Hostel and Residential Zones connected to the main PBX system via optical fiber link. The complaints of campus telephone lines are attended within two hours from the time of receipt/registration. Online campus telephone directory

is available on the institute website under tab - Directory <https://iitm.ac.in/directory>

### 13.6. Local body approval

Chennai Metropolitan Development Authority (CMDA) has approved 21 buildings in the campus. Plans for other buildings constructed and under construction in the campus have been submitted to the CMDA and are under approval.

### 13.7. Central Supplies Unit

The Central Supplies Unit functions under the administration of a warden. The unit procures milk from Tamil Nadu Cooperative Milk Producers' Federation (TCMPF) and supplies to hostels. It procures major items from wholesale suppliers through Provision Selection Committee and Provision Purchase Committee, and supplies them to hostels, thus, economising the mess expenses. Branded cosmetics and eatables from wholesale dealers are other items procured and made available to students through Students Amenities Centres at reduced prices.

### 13.8. Hospital

The institute hospital is a 25-bedded primary to secondary hospital, which caters to the health need of the students, staff and their dependents.

The hospital working hours are

Weekdays : 08.15 am - 05.45 pm  
Saturday : 08.15 am - 1.00 pm  
Saturday : 1.00 pm onwards: Emergency care

Sunday and Government holidays: Emergency care

### Staff

High-quality ethical care is given to all users by a dedicated team of hospital staff, which include

1) Regular doctors	- 11
2) Visiting consultants	- 22
(since the pandemic began, only eight consultants started consultation from October 2020)	
3) Nurses	- 14
4) Nursing Assistants (female)	- 6
5) Nursing Assistants (male)	- 3
6) Reception/MRD	- 3
7) X-ray/U/S/ECG Technician	- 2
8) Hospital Office	- 2
9) Office attenders	- 2
10) Hospital storekeeper	- 1
11) Consultant (Finance)	- 1

### Facilities available

- 1) Pharmacy - Outsourced to Apollo
- 2) Clinical lab - Outsourced to Lister Metropolis

3) Physiotherapy - Outsourced to M/s. Indus Therapeutic Solutions (temporarily closed due to COVID-19)

### In-house facilities

- 1) ECG
- 2) X-ray Unit
- 3) Well-equipped labour room with a baby warmer
- 4) Operation theater (since the pandemic began, the theater is not in use)
- 5) Inpatient wards

### Academic activities

To update the hospital staff of the hospital activities, a meeting of all staff is held on alternate months. A medical topic of common interest is also discussed. Doctors and staff nurses are encouraged to take part in CME and medical conferences through webinars.

### Clinical activities

- 1) Regular medical camps are conducted to screen users for chronic ailments.
- 2) Every year, a medical camp is held for all women in March. Due to the pandemic, the camp was cancelled.
- 3) Regular outpatient clinics are where patients of various health-related problems are consulted. In case a specialist opinion is required, the patients are appropriately referred either within the hospital or outside as per the requirement.
- 4) Immunisation is carried out on second Saturday and fourth Friday every month. The Universal Immunisation Schedule as per the Government of India is followed for children. Adult immunisation and booster doses are also given as and when required. In case of epidemic, mass immunisation is also done.
- 5) Screening of employees and their dependents for chronic ailments, especially for those above 40 years are done on an outpatient basis. High-risk patients and those with strong genetic risk are screened earlier or whenever necessary.

### April 2020

Since the lockdown from 25 March 2021, the institute hospital got itself equipped to face the pandemic.

### General precautions

1. Posters/Pamphlets on safety measures were displayed and given to all departments.
2. Announcements was made through mail highlighting the safety protocols (importance of face mask, hand hygiene and physical distancing) and what to do in the event of medical problems.
3. Staff and students were advised to undertake only urgent essential travel.

### Specific

- ❖ Hospital services were open only to emergency services
- ❖ Doctors and staff were posted on rotation to manage the emergencies 24×7.
- ❖ Regular repeat medicines were issued through email request. It was streamlined as per the need.
- ❖ Strict hand hygiene and masking was insisted in the hospital premises.
- ❖ Protocol for fever management was written with the help of Apollo
- ❖ PPE protocols were written and adequate supplies were stocked.

### May 2020

Regular monitoring of safety measures in hospital and departments

### June 2020

Screening of outsourced staff for RT-PCR was initiated with Chennai Corporation.

### July 2020

Scholars who were completing or near completion of their courses were called in batches. They were quarantined in Guest House for two weeks, tested for COVID-19 RT-PCR, and later permitted to resume their academic activities.

### August 2020

Strict safety protocols to prevent COVID-19 infection was initiated in labs/departments

- ❖ A COVID-19 care centre was run by the Tamil Nadu Government through Chennai Corporation in Mahanadi Hostel. IIT students/staff requiring isolation were admitted there.
- ❖ As per the Government guidelines, a separate entrance and OP facility for fever patients was created in the post-operative ward.

### December 2020

There was an outbreak of COVID-19 infection in the Student's Hostel Zone, which was efficiently managed by mass screening and following strict safety measures. A temporary isolation facility was created in the Hostel Zone and monitoring was done by institute hospital along with outsourced staff.

### Special administrative activities

- ❖ Hospital Review Board takes care of the administrative matters of the institute staff such as appointments special medical leave, exemption, allotment of quarters and hostels accommodations on medical grounds.
- ❖ Hospital Advisory Committee with representatives from all sections of the institute staff and students meets on the first Friday once in three months.

**April 2020-March 2021 COVID-19 Positive Cases**

Month	Employee	Employee Dep	Student	Student Dependents	Project	Retired Employees and Dependents	Others	Total
May 2020	1	0	0	0	1	0	0	2
June 2020	1	2	2	1	1	0	2	9
July 2020	4	10	0	0	1	0	6	21
August 2020	12	13	2	0	0	0	4	31
September 2020	9	14	3	1	4	2	4	37
October 2020	7	8	4	0	4	0	3	26
November 2020	6	7	4	0	1	5	1	24
December 2020	0	2	204	0	1	0	17	224
January 2021	1	6	1	1	0	0	2	11
February 2021	2	2	4	1	0	0	0	9
March 2021	6	8	4	0	4	0	1	23
<b>Total</b>	<b>49</b>	<b>72</b>	<b>228</b>	<b>4</b>	<b>17</b>	<b>7</b>	<b>40</b>	<b>417</b>

**March 2021 COVID-19 Number of Vaccinations**

Date	Total
3 March 2021	70
4 March 2021	90
5 March 2021	88
6 March 2021	88
8 March 2021	77
9 March 2021	68
10 March 2021	34
13 March 2021	80
17 March 2021	120
25 March 2021	100
26 March 2021	80
29 March 2021	60

### 13.9. Guest House

The institute has two guest houses within the campus: the Bose-Einstein Guest House near the Administrative Building and Taramani Guest House (TGH) in the Hostel Zone. The Bose-Einstein Guest House has 18 air-conditioned suites. Each room has a telephone, fridge and TV. VIPs, institute guests and invited guests are usually accommodated here. TGH has 83 rooms, of which 18 are suites and 65 are air-conditioned rooms. The guest house provides board and lodging facilities for institute guests and visitors, newly appointed faculty members, staff members, delegates and participants attending conferences, seminars, symposia and workshops.

### 13.10. Bank

The State Bank of India has a branch and two ATMs on campus. Canara Bank also has a branch and an ATM facility within the institute. In addition, ICICI Bank has installed an ATM in the Hostel Zone.

### 13.11. Post office and telecom centre

There is a post office on campus to cater to the needs of the campus community. A 24-hour telecom centre caters to the needs of the employees, students and residents.

### Schools

Vana Vani Matriculation Higher Secondary School (VVMHSS), administered by the IIT Madras Educational Trust, and a Kendriya Vidyalaya (KV) function on campus. VVMHSS offers courses from LKG to class 12 and the KV offers courses from class 1 to 12.

### Open-Air Theatre

The Open-Air Theatre is used by the Film Club to screen films during weekends. It is also used for other functions of the institute and schools.

### Student Activities Centre

This building is used by students for indoor games. Important functions such as convocations and orientation programmes for freshers are also conducted here.

### Cafeteria

There are two canteens, the IIT Staff Canteen and the IRTC restaurant, on campus to cater to the needs of employees and students.

### Crèche

A crèche is functioning on the campus for the benefit of the staff and working women. There were about 157 children in the crèche during the period under report.

### Transport services

The institute has eight Lynx buses that provide transport facilities to the staff, students and residents of the campus. Transport facilities are also available for official work.

## SECURITY SECTION

### Introduction

The Security Section of Indian Institute of Technology is an important constituent of the institute, because it is vested with the task of ensuring the security of men and materials on the campus. The section is also responsible for maintaining peace and ensuring harmonious co-existence of campus residents. As a part of support service, it is on call of the campus residents for various types of emergencies and contingencies, which may adversely affect the normal life of the campus.

The security policy of IIT Madras is that core security functions and areas will be manned by IIT's own security personnel and the allied security functions and areas will be outsourced and coordinated by the institute personnel. The institute has also been progressively introducing greater automation. The current year has been eventful and rewarding too in changing over from manual to automated QR code gate passes issued particularly to visitors after capturing their photos and noting their vehicle details.

This section mainly focuses on the following areas:

- a) The foremost responsibility of the Security Section is to protect institute property and safety of campus residents.
- b) Regulating men and materials through all the gates
- c) Traffic management and diversions on need basis
- d) Zone-wise patrolling of the campus area, including perimeter wall.
- e) Maintenance of fire protection systems, fire preventions, periodical checking/testing of fire hydrants, fire extinguishers and fire detection and alarm systems
- f) Conducting training on fire safety to students, staff, faculty and school children.
- g) Conducting fire and evacuation drill at high-rise buildings
- h) Coordination with law enforcement agencies
- i) Implementing the guidelines of COVID-19 precautions issued by the Government of India, Tamil Nadu Government and institute.

### Regulating men and materials

The Security Section is vested with the task of ensuring the security of men and materials on the campus by issuing passes for vehicles and ID cards for contractors and their workers. The material gate pass system is in place to allow materials after verifying



the specimen signatures. Apart from issuing passes, the token system is also being used at certain gates. The section has also introduced a hand-held tablet system for issuing QR code gate passes by capturing photos of visitors and their vehicles at the gates.

### Traffic management

The Security Section is vested with the task of ensuring proper traffic management since the campus has been housed with two schools, Tech Kids and other facilities. The section manages the traffic by diverting vehicles and ensuring speed limits using scientific gadgets (laser speed gun) to bring down the number of accidents in the campus. There were no major accidents in the campus during the period under report.

### Patrolling

To have an effective patrolling, the entire campus has been divided into three zones, i.e., Institute Zone, Residential Zone and Hostel Zone. Patrolling of perimeter wall is also important and is being carried out by foot and vehicles to check the physical condition of the wall and for any security breach.

### Maintenance of fire equipment and fire prevention systems

Periodical servicing of fire protection systems installed in the buildings is carried out with the objective of keeping readiness at all the time to control any fire incidents. There are more than 2,500 fire extinguishers of different types and capacities installed in the campus in addition to a fixed fire protection system i.e., sprinklers, wet risers and downcomers in addition to yard hydrants around the high-rise buildings. Fire detection and alarm systems exist in highly sophisticated and delicate electrical and electronic equipment, computer centres, NCCRD, Biotech Phase I and II. Monthly and quarterly checking of these systems is carried out with the EU to check their efficiencies and records are maintained with Security Section.

### Independence Day Celebrations

The 74th Independence Day was celebrated in the institute on 15 August 2020 at Administration building.

### Republic Day Celebrations



The 72nd Republic Day was celebrated in the institute on 26 January 2021 at Administration building. As a part of celebration, the Institute Security Personnel participated in the ceremonial parade with Vana Vani band team. The ceremonial parade was commanded by the Chief Security Officer Shri N. Elumalai and seconded by Assistant Security Officer Mr K.C. Scariya.



### COVID-19

#### National Level Lockdown

During the phase-wise lockdowns, it was ensured that security deployment was as per government guidelines with instructions to facilitate entry and exit of faculty, research scholars, project staff, essential services and emergency/hospital services for campus residents only, among others.

### Introduction of digitalised access control e-pass system for visitors and their vehicles

On 9 January 2021, an electronic pass system was introduced at the Main gate to record and issue printed QR code entry passes to visitors on a trial basis. Instead of the manual entry in record books, the visitors were issued photos captured at the Entry with electronic tablet phones. It also allows the institution to track who is on the premises in real-time and why they are there.

### Perimeter surveillance and use of drone

An improvised watch tower has been set up to keep vigil on the perimeter wall. Security guards have been deployed round the clock with wireless sets. The guards constantly monitor lakes 1 and 2, perimeter wall and forested areas. Using drones, a video was captured with high-definition cameras, covering the densely forested areas, perimeter wall and lake areas during the lockdowns.

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## Finance and Account

The financial year of the institute corresponds with that of the Government of India (1 April to 31 March of the following year). The accounts of the institute are annually audited by Office of the Principal Director of Audit (Central), Chennai on behalf of the Comptroller and Auditor General of India.

The 91st Finance Committee of the institute, in its meeting held on 4 December 2020, recommended revised estimates of Rs.710.75 crore (gross) and budget estimates of Rs.910.00 crore (gross) for the financial year 2020-21 under revenue expenditure head. The committee also recommended a revised estimate of Rs.49.00 crore and budget estimates of Rs.75.00 crore for 2021-22 under capital expenditure. The estimates were approved by the Board of Governors of the institute in their 247th meeting held on 4 December 2020.

The following is a summary of the revised estimates for 2020-21 and budget estimates for 2021-22 under revenue expenditure and capital expenditure, as approved by the Board of Governors of the institute in their 247th meeting held on 4 December 2020.

(Figures in crore of Rs.)

Item	Budget Estimate 2020-21	Revised Estimate 2020-21	Budget Estimate 2021-22
<b>Grant under OH-36 and OH-31</b>			
<b>Institute income projected</b>	<b>88.00</b>	<b>50.00</b>	<b>88.00</b>
Grant projected for salary (OH-36)	330.00	303.50	366.00
Grant projected for pension and pensionary benefits (OH-31)	118.00	118.00	132.00
Grant for scholarships (OH-31)	124.00	115.00	130.00
Grant for non-salary component (OH-31)	299.00	174.25	282.00
<b>Grant expected under OH-36 and OH-31</b>	<b>871.00</b>	<b>710.25</b>	<b>910.00</b>
<b>Grant under OH-35</b>			
Grant projected for asset creation	100.00	49.00	75.00
<b>Grant expected under OH-35</b>	<b>100.00</b>	<b>49.00</b>	<b>75.00</b>

## Audit

The annual accounts of the institute for 2019-20 were audited by the Office of the Principal Director of Audit (Central), Chennai during July-August 2020, and a certified copy of the annual accounts with the audit report was sent to Ministry of Education after the annual accounts were duly adopted by the Board of Governors of the institute on 4 December 2020 to enable the Ministry to arrange for placing the same before both the Houses of Parliament during the winter session.

## Summary of provisional revenue and capital grant utilisation for 2020-21 (Figures in crore of Rs.)

Item	Amount
<b>Grant under OH-35</b>	
Opening balance	16.34
Grant received under OH-35	110.38
<b>Total funds available under OH-35</b>	<b>126.72</b>
<b>Expenditure under OH-35</b>	
Building and electrical installation	38.06
Academic equipment	57.35
Equipment for specialised centre	-
Infrastructure (furniture/computers, etc.)	11.13
Periodicals/journals/books for library	21.23
<b>Total expenditure under OH-35</b>	<b>127.77</b>
<b>Grant under OH-31 and OH-36</b>	
Opening balance	-4.79
Grant received under OH-31 and OH-36	625.46
Institute Income	88.81
<b>Total funds available under OH-31 and OH-36</b>	<b>709.48</b>
<b>Expenditure under OH-31 and OH-36</b>	
Salary and related items (OH-36)	246.03
Pension and other terminal benefits (OH-31)	103.97
Scholarship payments (OH-31)	93.11
Non-salary, non-pension items (OH-31) (Other components)	150.08
<b>Total expenditure under OH-31 and OH-36</b>	<b>593.19</b>

The balance of the Corpus Fund as on 31 March 2021 was Rs. 367.43 crore and the balance of the Institute Endowment account as on 31 March 2021 was Rs.150.89 crore.

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## Publications

### Papers published in national and international journals

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## 16

## Appendix 1. The Senate

S. No.	Name	Department
1.	Prof. Amit Kumar	Aerospace Engineering
2.	Prof. Luoyi Tao	Aerospace Engineering
3.	Prof. Murthy Haradanahalli S N	Aerospace Engineering
4.	Prof. Ramakrishna P A	Aerospace Engineering
5.	Prof. Sriram P	Aerospace Engineering
6.	Prof. Velmurugan R	Aerospace Engineering
7.	Prof. Bhaskar K	Aerospace Engineering
8.	Prof. Nandan Kumar Sinha	Aerospace Engineering
9.	Prof. Ramakrishna M	Aerospace Engineering
10.	Prof. Sameen Abdulvahab	Aerospace Engineering
11.	Prof. Sivasambu Mahesh	Aerospace Engineering
12.	Prof. Sujith R I	Aerospace Engineering
13.	Prof. Sunetra Sarkar	Aerospace Engineering
14.	Prof. Muruganandam T M	Aerospace Engineering
15.	Prof. Anuradha Banerjee	Applied Mechanics
16.	Prof. Arockiarajan A	Applied Mechanics
17.	Prof. Arul Prakash K	Applied Mechanics

S. No.	Name	Department
18.	Prof. Arun Kumar Thittai	Applied Mechanics
19.	Prof. Lakshmana Rao C	Applied Mechanics
20.	Prof. Mahesh Panchagnula	Applied Mechanics
21.	Prof. Prasad Patnaik B S V	Applied Mechanics
22.	Prof. Ramakrishnan Swaminathan	Applied Mechanics
23.	Prof. Ramasubba Reddy M	Applied Mechanics
24.	Prof. Ramesh K	Applied Mechanics
25.	Prof. Sayan Gupta	Applied Mechanics
26.	Prof. Sujatha Narayanan Unni	Applied Mechanics
27.	Prof. Sarith P Sathian	Applied Mechanics
28.	Prof. Vengadesan S	Applied Mechanics
29.	Prof. Sivakumar M	Applied Mechanics
30.	Prof. Baburaj A P	Applied Mechanics
31.	Prof. Manivannan M	Applied Mechanics
32.	Prof. Amal Kanti Bera	Biotechnology
33.	Prof. Baskar R	Biotechnology
34.	Prof. Gopala Krishna Aradhyam	Biotechnology
35.	Prof. Guhan Jayaraman	Biotechnology

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36.	Prof. Kesavan V	Biotechnology
37.	Prof. Mahalingam S	Biotechnology
38.	Prof. Michael Gromiha M	Biotechnology
39.	Prof. Nitish R Mahapatra	Biotechnology
40.	Prof. Rayala Suresh Kumar	Biotechnology
41.	Prof. Suraishkumar G K	Biotechnology
42.	Prof. D Karunakaran	Biotechnology
43.	Prof. Chandraraj K	Biotechnology
44.	Prof. Madhulika Dixit	Biotechnology
45.	Prof. Rama Shankar Verma	Biotechnology
46.	Prof. Sanjib Senapati	Biotechnology
47.	Prof. Sathyanarayana Naidu G	Biotechnology
48.	Prof. Srinivasa Chakravarthy V	Biotechnology
49.	Prof. Subramaniam K	Biotechnology
50.	Prof. Alagusundaramoorthy P	Civil Engineering
51.	Prof. Amlan Kumar Sengupta	Civil Engineering
52.	Prof. Ashwin Mahalingam	Civil Engineering
53.	Prof. Balaji Narasimhan	Civil Engineering
54.	Prof. Benny Raphael	Civil Engineering
55.	Prof. Bhairavavajjala Nageswara Rao	Civil Engineering
56.	Prof. Boominathan A	Civil Engineering
57.	Prof. Dodagoudar G R	Civil Engineering
58.	Prof. Koshy Varghese	Civil Engineering
59.	Prof. Lelitha Devi Vanajakshi	Civil Engineering
60.	Prof. Ligy Philip	Civil Engineering
61.	Prof. Manu Santhanam	Civil Engineering
62.	Prof. Meher Prasad A	Civil Engineering
63.	Prof. Murali Krishnan J	Civil Engineering

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64.	Prof. Murthy B S	Civil Engineering
65.	Prof. Murty C V R	Civil Engineering
66.	Prof. Ramamurthy K	Civil Engineering
67.	Prof. Raghukanth S T G	Civil Engineering
68.	Prof. Rajagopal K	Civil Engineering
69.	Prof. Ravindra Gettu	Civil Engineering
70.	Prof. Robinson R G	Civil Engineering
71.	Prof. Saravanan U	Civil Engineering
72.	Prof. Shiva Nagendra S M	Civil Engineering
73.	Prof. Sivanandan R	Civil Engineering
74.	Prof. Srinivasan K	Civil Engineering
75.	Prof. Thyagaraj T	Civil Engineering
76.	Prof. Veeraragavan A	Civil Engineering
77.	Prof. Appa Rao G	Civil Engineering
78.	Prof. Arul Jayachandran Sanjeevi	Civil Engineering
79.	Prof. Devdas Menon	Civil Engineering
80.	Prof. Indumathi Manivannan Nambi	Civil Engineering
81.	Prof. Karthik K Srinivasan	Civil Engineering
82.	Prof. Mohan S	Civil Engineering
83.	Prof. Ramamurthy K	Civil Engineering
84.	Prof. Sathish Kumar S R	Civil Engineering
85.	Prof. S R Gandhi	Civil Engineering
86.	Prof. Abhijit P. Deshpande	Chemical Engineering



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87.	Prof. Arun K Tangirala	Chemical Engineering
88.	Prof. Kannan A	Chemical Engineering
89.	Prof. Nagarajan R	Chemical Engineering
90.	Prof. Raghuram Chetty	Chemical Engineering
91.	Prof. Ragunathan Rengasamy	Chemical Engineering
92.	Prof. Rajagopalan Srinivasan	Chemical Engineering
93.	Prof. Ramanathan Srinivasan	Chemical Engineering
94.	Prof. Ravi R	Chemical Engineering
95.	Prof. Sreenivas Jayanti	Chemical Engineering
96.	Prof. Sridharakumar N	Chemical Engineering
97.	Prof. Tanmay Basak	Chemical Engineering
98.	Prof. Niket Satish Kaisare	Chemical Engineering
99.	Prof. Preeti Aghalayam	Chemical Engineering
100.	Prof. Ravi Krishna R	Chemical Engineering
101.	Prof. Shankar Narasimhan S	Chemical Engineering
102.	Prof. Susy Varughese	Chemical Engineering
103.	Prof. Upendra Natarajan	Chemical Engineering
104.	Prof. Chandrasekhar C	Computer Science
105.	Prof. Deepak Khemani	Computer Science
106.	Prof. Hema A Murthy	Computer Science
107.	Prof. Madhu Mutyam	Computer Science
108.	Prof. Nandivada Venkata Krishna	Computer Science
109.	Prof. Narayanaswamy N S	Computer Science

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110.	Prof. Siva Ram Murthy C	Computer Science
111.	Prof. Sreenivasa Kumar P	Computer Science
112.	Prof. Sukhendu Das	Computer Science
113.	Prof. Anurag Mittal	Computer Science
114.	Prof. Kamakoti V	Computer Science
115.	Prof. C.Pandu Rangan	Computer Science
116.	Prof. Arti Dua	Chemistry
117.	Prof. Bhyrappa P	Chemistry
118.	Prof. Dillip Kumar Chand	Chemistry
119.	Prof. Edamana Prasad	Chemistry
120.	Prof. Govindasamy Sekar	Chemistry
121.	Prof. Indrapal Singh Aidhen	Chemistry
122.	Prof. Mangala Sunder K	Chemistry
123.	Prof. Mishra A K	Chemistry
124.	Prof. Muraleedharan K M	Chemistry
125.	Prof. Narasimha Murthy N	Chemistry
126.	Prof. Pradeep T	Chemistry
127.	Prof. Rajakumar B	Chemistry
128.	Prof. Ramesh L Gardas	Chemistry
129.	Prof. Ranga Rao G	Chemistry
130.	Prof. Sankararaman S	Chemistry
131.	Prof. Sangaranarayanan M V	Chemistry
132.	Prof. Sanjay Kumar	Chemistry
133.	Prof. Sundargopal Ghosh	Chemistry
134.	Prof. Vidyasaga K	Chemistry
135.	Prof. Archita Patnaik	Chemistry
136.	Prof. Baskaran S	Chemistry
137.	Prof. Dhamodharan R	Chemistry
138.	Prof. Selvam P	Chemistry
139.	Prof. Asokan Thondiyath	Engineering Design
140.	Prof. Nilesh J. Vasa	Engineering Design
141.	Prof. Ramanathan M	Engineering Design



S. No.	Name	Department
142.	Prof. Saravana Kumar G	Engineering Design
143.	Prof. Shankar Ram C S	Engineering Design
144.	Prof. Srikanth Vedantam	Engineering Design
145.	Prof. Venkatesh Balasubramanian	Engineering Design
146.	Prof. Krishnakumar R	Engineering Design
147.	Prof. Rengaswamy Jayaganthan	Engineering Design
148.	Prof. Amitava Dasgupta	Electrical Engineering
149.	Prof. Andrew Edwin Raj T	Electrical Engineering
150.	Prof. Anil Prabhakar	Electrical Engineering
151.	Prof. Anjan Chakravorty	Electrical Engineering
152.	Prof. Aravind R	Electrical Engineering
153.	Prof. Bijoy Krishna Das	Electrical Engineering
154.	Prof. Bobby George	Electrical Engineering
155.	Prof. Arunkumar D Mahindrakar	Electrical Engineering
156.	Prof. Jhunjhunwala A	Electrical Engineering
157.	Prof. S. Christopher	Electrical Engineering
158.	Prof. Deepa Venkitesh	Electrical Engineering
159.	Prof. Devendra Jalihal	Electrical Engineering
160.	Prof. Enakshi Bhattacharya	Electrical Engineering
161.	Prof. Giridhar K	Electrical Engineering
162.	Prof. Harishankar Ramachandran	Electrical Engineering
163.	Prof. Jagadeesh Kumar V	Electrical Engineering
164.	Prof. Kalyan Kumar B	Electrical Engineering

S. No.	Name	Department
165.	Prof. Karmalkar S	Electrical Engineering
166.	Prof. Krishna Vasudevan	Electrical Engineering
167.	Prof. Nagendra Krishnapura	Electrical Engineering
168.	Prof. Nandita Dasgupta	Electrical Engineering
169.	Prof. Rajagopalan A.N.	Electrical Engineering
170.	Prof. Ravinder David Koilpillai	Electrical Engineering
171.	Prof. Sarathi R	Electrical Engineering
172.	Prof. Shanthi Pavan Y	Electrical Engineering
173.	Prof. Shanthi Swarup K	Electrical Engineering
174.	Prof. Shanti Bhattacharya	Electrical Engineering
175.	Prof. Sridharan K	Electrical Engineering
176.	Prof. Srikrishna Bhashyam	Electrical Engineering
177.	Prof. Srirama Srinivas	Electrical Engineering
178.	Prof. Mahesh Kumar	Electrical Engineering
179.	Prof. Srinivasan Umesh	Electrical Engineering
180.	Prof. Vinita Vasudevan	Electrical Engineering
181.	Prof. Aysha Iqbal Viswamohan	Humanities and Social Sciences
182.	Prof. Jyotirmaya Tripathy	Humanities and Social Sciences
183.	Prof. Muraleedharan V R	Humanities and Social Sciences
184.	Prof. Rajesh Kumar	Humanities and Social Sciences
185.	Prof. Sreekumar N	Humanities and Social Sciences

S. No.	Name	Department
186.	Prof. Srilata K	Humanities and Social Sciences
187.	Prof. Swarnalatha R	Humanities and Social Sciences
188.	Prof. Senkamalam Periyasamy Dhanavel	Humanities and Social Sciences
189.	Prof. Sudhir Chella Rajan	Humanities and Social Sciences
190.	Prof. Suresh Babu M	Humanities and Social Sciences
191.	Prof. Malathy Duraisamy	Humanities and Social Sciences
192.	Prof. Thamban Nair M	Mathematics
193.	Prof. Chidella Srinivasa Rao	Mathematics
194.	Prof. Jayanthan A V	Mathematics
195.	Prof. Ponnusamy S	Mathematics
196.	Prof. Rama R	Mathematics
197.	Prof. Sanyasiraju Y V S S	Mathematics
198.	Prof. Shaiju A J	Mathematics
199.	Prof. Sivakumar K C	Mathematics
200.	Prof. Srinivasa Rao Manam	Mathematics
201.	Prof. Sundar S	Mathematics
202.	Prof. Vetrivel V	Mathematics
203.	Prof. Arindama Singh	Mathematics
204.	Prof. Arya Kumar Bedabrata Chand	Mathematics
205.	Prof. Radha R	Mathematics
206.	Prof. Satyajit Roy	Mathematics
207.	Prof. Balaji C	Mechanical Engineering
208.	Prof. Dhiman Chatterjee	Mechanical Engineering
209.	Prof. Krishna Kannan	Mechanical Engineering
210.	Prof. Mallikarjuna J M	Mechanical Engineering
211.	Prof. Mani A	Mechanical Engineering

S. No.	Name	Department
212.	Prof. Prakash Maiya M	Mechanical Engineering
213.	Prof. Prasad B V S S S	Mechanical Engineering
214.	Prof. Raghu Prakash V	Mechanical Engineering
215.	Prof. Raju Sethuraman	Mechanical Engineering
216.	Prof. Ramesh A	Mechanical Engineering
217.	Prof. Ramesh Babu N	Mechanical Engineering
218.	Prof. Samuel G L	Mechanical Engineering
219.	Prof. Sarit K Das	Mechanical Engineering
220.	Prof. Seshadri Sekhar A	Mechanical Engineering
221.	Prof. Shaligram Tiwari	Mechanical Engineering
222.	Prof. Srinivasa Reddy K	Mechanical Engineering
223.	Prof. Srinivasan K	Mechanical Engineering
224.	Prof. Sundararajan T	Mechanical Engineering
225.	Prof. Venkatarathnam G	Mechanical Engineering
226.	Prof. Gnanamoorthy R	Mechanical Engineering
227.	Prof. Arunn Narasimhan	Mechanical Engineering
228.	Prof. Babu V	Mechanical Engineering
229.	Prof. Chandramouli P	Mechanical Engineering
230.	Prof. Krishnan Balasubramaniam	Mechanical Engineering
231.	Prof. Prabhu Rajagopal	Mechanical Engineering
232.	Prof. Raghavan V	Mechanical Engineering
233.	Prof. Shamit Bakshi	Mechanical Engineering
234.	Prof. Shankar Krishnapillai	Mechanical Engineering

S. No.	Name	Department
235.	Prof. Sujatha C	Mechanical Engineering
236.	Prof. Sujatha Srinivasan	Mechanical Engineering
237.	Prof. Balasubramanian M	Metallurgical and Materials Engineering
238.	Prof. Bhattacharya S S	Metallurgical and Materials Engineering
239.	Prof. Gandham Phanikumar	Metallurgical and Materials Engineering
240.	Prof. Ganesh Sundara Raman S	Metallurgical and Materials Engineering
241.	Prof. Kamaraj M	Metallurgical and Materials Engineering
242.	Prof. Prathap Haridoss	Metallurgical and Materials Engineering
243.	Prof. Ranjit Bauri	Metallurgical and Materials Engineering
244.	Prof. Ravikumar N V	Metallurgical and Materials Engineering
245.	Prof. Sankaran Shanmugam	Metallurgical and Materials Engineering
246.	Prof. Subramanya Sarma V	Metallurgical and Materials Engineering
247.	Prof. Harikumar K C	Metallurgical and Materials Engineering
248.	Prof. Sampath Kumar T S	Metallurgical and Materials Engineering
249.	Prof. Sampath V	Metallurgical and Materials Engineering
250.	Prof. Somnath Bhattacharyya	Metallurgical and Materials Engineering
251.	Prof. Udaychandran Chakkingal	Metallurgical and Materials Engineering

S. No.	Name	Department
252.	Prof. L.S. Ganesh	Management Studies
253.	Prof. Arshinder Kaur	Management Studies
254.	Prof. Kamalanabhan T J	Management Studies
255.	Prof. Krishna Prasanna P	Management Studies
256.	Prof. Prakash Sai L	Management Studies
257.	Prof. Rahul Ratnakar Marathe	Management Studies
258.	Prof. Saji K Mathew	Management Studies
259.	Prof. Srinivasan G	Management Studies
260.	Prof. Sundarraj R P	Management Studies
261.	Prof. Thenmozhi M	Management Studies
262.	Prof. Thillai Rajan A	Management Studies
263.	Prof. Usha Mohan	Management Studies
264.	Prof. Arun Kumar G	Management Studies
265.	Prof. Madhumathi R	Management Studies
266.	Prof. Rajendran C	Management Studies
267.	Prof. Abdus Samad	Ocean Engineering
268.	Prof. Jitendra Shital Sangwai	Ocean Engineering
269.	Prof. Krishnan Kutty P	Ocean Engineering
270.	Prof. Murali K	Ocean Engineering
271.	Prof. Nallayarasu S	Ocean Engineering
272.	Prof. Nilanjan Saha	Ocean Engineering
273.	Prof. Panner Selvam	Ocean Engineering
274.	Prof. Rajiv Sharma	Ocean Engineering

S. No.	Name	Department
275.	Prof. Sannasiraj S A	Ocean Engineering
276.	Prof. Srinivasan Chandrasekaran	Ocean Engineering
277.	Prof. Suresh Kumar G	Ocean Engineering
278.	Prof. S Surendran	Ocean Engineering
279.	Prof. Ananthakrishnan P	Ocean Engineering
280.	Prof. Bhattacharyya S K	Ocean Engineering
281.	Prof. Shanmugam P	Ocean Engineering
282.	Prof. Ganesan A R	Physics
283.	Prof. Harish Kumar N	Physics
284.	Prof. James Frederick Libby	Physics
285.	Prof. Manoj Gopalakrishnan	Physics
286.	Prof. Markandeyulu G	Physics
287.	Prof. Murugavel P	Physics
288.	Prof. Nirmala R	Physics
289.	Prof. Prafulla Kumar Behera	Physics
290.	Prof. Prem B. Bisht	Physics
291.	Prof. Ramachandra Rao M S	Physics
292.	Prof. Santhosh P N	Physics

## Appendix 2. Board of Academic Courses

### Chairman

Prof. V. Jagadeesh Kumar, Dean, Academic Courses

### Ex-officio

Prof. K. Ramamurthy, Civil Engineering

Prof. A. K. Mishra, Dean, Academic Research

### Members

Dr Sivasambu Mahesh, Aerospace Engineering

Dr Sarith P. Sathian, Applied Mechanics

Dr Manoj N., Biotechnology

Dr Vignesh Muthuvijayan, Biotechnology

Dr Jithin John Varghese, Chemical Engineering

Dr Sundargopal Ghosh, Chemistry

Dr S.M. Shiva Nagendra, Civil Engineering

Dr Rupesh Nasre, Computer Science and Engineering

Dr G Saravana Kumar, Engineering Design

Dr S. Krishna, Electrical Engineering

Dr K. Kalpana, Humanities and Social Sciences

Dr Manam Srinivasa Rao, Mathematics

S. No.	Name	Department
293.	Prof. Sethupathi K	Physics
294.	Prof. Srinivas V	Physics
295.	Prof. Vijayan C	Physics
296.	Prof. Arul Lakshminarayan L	Physics
297.	Prof. Jatindra Kumar Rath	Physics
298.	Prof. Kasiviswanathan S	Physics
299.	Prof. Lakshmi Bala S	Physics
300.	Prof. Neelima M Gupte	Physics
301.	Prof. Prasanta Kumar Tripathy	Physics
302.	Prof. Rajesh Narayanan	Physics
303.	Prof. Satyanarayana M V	Physics
304.	Prof. Sriramkumar L	Physics
305.	Prof. Subramanian V	Physics
306.	Prof. Suresh Govindarajan	Physics

### Secretary

1.	Dr Jane Prasad, IP&TAFS	Registrar
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### Student Members

307.	Mr Rohit Jhunjhunwala	Research Affairs Secretary
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308.	Mr Aman Kumar	
------	---------------	--

Dr G Srinivasan, Management Studies

Dr Abhijit Sarkar, Mechanical Engineering

Dr Parasuram Swaminathan, Metallurgical and

Materials Engineering

Dr Nilanjan Saha, Ocean Engineering

Dr Dawood Kothawala, Physics

### Time Table Committee

Dr Srinivasan K, Chairman, Time Table Committee

### Member Ex-officio

Dr Saji K Mathew, Management Studies

Dr Nilesh J Vasa, Chief Advisor, MITr

### Student Member

Aman Kumar, Students General Secretary

### Invitee

Shri P Sarvaharna, DR (Research)

Smt. Jayasri Sridhar, AR (Courses)

**Appendix 3. Board of Academic Research**

1.	Prof. A. K. Mishra, Dean (Academic Research)	Chairman
2.	Prof. V. Jagadeesh Kumar, Dean (Academic Courses)	Member - Ex-officio
3.	Prof. Nilesh J Vasa, Dean (Students)	"
4.	Dr G. Rajesh, Aerospace Engineering	Member
5.	Dr Vagesh D Narasimhamurthy, Applied Mechanics	"
6.	Dr Nitish Mahapatra, Biotechnology	"
7.	Dr R. Ravi Krishna, Chemical Engineering	"
8.	Dr Subhadeep Banerjee, Civil Engineering	"
9.	Dr Sanjay Kumar, Chemistry	"
10.	Dr John E. Augustine, Computer Science and Engineering	"
11.	Dr Srikrishna Bhashyam, Electrical Engineering	"
12.	Dr C S Shankarram, Engineering Design	"
13.	Dr N. Sreekumar, Humanities and Social Science	"
14.	Dr Neelesh S Upadhye, Mathematics	"
15.	Dr Rupashree Baral, Management Studies	"
16.	Dr Sundararajan Natarajan, Mechanical Engineering	"
17.	Dr V Subramanya Sarma, Metallurgical and Materials Engineering	"
18.	Dr V. Sriram, Ocean Engineering	"
19.	Dr P. Murugavel, Physics	"
20.	Dr G. Ranga Rao, Chief Advisor, <i>MITr</i> , Chemistry	"
21.	Shri Rohit Jhunjhunwala, Research Affairs Secretary	Student Member
22.	Shri Aman Kumar, Students General Secretary	"
26	Ms Vijayalakshmi K, Deputy Registrar (Research)	Invitee
27	Smt. Jayashree Sridhar	AR (Courses)
28.	Dr Shiva Nagendra S M (IDRP Co-ordinator)	IDRP Invitee

**Appendix 4. Board of Students**

S. No	Name	Officials' Designations	Status
1.	Prof. M.S. Sivakumar	Dean (Students)	Chairperson
2.	Prof. A.K. Mishra	Dean (Academic Research)	Member
3.	Prof. V. Jagadeesh Kumar	Dean (Academic Courses)	Member
4.	Prof. Mahesh Panchagnula	Dean (International Alumni Affairs)	Member
5.	Dr Shaligram Tiwari	Chairman, Council of Wardens	Member
6.	Prof. Dr Benny Raphael	Advisor (Sports)	Member
7.	Prof. Nandita Das Gupta	Advisor (Cultural)	Member
8.	Dr S. Faruque Ali	Advisor (Co-curricular)	Member
9.	Dr C. S. Shankar Ram	Advisor (Placement)	Member
10.	Dr G. L. Samuel	Advisor (Weaker Section)	Member

11.	Prof. Nilesh J. Vasa	Advisor (MITr)	Member
12.	Dr V. Vijayalakshmi	Advisor (Saathi)	Member
13.	Dr N. V. Ravi Kumar	Advisor (Internship)	Member
14.	Dr P. Sudarsan	Advisor (SLC/SECC & CMGFS)	Member
15.	Prof. Preeti Agalyam	Advisor (EML, Colloquium & T5E)	Member
16.	Dr Ashwin Mahalingam	Advisor (E-Cell)	Member
17.	Prof. K. C. Sivakumar	Chief Coordinator (NSS)	Member
18.	Dr G. Suresh Kumar	Chief Coordinator (NCC)	Member
19.	Dr Anup Kumar Bhandari	Chief Election Officer	Member
20.	Dr Shaligram Tiwari	Chair. Mess Mon Committee	Member
21.	Dr Palaniappan Ramu	Co-Advisor (S-Reach)	Member
22.	Dr Bobby George	Faculty Head (CFI)	Member
23.	Dr Satyanarayanan Seshadri	Deputy Faculty Head (CFI)	Member
24.	Mr P. V. Karunakaran	Deputy Registrar (Administration) I/C	Member
25.	Mr P. Sarvaharana	Deputy Registrar (Academic)	Member
26.	Mr Y. E. L. Sudhakar Rao Pujari	Deputy Registrar (Students)	Member Secretary

#### Student Members

S. No	Officials' Designations	Name	Status
1.	Speaker, SLC	Vacant	Student Member
2.	Students General Secretary (SGS)	Aman Kumar, CE16B116	Student Member
3.	Secretary (Hostel Affairs) (HAS)	Darwin S, EP17B020	Student Member
4.	Secretary (Academic Affairs)	Vacant	Student Member
5.	Secretary (Research Affairs)	Rohit Jhunjunwala, MS19D002	Student Member
6.	Secretary (Co-Curricular Affairs)	Mukund Khandelwal, ME16B152	Student Member
7.	Secretary (Cultural Arts)	Katari Harshal Amith, Vishwanath, ME17B146	Student Member
8.	Secretary (Cultural Literary)	Bonthu Vishnusanketh, ME17B045	Student Member
9.	International & Alumni Relations Secretary	Vacant	Student Member
10.	Secretary (Sports)	Breasha, BE17B015	Student Member
11.	Students Head, CFI	Tejas Deolasee, CH16B103	Student Member
12.	MITr Student Head	Aishwarya, MS18S006	Student Member
13.	Chairperson (Sub-committee for General Affairs)	Vacant	Student Member
14.	Chairperson (Sub-committee for Cultural Affairs)	Vacant	Student Member
15.	Chairperson (Sub-committee for Hostel Affairs)	Vacant	Student Member



16.	Chairperson (Sub-committee for Sports Affairs)	Vacant	Student Member
17.	Chairperson (Sub-committee for International and Alumni Relations)	Vacant	Student Member
18.	Chairperson (Sub-committee for Academic Affairs)	Vacant	Student Member
19.	Chairperson (Sub-committee for Research Affairs)	Vacant	Student Member
20.	Chairperson (Sub-committee for Co-curricular Affairs)	Vacant	Student Member
21.	Chairperson (Sub-committee for Social Equity)	Vacant	Student Member
22.	Chairperson (Sub-committee for Health, Hygiene and Environment)	Vacant	Student Member
23.	Chief Commissioner, Student Ethics & Constitutional Committee	Vacant	Student Member
24.	T5E Executive Editor	Vacant	Student Member

### Appendix 5. Board of Industrial Consultancy and Sponsored Research

Dr Ravindra Gettu, Dean, IC&SR Chairman  
 Dr Kamakoti V, Associate Dean, IC&SR (Ex-officio) Member (Ex-officio)  
 Dr Mahesh Panchagnula, Dean, ACR (Ex-officio)  
 Dr Krishnan Balasubramanian, Ex-Dean, IC&SR (Ex-officio)  
 Dr A. K. Mishra, Dean, Academic Research (Ex-officio)  
 Dr Jane Prasad, Registrar (Ex-officio)  
 Dr Ashok Jhunjhunwala, Professor In-charge, IITMRP  
 Dr Ranga Rao G, Department of Chemistry  
 Members  
 Dr Rajagopal K, Department of Civil Engineering  
 Dr Devendra Jalihal, Department of Electrical Engineering  
 Dr Muraleedharan V R, Department of Humanities and Social Sciences  
 Dr A. Thillai Rajan, Department of Management Studies  
 Dr C. Sujatha, Department of Mechanical Engineering  
 Dr Ravikumar N V, Department of Metallurgical and Materials Engineering  
 Dr Murali K, Department of Ocean Engineering  
 Dr Anand T N C, Department of Mechanical Engineering  
 Dr Mohana Sankar Sivaprakasam, Department of Electrical Engineering

Dr Ramakrishna P A, Department of Aerospace Engineering  
 Dr S. Vengadesan, Department of Applied Mechanics  
 Dr Vinu R, Department of Chemical Engineering  
 Dr Raghunathan Rengasamy, Department of Chemical Engineering  
 Dr Nageswara Rao B, Department of Civil Engineering  
 Dr Prasad B V S S S, Department of Mechanical Engineering  
 Dr Shanthi Pavan, Department of Electrical Engineering  
 Dr Nallayarasu S., Department of Ocean Engineering  
 Dr Subramanya Sarma, Department of Metallurgical and Materials Engineering  
 Dr Krishna Sivalingam, Department of Computer Science Engineering  
 Dr S. Mahalingam, Department of Biotechnology  
 Dr R Jayaganthan, Department of Engineering Design  
 Dr Sivaram Ambikasaran, Department of Mathematics  
 Dr Sivarama Krishnan, Department of Physics  
 Dr Tuhin Subhra Santra, Department of Engineering Design  
 Dr V. Suresh, STEO, IC&SR (Ex-officio) – Secretary

## Appendix 6. Library Advisory Committee

### Chairman

Prof. K. Ramamurthy, Civil Engineering

### Members

Dr Santanu Ghosh, Aerospace Engineering  
 Dr Arul K Prakash, Applied Mechanics  
 Dr Hamsa Priya Mohana Sundaram, Biotechnology  
 Dr Sridharakumar Narasimhan, Chemical Engineering  
 Dr B Rajakumar, Chemistry  
 Dr Soumendra Nath Kuiry, Civil Engineering  
 Dr B. V. Raghavendra Rao, Computer Science and Engineering  
 Dr M Ramanathan, Engineering Design  
 Dr P. Viswanadha Reddy, Electrical Engineering  
 Dr Santhosh Abraham, Humanities and Social Sciences

Dr P Krishna Prasanna, Management Studies  
 Dr Sounaka Mishra, Mathematics  
 Dr Vishal Nandigana, Mechanical Engineering  
 Dr Ajay Kumar Shukla, Metallurgical and Materials Engineering  
 Dr Suresh Rajendran, Ocean Engineering  
 Dr Prabhat Ranjan Pujahari, Physics

### Student Members

Chinmay Agarwal, Secretary (Academic Affairs) (SAA)  
 Rohit Jhunjhunwala, Research Affairs Secretary

### Library and Member Secretary

Dr Mahendra N. Jadhav

## Appendix 7. The Finance Committee

<b>Dr Pawan Goenka, Chairman</b> Executive Director, Mahindra & Mahindra, Mahindra Towers, Mumbai	<b>Chairman</b>
<b>Prof. Bhaskar Ramamurthi</b> Director, Indian Institute of Technology Madras, Chennai - 600 036	<b>Member</b>
<b>Shri Rakesh Ranjan</b> Additional Secretary (TE) Department of Higher Education, Ministry of Human Resource Development, Government of India, Shastri Bhavan, New Delhi - 110 115	(Ex-officio)* <b>Member</b>
<b>Shri Anil Kumar</b> Director (Finance) Integrated Finance Division, Department of Higher Education, Ministry of Human Resource Development, Government of India, Shastri Bhavan, New Delhi - 110 115	(Ex-officio)* <b>Member</b>
<b>Shri K. Vivekanandan, I.A.S.</b> Director, Directorate of Technical Education, Government of Tamil Nadu, Chennai - 600 025	<b>Member</b>
<b>Prof. Koshy Varghese</b> Dean (Administration), IIT Madras	<b>Invitee</b>
<b>Prof. Ligy Philip</b> Dean (Planning), IIT Madras	<b>Invitee</b>
<b>Deputy Registrar (F&amp;A)/Deputy Registrar (Audit)</b> IIT Madras	<b>Invitees</b>
<b>Dr Jane Prasad, IP&amp;TAFS</b> Registrar, Indian Institute of Technology Madras, Chennai - 600 036	<b>Secretary</b>

**Appendix 8. Building and Works Committee**

<b>Prof. Bhaskar Ramamurthi</b> Director, IIT Madras	<b>Chairman</b>
<b>Shri Er. R. Manivannan, B.E.</b> Chief Engineer/Distribution, Chennai South Region, 144 - Annasalai, Chennai - 600 002	<b>Member</b>
<b>Shri W Chidambaram</b> Superintending Engineer and Project Director, IITM Project, CPWD, Chennai - 600 006	<b>Member</b>
<b>Prof. Ligy Philip</b> Dean (Planning), IIT Madras	<b>Member</b>
<b>Prof. R G Robinson</b> Chairman (Engineering Unit), IIT Madras	<b>Member</b>
<b>Dr Jane Prasad, IP&amp;TAFS</b> Registrar, IIT Madras	<b>Member - Secretary</b>
<b>Shri K Dharmaraj</b> Superintending Engineer, Engineering Unit, IIT Madras	<b>Member</b>