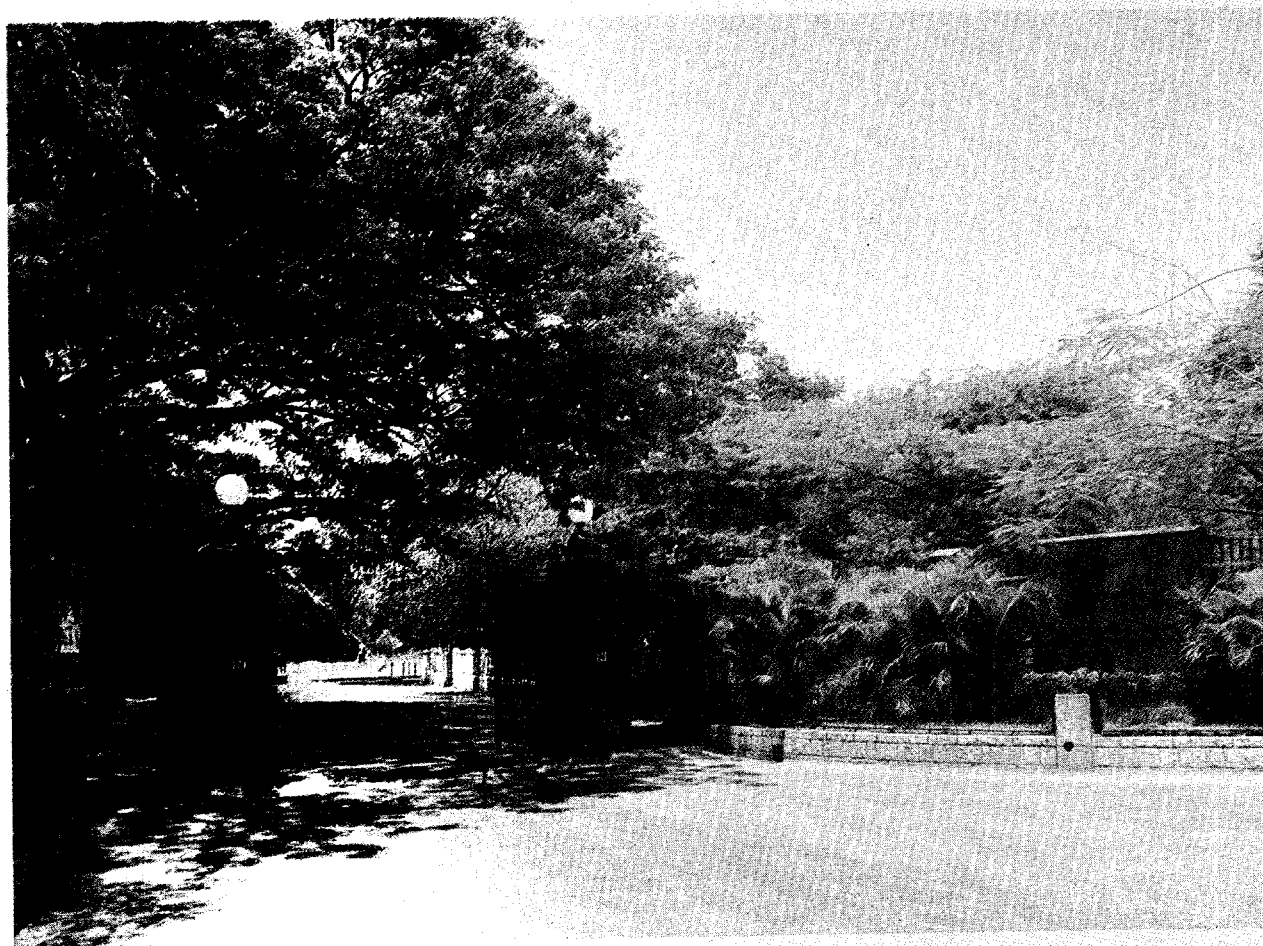


ANNUAL REPORT

1996 - 97



**INDIAN INSTITUTE OF TECHNOLOGY
MADRAS**

THIRTY EIGHTH ANNUAL REPORT

1996 - 97

C. NARAYANAN KUTTY,
Assistant Registrar (Acad.)
Indian Institute of Technology
Madras



**INDIAN INSTITUTE OF TECHNOLOGY
MADRAS**

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THE VISITOR

Dr. Shanker Dayal Sharma
President of India

THE BOARD OF GOVERNORS

Chairman

Prof. U.R. Rao

Director of the Institute

Prof. R. Natarajan

Members

Nominees of State Governments

Mr. Rajiv Sharma, IA.S.
Special Commissioner of Technical
Education Department
Andhra Pradesh

Dr. K. Balaveera Reddy
Director of Technical Education
Government of Karnataka

(Mrs.) V.K. Sulochana
Chief Engineer, DRIQ Board
Public Works Department
Thiruvananthapuram

Dr. P. Balakrishnan
Director of Technical Education i/c
Government of Tamil Nadu

Nominees of the IIT Council

Dr. A.P.J. Abdul Kalam
Scientific Adviser to the
Defence Minister
New Delhi

Mr. Mantosh Sondhi
Chairman
Ashok Leyland Limited, New Delhi

Dr. A.C. Muthiah
Vice-Chairman & President
SPIC Limited, Madras

Mr. Raghupati Singhania
Director
J.K. Organisation, New Delhi

Nominees of the Senate

Prof. V.M. Krishna Sastri
Dept. of Mechanical Engineering

Prof. U.N. Srivastava
Dept. of Mathematics

Secretary

Prof. G. Subramanian (till 30.5.1996)
Prof. R.C. Janakarajan (from 31.5.1996)

1. DIRECTOR'S REPORT

The IITs were set up by an Act of Parliament with a specific declaration that these are "Institutes of National Importance". They were conceived to act as leaders in Technology innovation, train the necessary man-power and promote generally the state-of-art of Technology in the country. IIT Madras has taken rapid strides in this direction from inception.

Today IIT Madras is a leading national and international institute for the advancement, dissemination and application of knowledge in Engineering, Technology and Physical Sciences.

The principal activities of this Institute are

- ❑ Post-graduate Education
- ❑ Undergraduate Education
- ❑ Basic, Applied and Sponsored Research
- ❑ Industrial Consultancy
- ❑ Continuing Education

This academic institution with an international reputation attracts the very best students in the country. The faculty are well qualified and are nationally and



internationally renowned in their subjects as researchers, teachers and scholars.

After my taking over as the Director of this Institute, following the direction of our Board, a Strategic Management Project was initiated in June 1996, with the Academy for Management Excellence as consultants. The project aims to develop a strategic plan for the Institute through the participation of all the faculty and staff. As part of this project three Workshops were conducted, two in June 1996 on 'Organisational Change Processes,' and one more in August 1996 on 'Strategic Issues in IIT - Industry Interface'.

As a follow-up of the above, four Working Groups were formed to take up studies internally in the following areas to develop action plans:-

- ▣ Scenario building and assessment of mix of IIT activities in 2005 (Education, Research and Service).
- ▣ Infrastructure, Information and Educational Technology.
- ▣ Human Resources Management.
- ▣ Quality of Support Services.

In addition, two studies were taken up by external consultants in the following areas:

- ▣ Resource Assessment, Mobilisation and Accountability Systems (M/s. A.F. Ferguson & Co.)
- ▣ Restructuring and Governance (M/s. Tata Consultancy Services)

The above areas were identified for study after taking into account the proposals made by various study groups during the Workshops and the work done by the following Task Forces:

1. Improving Interaction with the Outside Environment.
2. Information Technology.
3. Performance Appraisal and Professional Development for Faculty.
4. Professional and Career Development for Staff.
5. Teaching - Learning Processes.

6. Technology Upgradation of Institute infrastructure.
7. Total Quality Management (TQM).

A study on Marketing of IIT Products and Services has also been taken up from March 1997.

We have also embarked on an ambitious programme to secure ISO - 9000 certification for our support services. In this context, we have articulated our Quality Policy:

- ▣ Impart Quality Education in Technology and Science for Professional Excellence and Instil Commitment to Sustainable Development.
- ▣ Perform World Class Research to Advance the Frontiers of Knowledge.
- ▣ Provide Innovative Solutions through Research, Consultancy and Continuing Education for Satisfying Current and Future Industrial and R & D Needs.
- ▣ Extend Expertise towards improvement in the Quality of Technical Education.
- ▣ Achieve Excellence in the Support Services of the Institute through continuous improvement and teamwork.

This set of statements were evolved through the active participation of all faculty and staff.

Academic Programmes

The Institute has 574 core courses and 827 elective courses. In the odd and even semesters of 1996-97, 518 core courses and 358 elective courses were offered by the Departments. The Departments are continuously updating the curricula and the course contents. In the year 1996-97, 41 new courses were introduced and 181 courses were modified.

During this year, the introduction of an M.Tech programme in Composites Technology was approved by the Senate and the programme will be offered from the academic year 1997-98. The Fibre Reinforced Plastics Research Centre has been renamed as the Composites Technology Centre. The entire curriculum of the post-graduate programme of the Mechanical Engineering Department was revised this year.

During the year 1996-97 there were 2970 students on rolls of whom 896 were new students. This year the intake was more than that of last year. It is due to the admission of more number of students under the category of foreign nationals in the B.Tech. programme.

Student Intake: 1996-97

Ph.D.	74
M.S.	89
M.Tech.	299
M.Sc.	74
B.Tech.	360
Total	896

Student on Rolls: 1996-97

Ph.D.	543
M.S.	273
M.Tech.	562
M.Sc.	145
B.Tech.	1410
Preparatory Course	37
Total	2970

At the 33rd convocation held on 26th July 1996, 900 candidates were awarded various degrees. With this, the total number of candidates who have been awarded Degrees by this Institute has gone upto 19,354

Degrees Awarded: 1996-97

Ph.D.	114
M.S.	60
M.Tech.	318
M.Sc.	74
B.Tech.	334
Total	900

Assistantship to Students

During the year 1996-97, the following Scholarships and Fellowships were given to the students scholars:

- Merit cum Means scholarships for 34 B.Tech. students
- Free Messing - SC/ST scholarships for 21 B.Tech. students.
- Free Messing - SC/ST scholarships for 9 preparatory course students.
- 195 M.Tech. students were given Half-Time Teaching Assistantships (HTTAs). In addition, 115 HTTAs for the third semester students were renewed.
- 40 M.Sc. students were given Merit -cum -Means Scholarships: 14 of them were also given free studentships with tuition fee waiver.
- 60 fresh M.S. scholars were given Half Time Teaching/ Research Assistantships (HTRAs). In addition to this, 140 scholars were given renewal of HTRAs.
- 36 Ph.D. scholars were given HTRAs. In addition, 180 scholars were given renewal of HTRAs.

Thus, a total of 344 students/scholars were given scholarships/free studentships at this institute during the period under report.

New Endowment Prizes :

The following Endowment Prizes were established during this period:

1. Dr S Chandrasekhar Memorial Prize To the fourth year B.Tech. Mech. Eng. student with the best academic record in the first six semesters.
2. Prof N Venkatrayulu Memorial Prize To M.Tech. student in Thermal Sciences stream with the best academic record.

Faculty Development

Seminars/Symposia :

A large number of conferences, seminars, symposia and short term courses are regularly organised by the faculty members at this institute. During this year, the following 8 Symposia/ Conferences were conducted:

- National Convention and the 37th Annual Conference of the Association of Microbiologists of India - Recent trends in Biotechnology in Dec. 1996 (Chemistry Department.)
- National Seminar on 'Molecular Dynamics & Structures' in March 1996 (Chemistry Department.)

- ❑ Symposium on Finite Element Technology in Indian Industry in June 1996 (Civil Engineering Department.)
- ❑ International Conference on Photonics in Dec. 1996 (Electrical Engineering Department.)
- ❑ International Conference in Ocean Engineering in Dec. 1996 (Ocean Engineering Centre)
- ❑ National Seminar on 'Engineering Education for the 21st Century' in Jan. 1997 (organised in collaboration with the Indian National Academy of Engineering)
- ❑ An Open House was conducted on 16th and 17th January 1997.
- ❑ Conference on Recent Trends in Concrete & Steel Structures in April 1997 (Civil Engineering Department.)
- ❑ Exhibition cum Symposium on Advanced Technology for the 21st Century [Tech. 21] in Jan. 1997

Short-Term Courses :

During the period under report, 60 short term courses were organised by faculty members. 132 faculty members attended short term courses in other organisations in this period.

Special Lectures delivered :

During 1996-97, 153 faculty members gave special lectures in other Institutions.

Visits Abroad :

Sixty nine faculty members visited foreign countries in 1996-97 for various academic purposes.

Academic Distinction of Faculty Members :

In recognition of the excellence and expertise of our faculty members, several Academic Distinctions have been bestowed on them. A number of our faculty members serve on the Editorial Boards of International and National Journals; many of them have Chaired Technical Sessions at International and National Conferences during the year. Many faculty members and their students have won Best Paper Awards for their papers in Journals and Conferences during the year.

The following faculty members of our Institute have been elected Fellows of prestigious National Academies and as Members / Presidents of Professional Societies during this year:

- ❑ Prof. P.A. Aswathanarayana, Prof. T.K. Bose, Prof. A. Krishnan, Prof. S. Krishnan, Prof. S. Santhakumar, Prof. G. Subramanian and Prof. E.G. Tulapurkara as Fellows of the Aeronautical Society of India.
- ❑ Prof. C.R. Muthukrishnan, as Fellow of Computer Society of India.
- ❑ Prof. S. Narayanan, as Fellow of Indian National Academy of Engineering.

- Prof. M.R. Pranesh as Fellow of the Indian Geotechnical Society.
- Prof. S.V. Raghavan has been elected as a Governor in the International Council for Computer Communication.
- Prof. P.V. Subrahmanyam as Fellow of Forum D'Analyte (Madras)
- Prof. B. Viswanathan has been elected as President of the Catalysis Society of India.

The following faculty members have won International and National Awards and Prizes during the year:

- Prof. P.A. Aswathanarayana was awarded the Homi J. Bhabha Award for Research in Applied Sciences instituted by the University Grants Commission, for the year 1994.
- Dr. S.S. Bhattacharya received the 1996 Young Engineer Award of the Indian National Academy of Engineering.
- Dr. V. Damodara Das was awarded the Hari Om Ashram Prerit Award for the Best Research Work in India in Solid State Physics for the third consecutive five year period.
- Prof. V. Ganesan received the Sir Rajendra Nath Memorial Medal for 1995-96.
- Dr. S. Govindarajan, Dr. S. Neelamani and Dr. Paul Mario Koola were awarded the

Alexander von Humboldt Fellowship last year.

- Dr. A.K. Mishra received the Prof. R.C. Tripathy Memorial Young Chemist Award for 1997 by the Orissa Chemical Society for his contributions in Chemical Sciences.
- Prof. R. Natarajan, was awarded the 1996 Nayudamma Award of the Nayudamma Centre for Development Alternatives, Andhra Pradesh, for his outstanding contribution to the welfare of mankind through his researches in the field of Energy and Environment.
- Prof. T.V. Ramakrishna (Retd. Professor) received the Athavale Endowment Award for Research in Analytical Chemistry.
- Prof. D.V. Ramana (Retd. Professor) received the Gold Medal from the Indian Society for Mass Spectrometry for his contributions in the field of mass spectrometry.
- Prof. V. Radhakrishnan was awarded the Alexander von Humboldt Research Award last year.
- Prof. H. Raman, received the Institution of Engineers (India) Award of the "Union Ministry of Irrigation and Power - Department of Irrigation Medal" for the year 1995-96.

- ❑ Dr. P. Senthilkumaran received the 1997 INSA Medal for Young Scientists.
- ❑ Prof. M. Singaperumal was awarded the SONE Scholarship for his paper entitled "Performance Characteristics of a Hydraulic Motor in Hyperbolic Environment" by the Musashi Institute of Technology, Japan.
- ❑ Prof. R.S. Sirohi was awarded the 1995 Galileo Galilei Award of the International Commission for Optics.
- ❑ Prof. S. Srinivasa Murthy was awarded the Hari Om Ashram Prerit SS Bhatnagar Research Award 1992, based on the work done by him during 1987-92 in the area of Energy Conservation.
- ❑ Prof. B. Yegnanarayana has been selected for the Third Prof. S.V.C. Aiya Memorial Award of the IETE in recognition of his distinguished contributions for Motivating Research Work in Electronics and Telecommunication Engineering.

Books and Monographs :

Eighteen Books and Monographs were published by faculty members during the period under report.

Patents :

In the year 1996-97, 3 patents were obtained and one patent was filed.

Papers published :

In the year 1996-97, 503 papers were published by the faculty members in national and international journals; 567 papers were also presented by faculty members in national and international conferences.

Memoranda of Understanding Signed

During the year, five Memoranda of Understanding were signed with the following Universities abroad:

- National University of Singapore
- Shinshu University, Japan
- The Universite Libre de Bruxelles and C.O.D.U.L.B., Bruxelles
- The University of Vienna, Austria
- College of Engineering, Osaka Prefecture University, Sakai, Japan

The main thrust in these MoUs is the academic link/ interchange programme.

Continuing Education Programmes

Continuing education is one of the major activities of this Institute. In the year 1996-97, 9 Ph.D. and 14 M.Tech. students were admitted under the Quality Improvement Programme (QIP). With this, 16 Ph.D. and 19 M.Tech. students are currently on the rolls under QIP.

Under short-term training programmes, 5 summer/winter schools, and under Quality Improvement Programme 4 courses were conducted. These courses were mainly meant for teachers of Engineering colleges. A few participants from industry also took part in these programmes. Three proposals from faculty members for preparation of resource materials were approved during the year as part of Curriculum Development Programme.

In this period, 33 continuing education programmes were conducted and 585 participants attended these programmes. Many industries came forward to make use of the expertise of the faculty of IIT Madras through these programmes.

Our Education Technology Cell has so far completed 25 video programmes, and a few more are presently being completed.

Research and Development Activities

In the year 1996-97, 52 sponsored projects amounting to a total value of Rs.983 lakhs were sanctioned to our faculty members. In this period, 645 consultancy assignments, to the tune of Rs.355 lakhs, were also undertaken. This includes international consultancy assignments also.

Ten joint research projects were taken up through BMBF, (The German Ministry of Research and Technology). The earlier six GTZ projects for the development of facilities in Catalysis, Materials Science, Electronics, Production Engineering, Materials Testing and Ocean Engineering have been brought to a successful close. A few projects under Indo-US, Indo-EEC, Indo-French programmes etc. have also been undertaken.

2. ADMINISTRATION

2.1 General

I.I.T. Madras is an autonomous statutory organisation functioning within the "Institutes of Technology Act, 1961", as amended by "The Institute of Technology (Amendment Act, 1963". The six Institutes of Technology (others being at Bombay, Kanpur, Kharagpur, Delhi, and Guwahati) are administered centrally by the Council of IITs, an apex body established by the Government of India to coordinate the activities of these Institutes. The Minister for Human Resource Development of the Government of India is the Chair person of the Council. The list of the members of the Council is given in Appendix 1. Each Institute of Technology has a Board of Governors responsible for its overall administration and control. The composition of the Board of Governors of this Institute is given in page 1.

The Senate decides the academic policies of the Institute. It approves and controls curricula, courses, examinations and declaration of results. It appoints committees to look into 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 both facilities and standards. The Director of the Institute is the Chairman of the Senate. Members of the Senate are listed in Appendix II. Financial advice to the Institute is given by the Finance Committee, whose constitution is given in Appendix II. The Buildings and Works Committee advises the Institute on matters relating to buildings and works activity. The constitution of this committee is also given in Appendix II.

In addition, the Board of Academic Research, Board of Academic Courses, Board of Students and Board of Industrial Consultancy and Sponsored Research, are appointed by the Senate to help in the efficient administration of academic and research activities of the Institute. The composition of these Boards together with a list of other officers are also given in Appendix II.

2.2 Planning and Development Activities

The Director initiated a Strategic Management Project to bring about changes in the Institute's directions, structures, processes, interfaces and performance. As part of this project, the following seven areas were identified, five taken up by internal working groups and two by external consultants:

1. Scenario Building and Assessment of Mix of IIT Activities in 2005 (Education, Research and Service)
2. Infrastructure, IT and Educational Technology (Technological choice, Upgradation, Maintenance)
3. Human Resources Management
4. Quality of Support Services
5. Resource Assessment, Mobilisation and Accountability Systems (M/s.A.F. Ferguson & Company)
6. Restructuring and Governance (M/s. Tata Consultancy Services)

The draft of the first four working groups were discussed in a workshop held on March, 1997. 100 employees participated in this discussion along with 175 invitees.

Two workshops on organisation change processes were held in June 1996. In each workshop 30 employees participated.

A programme on Strategic issues in IIT-Industry Interface was held in August 1996. 20 Executives from Industries and 30 faculties from this Institute participated.

2.3 Staff Position

As on 31.3.97 341 Faculty, 29 Scientific Officers, 39 Officers, and 1446 supporting staff were in position. 103 new appointments for different positions were made. 85 Faculty/Officers and staff retired from their positions, 8 staff members took voluntary retirement and 15 expired/ resigned. During the period under report, 37 faculty and other staff were on long leave. The details of them are given separately.

Faculty/Staff who have Retired/Resigned during the Year:

Sl.No.	Name	Designation and Department	Date
I. Retirement:			
1	Vedhanayagam, S.K.	Supervisor (SG)Civil Eng.	30/04/1996
2	Innaci, M.	Tech. Officer Civil Eng.	
3	Subramanian, S.	Dafttry Gr.I(SG) Academic	
4	Sathyanarayana Rao,B.	Sr. Lab. Asst. Physics	
5	Annamalai, D.	Sr. Lab. Asst. Mech. Eng.	
6	Murugesan, R.	Lift Operator Eng. Unit	
7	Gopinathan,	C.Asst. (SG) Accounts	31/05/1996
8	Subramanian,	B..Asst. (SG)N.C.C.	
9	Paul,H.S.	Professor Mathematics	
10	Swamy, C.S.	Professor Chemistry	
11	Ethirajan, K.	Supervisor (SG)Physics	
12	Rajappa, S.	Supervisor (SG)Civil Eng.	
13	Sardar, M.	Workshop Supr.(SG)Mech. Eng.	
14	Sundareswaran, K.	Helper Gr.I(SG)Civil Eng.	
15	Ranganathan, E.	Sweeper Gr.I(SG)Eng. Unit	
16	Velayudham, M.	Jr.Mech.(Painter)Eng. Unit	
17	Chandran, K.	Jr.Mech.(Plumber)Eng. Unit	31/05/1996
18	Narayana Rao, Y.	Professor Electrical Eng.	
19	Viswanatha Reddy, K.	Professor Physics	
20	Murti, Y.V.G.S.	Professor Physics	
21	Manickam, S.	Chief D'Man Civil Eng.	
22	Subramanian, S.C.S.K.	(SG)Civil Eng.	
23	Jogarao, S.	Sr. P.T.I.Gymkhana	
24	Madhavan, K.	Supervisor (SG)C.W.S.	
25	Munuswamy, K.	Supervisor Mech. Eng.	
26	Duraiswamy, K.V.	Store AttnDt.Gr.I (SG)C.W.S.	
27	Dharmaraj, G.	Head Sec.Guard(SG) Sec. Sec.	30/06/1996
28	Arumugam, A.	Jr. Mech.Hum. & Soc. Sci.	
29	Madhavan, K.	Supr. (Sr.Book Binder)Central Lib.	

Sl.No.	Name	Designation and Department	Date
30	Narayanan, M.	Sr. Lab. Asst.Civil Eng.	}
31	Balaraman, P.	Jr. Mech.(Plumber)Eng. Unit	}
32	Srinivasan, L.	Sr. Mech.Physics	}
33	Kandaswamy, S.	Helper Gr.I (SG) Eng. Unit	}
34	Somu Achari, P.	Jr. Mech. (Carp.)Eng. Unit	}
35	Varadarajan Subrahmaniam	Asst. Professor Elec. Eng.	}
36	Naralah, K.	Sweeper Gr.I (SG)Eng. Unit	} 30/07/1996
37	Ramamurthy, K.	Maistry Gr.I (SG)Eng. Unit	}
38	Ramaswamy, K.	Asst. Registrar (Hostels)	}
39	Warrier, S.P.	Maistry Gr.I (SG)Eng. Unit	} 31/08/1996
40	Ramachandran, C.	Professor H.S.S.	}
41	Ramakrishna, T.V.	Professor Chemistry	}
42	Venkatesan, D.	S.T.A.C.P.S.	}
43	Vasudevant P.	Supdt. (Stores)A.C. Unit	}
44	Raman, B.	Superintendent C.C.E.	}
45	Gopi P.K.	Supervisor (SG) C.W.S.	} 30/09/1996
46	Purushotham, B.	Supervisor (SG)C.W.S.	}
47	Gangadharan, K.	Supervisor Mech. Eng.	}
48	Ekatha	Helper Gr.II Hospital	}
49	Raghavalu, P.	Sr. Lab. Asst.Mech. Eng.	}
50	Ponnan, M.	Head Sewerman Eng. Unit,	}
51	Krishnan, M.	Sup6rintendent Academic	} 31/10/1996
52	Anandan, C.	Jr. Mech.C.E.C.	}
53	Gopalakrishnan, K.V.	Professor Mech. Eng.	}
54	Iyer, K.J.L.	Professor Met. Eng.	}
55	Srinivasa Rao, P.	Professor Civil Eng.	} 30/11/1996
56	Abdullah Khan	Superintendent Accounts	}
57	Radhakrishnan, V.M.	Professor Met. Eng.	}
58	Varma, Y.B.G.	Professor Cheml. Eng.	}
59	Sethuraman, P.N.	Superintendent Physics	}
60	Mukdev Singh	Head Security Guard (SG) Dean (Admn) Off.	} 31/12/1996
61	Narayanaswamy, V.	Sr. Mali Eng. Unit	}
62	Palaniswamy, V.	Jr. Mech.(Carp.) Eng. Unit	}
63	Venu, R.	Helper Gr.I (SG) Eng. Unit	}
64	Govindarajulu, T.	D'Man Gr.I Eng. Unit	}
65	Anantharaman, G.	Superintendent Hospital	}
66	Mark, K.	Sweeper Gr.I (SG) Eng. Unit	} 31/01/1997
67	Kunjukunju, C.	Overseer Eng. Unit	}
68	Nicholas, A.	Sr. Mech. Mech. Eng.	}
69	Ramkrishnan, K.	Asst. Engineer Eng. Unit	}
70	Chandrasekaran, N.	Chief D'Man (SG) Eng. Eng.	}

Sl.No.	Name	Designation and Department	Date
71	Kandaswamy, K.	Foreman C.W.S.	}
72	Tapti Datta	S.P.A. Central Library	
73	Raghavan, C.	Supervisor (SG) C.W.S.	
74	Arumugam, M. (Masilamani)	Helper Gr.I (SG) Eng. Unit	
75	Thirumalaiah, N.	Head Sweeper (SG) Eng. Unit	
76	Shanmuga Sundaram, P.S.	Jr. Mech. Central Library	
77	Srinivsan, S.	Professor Physics	
78	Lakshmiiah, P.	Head Sweeper (SG) Eng. Unit	
79	Raju, M.	Sr. Mali Eng. Unit	}
80	Sambandan, P.	Jr. Mech. (Carp.) Eng. Unit	
81	Narayanan, D.	Sr. Helper Eng. Unit	
82	Manickam, K.	Chief Storekeeper Eng. Unit	
83	Pratapa Reddy, V.C.V.	Visiting Faculty Elec. Eng.	26/05/1996
84	Shan Somayaji	Visiting Professor Civil Eng.	20/08/1996
85	Jayaraman, R.	Visiting Professor Civil Eng.	24/09/1996
II. Voluntary Retirement			
86	Ranganathan, G.	Lift Operator Gr.I(SG) Eng. Unit	01/05/1996
87	Seshasayi, P.	Manager Computer Centre	15/05/1996
88	Ramanunni, M.	Supervisor C.W.S.	15/05/1996
89	Masilamani, Sp.	Helper Gr.I (SG) Eng. Unit	15/07/1996
90	Thangam Gopalan	Asst. (SG) Hospital	01/08/1996
91	Santhanakrishnan, T.R.	Pharmacist Gr.I(SG) Hospital	31/08/1996
92	Kesavalu, R.	Sr. Helper Eng. Unit	07/11/1996
93	Sankaran, K.	Asst. Librarian Central Library	06/01/1997
III. Expired			
94	Govindarajan, P.	Asst. (SG) Academic	19/04/1996
95	Raj, P.C.	Health Asst. Eng. Unit	13/05/1996
96	Santosh Aravind	Asst. Systems Officer Comp. Sci. & Eng.	12/03/1997
97	Antje Hoeller	DAAD Lecturer (German) H.S.S.	31/05/1996
IV. Resigned			
98	Thomas Zacharia	Visiting Faculty Met. Eng.	04/07/1996
99	Kalidoss, B.	Deputy Registrar IC & SR	13/06/1996
100	Ramana Rao, G.V.	Asst. Professor Comp. Sci. & Eng.	14/06/1996
101	Subir Kumar Saha	Visiting Faculty Mech. Eng.	01/07/1996
102	Ashwini Kumar Otta	Visiting Faculty O.E.C.	16/07/1996
103	Prabhakaran, B.	S.O. Gr.I Comp. Sci. & Eng.	10/10/1996
104	Kumar Pitchumani, N.	Lecturer (Contract) Civil Eng.	22/10/1996
105	Sujith, R.I.	Lecturer (Contract) Aerospace Eng.	29/10/1996
106	Sachin C. Patwardhan	Lecturer (Contract) Cheml. Eng.	31/10/1996
107	Subrata Chakrabarti	Visiting Faculty O.E.C.	05/02/1997
108	Rajeev, S.	Asst. Professor Civil Eng.	12/01/1996

Faculty/Officers who are on Long Leave:

Sl.No.	Name and Designation	Duration	Nature of leave
1	Dr.G.V.Subba Rao Professor, MSRC	05.12.92 - 04.02.97	EOL
2	Dr.M.Ravindran Prof. OEC	09.11.93 - 08.11.98	EOL
3	Dr.V.S.Raju Professor, OEC	09.01.95 - 08.01.97	EOL
4	Dr.A.Ganesan Chief Medical Officer	01.09.95 - 31.08.97	EOL
5	Sri V.K. Ranganathan	05.09.94 - 04.09.96	EOL
6	Dr.O.V.K. Chetty Prof. ME	12.12.94 - 11.12.96	EOL
7	Dr.O.Prabhakar Prof. MET	02.01.95 - 03.01.97	EOL
8	Dr.R.Balachandran Pillai STA Chemistry	07.06.95 - 06.06.97	EOL
9	Mr.B.Prabhakaran SSO I CSE	07.09.95 - 09.10.96	EOL
10	Dr.K.Swaminathan Asst.Prof. Met Eng.	09.10.95 - 08.10.96	EOL
11	Dr.P.Bhattacharya Prof. Maths	22.01.96 - 21.01.98	EOL
12	Dr.V.Jayaprakash Asst.Prof. ME	22.01.96 - 21-01-98	EOL
13	Mr.P.Sambandam Asst.Prof. OEC	25.03.96 - 24.03.98	EOL
14	Dr.C.Venkateseshalah Prof. EE	01.04.96 - 31.03.98	EOL
15	Dr.V.Sriramulu Prof. ME	01.04.96 - 31.03.98	EOL
16	Dr.P.Sasidhara Rao Asso. Prof.Elec.Eng.	01.04.96 - 31.03.98	EOL
17	Dr.K.N.Seetharamu Prof. ME	03.05.96 - 02.05.98	EOL
18	Mr.V.N.Shukla SDE Elec. Eng.	10.05.96 - 18.08.97	EOL
19	Ms Ranjana Shukla SDE Elec. Eng.	10.05.96 - 08.05.98	EOL
20	Mr. M. Kuppan Supdt. Admn.II	12/06/96 - 11.06.98	EOL
21	Mr.C.J.Gunasekar STA RSIC	14.06.96 - 13.06.97	EOL
22	Mr.R.Rajendiran STA RSIC	12.07.96 - 13.06.98	EOL
23	Dr.R.N.Anantharaman Prof. HSS	18.07.96 - 17.07.98	EOL
24	Mr.N.Devasahayam S.O.II RSIC	30.07.96 - 29.07.97	EOL
25	Sri M. Santhanam STA OEC	29.08.96 - 28.08.98	EOL
26	Dr.Nainan P.Kurian Prof. Civil Eng.	09.09.96 - 08.09.98	EOL
27	Dr.(Ms) Elizabeth N. Kurian Asso.Prof. HSS	24.09.96 - 23.09.98	EOL
28	Dr.(Ms)Hema Arunachala Murthy Asst.Prof. CSE	16.06.95 - 30.06.96	Sab.Leave + EL
29	Dr.V.R.Muralidharan Asst.Prof. HSS	28.08.95 - 27.08.96	Sab.Leave
30	Dr.C.Rajendran Asst.Prof. HSS	03.02.96 - 02.04.97	Sab.Leave + EL
31	Dr.S.Neelamani Asst.Prof. OEC	28.10.96 - 24.02.98	Sab.Leave + EL
32	Dr.J.Raamachandran Prof. App.Mechs.	02.01.97 - 01.01.98	Sab.Leave
33	Dr.R.S.Sirohi Prof. Physics	05.08.96 - 04.08.98	EL + HPL + EOL
34	Dr.(Ms) Vijayalaxmi Sirohi, Sys.Officer I,Comp. Centre	05.08.96 - 04.08.98	EL + HPL + EOL
35	Dr.M.Mylrajan S.O.II RSIC	10.03.97 - 10.03.99	EL + HPL + EOL
36	Dr.V.Radhakrishnan Prof. Mech.Eng.	05.09.96 - 04.09.97	HPL + EOL
37	Mr.R.Purushothaman Supdt. Admn.I	01.06.95 - 31.05.97	Deputation to NIOT

Faculty/Staff Appointed during the Year:

S.No.	Name	Designation	Department	Date of Joining
1.	K. Chandrakala	Sweeper	Eng. Unit	10.4.96
2.	R. Suriya Kumar (SC)	Mechanic	Met. Eng.	11.4.96
3.	M. Prabakaran (SC)	Mechanic	Met. Eng.	11.4.96
4.	V. Udayalanu (OBC)	Lab Attndt.	Physics	12.4.96
5.	S. Anand Kumar (SC)	Tech. Asst.	Comp. Centre	31.5.96
6.	Dr. R.C. Janakarajan	Registrar	--	31.5.96
7.	S.K. Sivakumar	Helper Gr.I	Stores	5.6.96
8.	Dr. G.V. Ramana Rao	Asst. Prof.	CSE	7.6.96
9.	N. Muniammal	Helper Gr.II	Maths	27.6.96
10.	Dr. Ashwini Kumar Otta	Visiting Faculty	OEC	4.7.96
11.	P.S. Lakshmi Narasimhulu	Helper Gr.I	R & AC	11.7.96
12.	Subbiah Arunachalam	Visiting Part-time Faculty	H.S.S.	15.7.96
13.	V. Lawrence Gray Kumar	PTI	Cymkhana	19.7.96
14.	K. Anthony Raj (SC)	Helper Gr.II	NCC	19.7.96
15.	D. Ramanan (SC)	PTI	Cymkhana	17.7.96
16.	Dr. K.V. Krishnamurthy	Visiting Part-time Prof.	Met. Eng.	1.8.96
17.	Dr. V. Padma	Part-time Faculty in English	H.S.S.	22.7.96
18.	Dr. Abhijit P. Deshpande	Visiting Faculty	Chem Eng.	19.8.96
19.	Dr. B.V.N. Rao	Deputy (Fin.&Accts.)	Reg. Accounts	22.8.96
20.	Reinhard Gunter Koeckritz	DAAD Lecturer in Germna	H.S.S.	17.9.96
21.	Dr. A. Selvam	Male JMO(adhoc)	Hospital	30.9.96
22.	Lt. Col. K. Rajendran	CSO (contract)	Security	3.10.96
23.	Dr. Kumar Pitchumani	Asst. Prof. (contract)	Civil Eng.	23.10.96
24.	Dr. R.I. Sujith	Asst. Prof.(contract)	Aerospace	30.10.96
25.	Dr. R. Sarathi	Lecturer (contract)	Elec. Eng.	31.10.96
26.	Dr. Sachin C. Patwardhan	Asst. Prof. (contract)	Chem. Eng.	1.11.96
27.	John De Bitto (OBC)	AEE (Civil)	Eng. Unit	4.11.96

S.No.	Name	Designation	Department	Date of Joining
28.	R.M. Parameswaran	AEE (Civil)	Eng. Unit	4.11.96
29.	S.K. Pati	AEE (Civil)	Eng. Unit	4.11.96
30.	S. Swaminathan	AEE (Elec.)	Eng. Unit	4.11.96
31.	Dr. S. Surendran	Asst. Prof. (on contract)	OEC	7.11.96
32.	Dr. Narasimha N. Murthy	Visiting Faculty	Chemistry	18.11.96
33.	Dr. K. Ananthanarayanan	Lecturer (contract)	Civil Eng.	21.11.96
34.	Dr. Subrata Chakrabarti	Visiting Faculty	OEC	2.12.96
35.	V. Seenivasan (OBC)	AEE (Hort)	Horticulture	12.12.96
36.	K. Dharmaraj (SC)	AEE (Civil)	Eng. Unit	12.12.96
37.	Dr. S. Radhakrishnan	Professor	App. Mech.	18.12.96
38.	Dr. R. Mahadevan	Professor	OEC	18.12.96
39.	Dr. S. Subba Rao	Professor	Chem.Eng.	18.12.96
40.	Dr. V.S. Ramachandra Rao	Professor	Chem. Eng.	18.12.96
41.	Dr. D.V.S. Murthy	Professor	Chem. Eng.	18.12.96
42.	Dr. N.R. Neelakantan	Professor	Chem. Eng.	18.12.96
43.	Dr. C.V. Gokularathnam	Professor	Met. Eng.	18.12.96
44.	Dr. S.D. Pathak	Professor	Met. Eng.	18.12.96
45.	Dr. S. Raghavan	Professor	Met. Eng.	18.12.96
46.	Dr. Y.G. Srinivasa	Professor	Mech. Eng.	18.12.96
47.	Dr. M. Singaperumal	Professor	Mech. Eng.	18.12.96
48.	Dr. N. Sivaprasad	Professor	Mech. Eng.	18.12.96
49.	Dr. S. Kumaraswamy	Professor	Mech. Eng.	18.12.96
50.	Dr. V. Balabaskaran	Professor	Mech. Eng.	18.12.96
51.	Dr. S. Santhakumar	Professor	Aerospace	18.12.96
52.	Dr. S.S. Gokhale	Professor	Aerospace	18.12.96
53.	Dr. A. Krishnan	Professor	Aerospace	18.12.96
54.	Dr. T.A. Gonsolves	Professor	CSE	18.12.96
55.	Dr. T.A. Prasada Rao	Professor	Physics	18.12.96
56.	Dr. J. Majhi	Professor	Physics	18.12.96
57.	Dr. V. Ramachandran	Professor	Physics	18.12.96
58.	Dr. K. Srinivasan	Professor	Physics	18.12.96

S.No.	Name	Designation	Department	Date of Joining
59.	Dr. B.S.V. Gopalam	Professor	Physics	18.12.96
60.	Dr. K. Lalitha	Professor	Chemistry	18.12.96
61.	Dr. T.S. Chandira	Professor	Chemistry	18.12.96
62.	Dr. N. Balasubramanian	Professor	Chemistry	18.12.96
63.	Dr. S. Var chesen	Professor	Chemistry	18.12.96
64.	Dr. L.S. Ganesh	Professor	H.S.S.	18.12.96
65.	Dr. K. Srinivasan	Assoc. Professor	Civil Eng.	18.12.96
66.	Dr. S.R. Gandhi	Assoc. Prof.	Civil Eng.	18.12.96
67.	Dr. A. Boominathan	Assoc. Prof.	Civil Eng.	18.12.96
68.	Dr. R. Ambalavanan	Assoc. Prof.	Civil Eng.	18.12.96
69.	Dr. A. Ramachandriah	Assoc. Prof.	Civil Eng.	18.12.96
70.	Dr. R. Natarajan	Assoc. Prof.	OEC	18.12.96
71.	Dr. S.K. Bhattacharya	Assoc. Prof.	OEC	18.12.96
72.	Dr. J.S. Mani	Assoc. Prof.	OEC	18.12.96
73.	Dr. Paramananda Singh	Assoc. Prof.	Met. Eng.	18.12.96
74.	Dr. S. Sankaranarayanan	Assoc. Prof.	Chem.Eng.	18.12.96
75.	Dr. R. Krishna Kumar	Assoc. Prof.	Mech. Eng.	18.12.96
76.	Dr. M. Govardhan	Assoc. Prof.	Mech. Eng.	18.12.96
77.	Dr. Raju Sethuraman	Assoc. Prof.	Mech. Eng.	18.12.96
78.	Dr. A. Mani	Assoc. Prof.	Mech. Eng.	18.12.96
79.	Dr. S. Krishnamurthy	Assoc. Prof.	Mech. Eng.	18.12.96
80.	Dr. G. Kuppuswamy	Assoc. Prof.	Mech. Eng.	18.12.96
81.	Dr. M. Ramakrishna	Assoc. Prof.	Aerospace	18.12.96
82.	Dr. P. Sriram	Assoc. Prof.	Aerospace	18.12.96
83.	Dr. S. Raman	Assoc. Prof.	CSE	18.12.96
84.	Dr. M. Thamban Nair	Assoc. Prof.	Maths	18.12.96
85.	Dr. R. Usha	Assoc. Prof.	Maths	18.12.96
86.	Dr. P. Veeramani	Assoc. Prof.	Maths	18.12.96
87.	Dr. G. Sreenivasamurthy	Assoc. Prof.	Physics	18.12.96
88.	Dr. T.S. Natarajan	Assoc. Prof.	Physics	18.12.96
89.	Dr. G. Sundararajan	Assoc. Prof.	Chemistry	18.12.96

S.No.	Name	Designation	Department	Date of Joining
90.	Dr. S. Sankararaman	Assoc. Prof.	Chemistry	18.12.96
91.	Dr. A.K. Mishra	Assoc. Prof.	Chemistry	18.12.96
92.	Dr. R.P. Viswanath	Assoc. Prof.	Chemistry	18.12.96
93.	Dr. V. Muraleedharan	Assoc. Prof.	HSS	18.12.96
94.	Dr. S. Jayachandran	Assoc. Prof.	HSS	18.12.96
95.	Dr. N.R. Neelakantan	Professor	Chem. Eng.	18.12.96
96.	Dr. R. Rukmani	Part-time	H.S.S.	6.1.97
97.	Dr. Alok Madan	Lecturer (contract)	Civil Eng.	9.1.97
98.	Dr.(Ms.) Sohini Paldey	Visiting Faculty	Met. Eng.	16.1.97
99.	Dr. Susy Varghese	Asst. Professor (contract)	Chem. Eng.	20.1.97
100.	C.R. Elangovan (SC)	Helper Gr.I	Mech. Eng.	11.3.97
101.	K. Arumugam (SC)	Jr. Engr. Gr.II	Eng. Unit	21.3.97
102.	K. Rizwan Ali (OBC)	Jr. Engr. Gr.II	Eng. Unit	27.3.97
103.	Chandramouli Padmanaban	Visiting Faculty	App. Mech.	29.3.97

Director

R. Natarajan

Deputy Director

C.R. Muthukrishnan

Deans

Academic Courses	M.S. Ananth
Academic Research	C.S. Krishnamoorthy(till 31.5.96, K.A. Padmanabhan(from 1.6.96)
Administration	N. Rajagopalan
Industrial Consultancy & Sponsored Research	K.V.S. Rama Rao
Students	P. Srinivasa Rao

Heads of Departments

Aerospace Engineering	E.G. Tulajithara
Applied Mechanics	B.S. Prabhu
Chemical Engineering	Ch.Durgaprasada Rao
Chemistry	M.R. Udupa
Civil Engineering	K. Elango
Comp. Sci. & Engineering	S.V. Raghavan
Electrical Engineering	G. Sridhara Rao
Humanities & Soc. Sci.	R. Rajagopalan (till 31.1.97) L.V.L.N. Sarma (from 1.2.97)
Mathematics	S.N. Majhi (till 10.11.96) P.R. Parthasarathy (from 11.11.96)
Mechanics Engineering	K.A. Bhaskaran
Metallurgical Engineering	D.R.G. Achar
Ocean Engineering Centre	M.R. Pranesh
Physics	G. Rangarajan

Heads of Centres

Computer Centre	V.V. Sastry
Fibre Reinforced Plastics Research Centre	N.G. Nair
Materials Science Research Centre	B. Viswanathan
Regional Sophisticated Research Centre	S. Subramanian

Central Administration

Director	R. Natarajan
Deputy Director	C.R. Muthukrishnan
Registrar	G. Subramanian (till 30.5.96) R.C. Janakarajan (from 31.5.96)
Deputy Registrars	
Academic	K. Panchalan
Administration	T. Suryakumar
Finance & Accounts	R. Kannan (till 21.8.96) B.V.N. Rao (from 22.8.96)
Stores & Purchase	A. Thirunavukkarasu
Training & Placement	A.K. Pattabiraman
Secretary (SG) to Director	V.V. Natarajan
Secretary to Director	G. Natarajan
Assistant Registrars	
Admn. I i/c.	C. Narayanan Kutty
Admn. II	K. Gopalan
Admn. III	V. Ganesan
Audit i/c.	E. Henry
Eng. Unit	R. Esakkimuthu
Finance & Accounts	P. Paramanandam
Fin. & Accts. IC&SR i/c.	K. Chidambaram
Hostels	P. Ramachandran
I.C. & S.R.	K. Ramaswamy (till 31.8.96) K. Sekar
Stores & Purchase	M. Rajasekaran
Chief Security Officer	M. Manickam
Security Officer	G. Selvamani (Incharge till 2.10.96) K. Rajendran (from 3.10.96) G. Selvamani
Engineering Unit	
Chairman, Estate & Works Committee	C. Ganapathy (till 19.6.96) P. Sankaran (from 20.6.96)
Institute Engineer	N. Malayalam
Executive Engineer	C. Ganesan
Assistant Executive Engineers	S.K. Pati (from 4.11.96) S. Swaminathan (from 4.11.96) R.M. Parameswaran (from 4.11.96) F. John De Britto (from 4.11.96) V. Seenivasan (from 12.12.96) K. Dharmaraj (from 12.12.96)

List of Other Officers

Central Library

Librarian

Deputy Librarian

Assistant Librarian

Senior Professional Assistant

Harish Chandra

R. Vengan

M. Koteswara Rao

K. Sankaran (till 5.1.97)

M. Murugan

C.C. Tean

C.R. Sekar

P.N. Swamy

D. Sobha Rao

R.K. Sankaran

P. Natarajan

Tapti Datta till 28.2.97

K. Sethu

Lalitha Rajenaran

K. Kamaraj

N. Gnanasekaran

K. Bhasker Rao

T. Ramakrishnan

Central Electronics Centre

Sr. Instrumentation Engineer

M. Kumaravel

Industrial Consultancy & Sponsored Research

Dean

Chief Techno-Economic Officer

Senior Techno-Economic Officer

K.V.S. Rama Rao

D. Balakrishnan

Y.G. Narasimha

R. Sunaram

Central Workshop

Senior Workshop Superintendent

Asst. Workshop Superintednent

Technical Officers (SG)

S. Jambunathar

N.L.N.N. Kumar

G.S. Ramachandran

A.V. Sunaram

Centre for Continuing Education

Chairman

V. Kalyanaraman (till 3.7.96)

V. Ganesan (from 4.7.96)

Central Glass Blowing Section

Head

C.S. Venkatachalam (till 31.10.96)

M. Chidambaram (from 1.11.96)

Central Photographic Section

Convenor

D.K. Sharma

Central Gas Supplies Unit

Head

K.K. Balasubramanian

Airconditioning Unit

Head

Technical Officer

Sports Activities

Adviser

R. Raman

S. Krishnaswamy

S.S. Gokhale (till 31.12.96)

B.S. Thandaveswara (from 1.1.97)

Cultural Activities

Adviser

V.G. Idi Chandy

National Cadet CORPS

Officer Commanding 4(TN)AIR SQN (TECH)

N.C.C.

Wg. Cdr. R.S. Kumar

Training and Placement

Adviser

A. Venkatesh (till 11.7.96)

A.R. Balakrishnan (from 12.7.96)

Foreign & Weaker Section Students

Adviser

R.M.S. Gowda

Vigilance

Chief Vigilance Officer

P. Sankaran (till 25.6.96)

K. Krishnaiah (from 26.6.96)

Guidance & Counselling

Head

N. Sivaprasad

Journal of Mathematical and Physical Sciences

Editor-in-Chief

G. Subramanian

N.S.S.

Coordinator

K.V. Gopalakrishnan (till 8.7.96)

T.T. Narendran (from 9.7.96)

3. ACADEMIC PROGRAMMES AND AWARD OF DEGREES

The Institute offered the Ph.D. programme in 13 departments, the M.S. programme in 10 departments, the M.Tech programme in 35 streams/ specialisations, the M.Sc. programme in 3 disciplines and the B.Tech programme in 8 disciplines during the year under report.

3.1 Admissions 1996-97

Candidates for the B.Tech. and the M.Tech. programmes were selected through JEE and GATE respectively. Quite a few candidates were also selected under M.Tech. Sponsored and User Oriented Programmes through interview and/or written test. Selection for the Ph.D. and the M.S. programmes was done through interview/test. For M.Sc., programmes selection was done through a written test.

The number of students and scholars admitted to various programmes during 1996-97 are given in Table 1.

TABLE - 1

S.No.	Department	B.Tech.	M.Tech.	M.Sc.	M.S.	Ph.D.	Total
1.	Aerospace Eng.	27	14	-	3	-	44
2.	Applied Mechanics	-	14	-	10	5	29
3.	Chemical Eng.	51	21	-	7	8	87
4.	Chemistry	-	-	23	-	22	45
5.	Civil Eng.	40	42	-	11	5	98
6.	Computer Sci. Eng.	30	38	-	13	2	83
7.	Electrical Eng.	76	33	-	15	3	127
8.	Hum. & Soc.Sciences	-	19	-	5	3	27
9.	Mathematics	-	-	30	-	5	35
10.	Mechanical Eng.	84	88	-	21	13	206
11.	Metallurgical Eng.	31	11	-	-	1	43
12.	Ocean Eng. Centre	21	11	-	9	-	41
13.	Physics	-	8	21	-	5	34
	Total	360	299	74	94	72	899

The total 899 includes the following:

Foreign Nationals	23	QIP Scholars (Ph.D. & M.Tech.)	23
Scheduled Castes	64	Sponsored Candidates (M.Tech. & M.S.)	31
Scheduled Tribes	27	Project Staff (M.S. & Ph.D.)	35
Women	90	External Registration (M.S. & Ph D)	9 (in residence)

In addition to the above 39 SC and ST students joined for Preparatory Course.

3.2 Students/Scholars Enrolment

The total number of students on roll in the various programmes of the Institute in the academic year 1996-97 are given in Table-2.

TABLE - 2

S.No.	Department	B.Tech.	M.Tech.	M.Sc.	M.S.	Ph.D.	Total
1.	Aerospace Eng.	92	28	-	13	20	153
2.	Applied Mechanics	-	24	-	26	36	86
3.	Chemical Eng.	202	37	-	17	46	302
4.	Chemistry	-	-	52	-	109	161
5.	Civil Eng.	169	80	-	27	45	321
6.	Computer Sci. Eng.	121	83	-	53	21	278
7.	Electrical Eng.	292	61	-	56	23	432
8.	Hum.& Soc.Sciences	-	42	-	9	25	76
9.	Mathematics	-	-	52	-	21	73
10.	Mechanical Eng.	338	149	-	53	92	632
11.	Metallurgical Eng.	117	23	-	9	32	181
12.	Ocean Eng. Centre	79	19	-	10	26	134
13.	Physics	-	16	41	-	47	104
	Total	1410	562	145	273	543	2933

The total 2933 includes the following:

Foreign Nationals	56	Project Staff (M.S. & Ph.D.)	107
Scheduled Castes	216	Defence (M.Tech.)	52
Scheduled Tribes	58	CSIR (Ph.D.)	32
Women	270	Handicapped	2
QIP Scholars (Ph.D. & M.Tech.)	87	Institute staff (M.S. & Ph.D.)	11
Sponsored Candidates (M.Tech. & M.S.)	63	External Registration (M.S. & Ph.D.)	8 (in residence)

3.3 Convocation

The 33rd Convocation was held on 26.7.1996. Dr. R.A. Mashelkar, Director General, CSIR and Secretary, Dept. of Scientific & Industrial Research, Govt. of India, delivered the Convocation Address. 900 candidates were awarded various degrees. 657 candidates received degrees in person. The break-up is given department-wise in Table-3.

Table - 3

Sl. No.	Department	No. of listed / approved courses			No. of courses offered in July-Nov 1996			No. of courses offered in Jan-May 1997		
		Core	Elect	Total	Core	Elect	Total	Core	Elect	Total
1	Aerospace	38	49	87	20	8	28	12	14	26
2	App.Mech	51	57	108	20	11	31	11	13	24
3	Chemical	30	61	91	15	8	23	8	20	28
4	Chemistry	32	27	59	18	2	20	8	13	21
5	Civil Engg	85	110	195	37	19	56	40	21	61
6	Comp.Science	37	57	94	18	10	28	16	11	27
7	Electrical	54	95	149	38	13	51	14	25	39
8	Humanities	13	72	85	8	15	23	7	17	24
9	Mathematics	20	66	86	11	12	23	9	14	23
10	Mechanical	101	88	189	57	18	75	43	20	63
11	Metallurgy	36	60	96	17	19	36	22	13	35
12	Ocean Engg	35	27	62	22	4	26	14	11	25
13	Physics	42	55	97	22	8	30	11	16	27
14	COMPTECH	-	3	3	-	1	1	-	2	2
Total		574	827	1401	303	148	451	215	210	425

3.4 Convocation

The 33rd Convocation was held on 26.7.1996. Dr. R.A. Mashelkar, Director General, CSIR and Secretary, Dept. of Scientific & Industrial Research, Govt. of India, delivered the Convocation Address. 900 candidates were awarded various degrees. 657 candidates received degrees in person. The break-up is given department-wise in Table-4.

TABLE - 4

S.No.	Department	B.Tech.	M.Tech.	M.Sc.	M.S.	Ph.D.	Total
1.	Aerospace Eng.	21	8	-	4	7	40
2.	Applied Mechanics	-	12	-	10	9	31
3.	Chemical Eng.	49	23	-	2	14	88
4.	Chemistry	-	-	23	-	22	45
5.	Civil Eng.	39	42	-	9	11	101
6.	Computer Sci. Eng.	26	42	-	7	3	78
7.	Electrical Eng.	72	48	-	11	8	139
8.	Hum.Soc.Sciences	-	23	-	5	5	33
9.	Mathematics	-	-	26	-	6	32
10.	Mechanical Eng.	80	83	-	11	11	185
11.	Metallurgical Eng.	28	11	-	-	5	44
12.	Ocean Eng.Centre	19	11	-	1	5	36
13.	Physics	-	15	25	-	8	48
	Total	334	318	74	60	114	900

With this Convocation the number of degrees awarded so far by the Institute is 19,374, the details of which are as follows:

Ph.D : 1847 M.Tech. : 6369 B.Tech. : 8419
M.S. : 1081 M.Sc. : 393 DIT : 245 B.Sc.(TA) : 20

3.5 Award of Prizes at the 33rd Convocation

The following are the details of Prizes awarded to the students at the 33rd Convocation for their best academic records:

President of India Prize	B.Tech.	Madanlal, M.S.	Computer Science and Engineering
Governor's Prize	B.Tech.	Amit Nag	Civil Engineering

Other Prizes

S.No.	Donor	Department	Name of Student
Doctor of Philosophy			
1.	Prof.C.N.Pillai Prize	Chemistry	N. Palani
2.	Prof Langmuir Prize	Chemistry	L. Gomathi

S.No.	Donor	Department	Name of Student
3.	Prof.A.L. Laskar Prize	Physics	R. Gopalan James Raju, K.K.
4.	Prof. Werner Prize	Chemistry	V. Badri
5.	Sudharsan Bhat Memorial Prize	Met. Eng.	J. Swaminathan
Master of Technology - M.Tech.			
1.	Air India Prize	Aerospace	P. Murugesan
2.	Institute Merit Prize	Ind. Tribology	Rane Sushil Datta Tanooja, S.
3.	Indira Sivasailam Merit Prize	Maint.Eng.and Management	Somasundaram, L.
4.	Prof BVA Rao Endowment Prize	Maint.Eng.and Management	Somasundaram, L.
5.	Dr.K.Subba Raju Memorial Prize	Chemical Engineering	G. Lakshmi
6.	Mico-Bosch Prize	Mech. Engineering	Sanjeev Chawla
7.	Valli Anantharamkrishnan Merit Prize	Civil Engineering	Piduri Raveendra
8.	K Devarajan Memorial Prize	Civil Eng. (Transportation Eng.)	Piduri Raveendra
9.	CMC Prize	Computer Sci. & Eng.	V. Srinivas
10.	Prof.H N Mahabala Endowment Prize	Computer Sci. & Eng.	B. Sivaramakrishnan
11.	Siemens Prize	Electrical Eng.	Surit Banerjee
12.	K.V.Arunkumar Memorial Prize	Industrial Management	C. Venkatramanamoorthy
13.	Coka Parthasarathy Memorial Prize	Industrial Management	C. Venkatramanamoorthy
14.	Prof B Sengupto Prize	Mechanical Eng.	Maragathavelan, P.C. Shrish Madhukar Golvalkar
15.	Dr S Vaidyanathan Memorial Prize	Mechanical Eng.(Computer Integrated Mfg./Manuf.Eng.)	V. Ganapathy Subramaniam
16.	Giri Brothers Prize	Mechanical Eng. (Project in Metrology)	V. Ganapathy Subramaniam
17.	S.Anantharamkrishnan Merit Prize	Mechanical Engineering	V. Rajendran
18.	Prof.Ramamohana Rao Memorial Prize	Mechanical Eng. (Machine Design Steam)	Shrish Madhukar Govalkar
19.	Sudarshan Bhat Memorial Prize	Metallurgical Engineering	Gunturi S.K. Satish
20.	American Bureau of Shipping Prize	Ocean Engineering	Indu, U. P.
21.	Institute Merit Prize	Solid State Tech.	Y. Arunachalam

S.No.	Donor	Department	Name of Student
22.	Institute Merit Prize	Transducer Physics and Instrumentation	Davinder Pal Ghai
23.	Prof Achim Bopp Endowment Prize	Elect. Engg. (Best Hardware Project)	Iyer Rajesh Balasubramaniam Kurundkar Rajeev Subhash Naveen B S

Master of Science - M.Sc.

1.	Dr S R Ramadas 60th Birthday Commemoration Award	Chemistry	K. Sripada Raj
2.	Ratna Rao Memorial Prize	Chemistry	K. Sripada Raj
3.	Mrs.Mira Paul Memorial Prize	Mathematics	Janaswamy Sreedhar
4.	Prof.Chilukury Rama-Sastry Memorial Prize	Physics	Sanjay Krishna

Bachelor of Technology - B.Tech.

1.	Dr.Shanker Dayal Sharma President of India Prize	Electronics & Communication Eng.	Shamibrata Chatterji
2.	HAL Prize	Aerospace Eng.	Girish Shrikant Nandgaonkar
3.	B.Ravichandran Memorial Prize	Chemical Eng.	Chandrasekar, P.
4.	Reliance Heat Transfer (P) Ltd. Prize	Chemical Eng.	Chandrasekar, P.
5.	Prof C A Sastry Endowment Prize	Chemical Eng.	Bharat Venkatrama Sharma
6.	Larsen & Toubro ECC Endowment Medal	Civil Engineering	G. Bhanu Prakash
7.	Alumni Association Prize	Computer Sci. & Eng.	Madan Lal, M.S.
8.	B Ravichandran Memorial Prize	Computer Sci. & Eng.	Madan Lal. M.S.
9.	Phillips (India) Prize	Electronics & Communication Eng.	Neelesh B. Mehta
10.	Motorola Prize	Electrical and Electronics	Shamibrata Chatterjee
11.	Siemens Prize	Electrical and Electronics	R. Srivaths
12.	Prof.Achim Bopp Endowment Prize	Elect. Eng. (Best Hardware Project)	Aditya Gilra

S.No.	Donor	Department	Name of Student
13.	Dr.Ing.Dieter Kind Prize	Elect.Eng. (Best project in high voltage measurement Power Systems)	Basanta Kumar Mishra
14.	Sir Viswesvaraiiah Memorial Prize	Comp. Sci. and Eng.	Madan Lal, M.S.
15.	Banco Foundation Prize	Mechanical Eng.	P. Laxmi Prasad
16.	Prof. GVN Rayudu Memorial Prize	Mechanical Eng.	P. Laxmi Prasad
17.	Sivasailam Merit Prize	Mechanical Eng.	Santhosh, N.K..
18.	Dr.Dhandapani Prize	Metallurgical Engineering	C. Balaji
19.	American Bureau of Shipping Prize	Naval Architecture	S. Mahesh

3.6 Institute Day Prizes

On the basis of performance during the Academic Session 1995-96, the following students were awarded Institute Merit and other Prizes.

Institute Merit Prizes

I.(I) B..Tech. (I and II Semesters) 1995-96

1.	First Prize (Book value of Rs.500/-)	CS 95149	Babu Shivnath
2.	Second Prize (Book value of Rs.250/-)	EE 95158	Gaurav Khare

II.(II) B.Tech (III and IV Semesters 1995-96)

3.	Aerospace Engineering	AE 94018	Shivraj Tenginakal
4.	Chemical Engineering	CH 94056	Sripad K. Devalkar
5.	Civil Engineering	CE 94110	Vinay, M.Y.
6.	Comp. Sci. and Engineering	CS 94133	Sriram, R.
7.	Electrical Engineering	EE 94188	G.V. Rangaraj
8.	Mechanical Engineering	ME 94247	Niranjana Nanda Kishore
9.	Metallurgical Engineering	MT 94290	B. Arun Prakash
10.	Naval Architecture	NA 94327	Karali, V.
11.	Aerospace Engineering	AE 93010	Mimosha Elizabeth Cherian
12.	Chemical Engineering	CH 93327	Vibna Srinivasan
13.	Civil Engineering	CE 93092	Mathew Kurian
14.	Comp. Science & Engineering	CS 93118	Hariharan Shankar Rahul
15.	Mechanical Engineering	ME 93230	B. Mahadevan
16.	Metallurgical Engineering	MT 93278	R. Arvind G. Srikanth

17.	Naval Architecture	NA 93313	B. Diwakar
18.	Ramasarma V Kolluri Memorial Prize	EE 93195	M. Sriram
19.	Raghavendra Memorial Prize	ME 94247	Niranjana Nanda Kishore K
20.	Rajalakshmi Krishnamurthy English Prize	CS 95138	Sundeep Reddy, P
21.	Chilikuri Ramasastry Memorial Prize	PH 95577	Satheesha A L
22.	R. Padmanabhan Memorial Prize	CY 95501	Aneetha M
23.	Dr. S. Chandrasekharan Memorial Prize	ME 93230	B Mahadevan
24.	Prof. N Venkatarayulu Memorial Prize	ME 95797	Lakshmana Rao K

4.1. Aerospace Engineering Department

1. Introduction:

The Department of Aerospace Engineering was established in 1969 and has been offering Ph.D., M.S., M.Tech., and B.Tech. programmes. The major areas of teaching and research of the Department are Aerodynamics, Propulsion and Structures.

2. Academic Programmes:

2.1 New Courses Introduced

Sl.No.	Course No.	Title	Structure	Faculty
1.	AE 605	Object Oriented Programme	3 0 0 3	Dr.M.Ramakrishna
2.	AE 690	Mechanics of Damage Tolerance	3 0 0 3	Dr.P.Sriram

2.2 Students on Roll (as on 30th Sept.1996)

Programme	I Year	II Year	III Year	IV Year	V Year	Total
B.Tech.	27	22	21	22	-	92
M.Tech.	14	14	-	-	-	28
M.S.	3	4	6	-	-	13
Ph.D.	1	-	-	9	10	20
Total	45	40	27	31	10	153

2.3 Number of Scholarship/Fellowship holders (as on 30th Sept.'96)

Programme	Institute Scholarship	Others	Total
M.Tech	13	14	27
M.S.	10	-	10
Ph.D.	7	1	8
Total	30	15	45

2.4 Number of Degrees Awarded in the last convocation

Programme	Number
B.Tech	21
M.Tech	8
M.S.	4
Ph.D	7
Total	40

3.1 Faculty and their Development:

Name and Designation	Area of Specialisation
Professors	
T.K.Bose, Dr. Ing. (Stuttgart)	Computational Fluid Dynamics, Plasma Physics, Gas dynamics, Heat Transfer and Propulsion
S.S.Gokhale, Ph.D. (Illinois)	Propulsion, computational Fluid Dynamics, Simulation & Optimization Multiphase flows
A.Krishnan, Ph.D. (IIT Madras)	Aircraft Structural Analysis and Design, Finite Element Method and Composites
S.Krishnan, Ph.D. (IIT Madras)	Aerospace Propulsion, Solid Propellant Combustions, Solid Rocket Technology
S.Santhakumar, Ph.D. (IIT Madras)	Aerodynamics, Flight Dynamics and Instrumentation
G.Subramanian, Ph.D. (IIT Madras)	Structural Analysis, Finite Element Method, Experimental Moire and Holography
E.G.Tulapurkara, Ph.D. (IIT Madras) [Head]	Flows, Flight Dynamics, Wind Tunnels and Aircraft Design
T.K.Varadan, Ph.D. (IIT Madras)	Structural Mechanics, Composite Non-linear Structural Mechanics
Associate Professors	
R.M.S.Gowda, Ph.D. (IIT Madras)	Structural Mechanics, Experimental Stress Analysis, Thermal Stress Analysis
Job Kurian, Ph.D. (IIT Madras)	Aerodynamics, Shock tube flows and measurements
M.Ramakrishna, Ph.D. (Arlington)	Aerodynamics, Numerical Methods, Computational Fluid Dynamics
P.Sriram, Ph.D. (Georgia)	Structural Mechanics, Composites Fatigue and fracture
Assistant professor	
K.Bhaskar, Ph.D. (IIT Madras)	Structural Mechanics, Elasticity, Composites

S.C.Rajan, M.Tech.(IIT Madras)

Aerodynamics, Numerical Methods, Computation Fluid Dynamics

R.I.Sujith, Ph.D.(Georgia Tech)

Gasdynamics, Acoustics, Combustion

3.2 Short-term Courses/Workshops/Semlnars/Symposla/Conferences Training attended by the Faculty in recognised Academic Institutions and Public Sector Units

Sl.No.	Name of the Faculty	Title	Period/Duration
1.	Prof.S.Krishnan	NCABE '96 (Co-Chairman)	28 - 30 December 1996

3.3 Special Lecture (s) Delivered by the faculty in other Institutions

S.No.	Name of Faculty	Topic of Lecture	Venue & Date
1.	Dr.R.I.Sujith	Optical Flow Diagnostics	Indian Institute of Science, Bangalore 20-02-1997

3.4 Visits abroad by faculty

Sl.No	Name of Faculty	Country visited	Date	Purpose o visit
1.	Dr.Job Kurian	Germany	01-09-96 to 30-09-96	Under DAAD Re-invitation Programme
2.	Prof.S.Santhakumar	Japan	23-11-96 to 29-11-96	To visit Saga University and have a discussion with Prof.T.Setoguchi.
3.	Prof.G.Subramanian	Singapore	04-12-96 to 08-12-96	To present a paper at the International Conference

3.5 Books/Monographs Published

Sl.No.	Faculty Name	Title	Publisher
1.	Dr.T.K.Bose	Numerical Fluid Dynamics	NAROSA, 1997

3.6. Patents filed:

Dr.S.Santhakumar

"Controller for fully protected buck converter"

3.10 Memberships/Fellowships In Professional Bodies

1. Prof.T.K.Bose Elected Fellow of Aeronautical Society of India
2. Prof.G.Subramanian Elected Fellow of Aeronautical Society of India
3. Prof.S.Krishnan, Elected Fellow of Aeronautical Society of India

- | | | |
|----|----------------------|---|
| 4. | Prof.E.G.Tulapurkara | Elected Fellow of Aeronautical Society of India |
| 5. | Prof.S.Santhakumar | Elected Fellow of Aeronautical Society of India |
| 6. | Prof.A.Krishnan | Elected Fellow of Aeronautical Society of India |

4.0 New facilities added and Major Equipment procured:

S.No.	Name of the Equipment	Quantity
1.	FIE Electronics Precision Ball Screwdriver tensile testing machine	1 No.
2.	Pentium Pro added to students computer room	2 Nos.
3.	Panasonic M3000 Video Camera	1 No.
4.	Panasonic M9500 Video Camera	1 No.
5.	Spur gear type chain pully	1 No.
6.	Mita DC 1555 Xerox Machine	1 No.

From H.A.L. Grant:

7.	German make Zett Ikolux Auto Focus selective automatic 35mm slide projector	1 No
8.	3M - 9080 Over Head Projector	1 No.

From Project Funds:

9.	UPS - 1 KVA	1 No.
10.	Pentium System	1 No.
11.	Silicon Graphic 1NDY Graphic workstation	2 Nos.
12.	3.0 KVA UPS	1 No.
13.	Impact 256 computer projection with OHP	1 No.
14.	14" SVGA Colour Monitor	1 No.
15.	HCL Pentium Computer	1 No.
16.	Automatic Test Instrument set-up for Rarefied Gas Dynamic Facility	1 No.
17.	14" SVGA Colour Monitor	1 No.

5. Research and Consultancy:

5.1 Sponsored Projects

Sl.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Co-Ordinator(s)
1.	Internal Flow with Chemical reaction	1994-97	ISRO	1.00	Dr.T.K.Bose

Sl.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Co-Ordinator(s)
2.	Heat Transfer In Impinging Arc	1995-98	DAE	1.20	Dr.T.K.Bose
3.	Flow Inside Passenger Car	1994-97	VW Germany	DM 100,000	Dr.T.K.Bose,
4.	Interference effects on flow around 3-D bluff bodies	1993-97	DST	8.00	Dr.E.G.Tulapurkara Dr.E.G.Tulapurkara Dr.B.H.L.Gowda(Applied Mech.)
5.	Evaluation of models of turbulence using DNS data base	1995-97	CSIR	2.43	Dr.E.G.Tulapurkara
6.	Free edge stresses in composite laminates subjected to transverse loads	1996-98	ARDB	2.714	Dr.T.K.Varadan Dr.K.Bhsakar
7.	Computer aided Instructions for commissioning education in Energy Science and Technology	1993-96	MHRD		Dr.S.S.Gokhale, Dr.R.Natarajan(ME), Dr.M.S.Wald (Hamburg)
8.	Development of Authoring System for Engineering Education	1994-96	MHRD	15.00	Dr.S.S.Gokhale, Dr.M.K.Ramanujam, Dr.S.K. Ramesh
9.	Duct Optimisation and Automatic pitch control for Waver Power Generator	1996-98	NIOT	7,00.50	Dr.S.Santhakumar
10.	Studies on Plume Flows and Plume Impingement	1995-98	ISRO	5.97	Dr.Job Kurian
11.	Modelling of impinging plasma jets	1995-98	DAE	10.46	Dr.M.Ramakrishna,Dr.T.K.Bose
12.	Analysis of Distributed Computing Flow over and airbreathing Vehicle using	1996-99	ISRO	10.65	Dr.M.Ramakrishna, Dr.D.Janki Ram (Computer Sci.)
13.	Combined Fluid-Structural Mechanics problem solving using Networked Processors	1996-98	IIT(M)	00.50	Dr.P.Sriram
14.	Aerodynamics Study of Helicopter Rotor and Development of Computer Code	1997-99	ARDB	3.187	Dr.M.Ramakrishna, Dr.M.Balakrishnan (App.Mech.)

Sl.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Co-Ordinator(s)
15.	Discontinuity stress in Laminated Composed Pressure Vessels	1997-99	DST	5.25	Dr.K.Bhaskar Dr.T.K.Varadan
16.	Further Erosive Burning Studies of Solid Propellants under Transonic and Supersonic Mach Numbers	1997	ARDB	3.39	Dr.S.Krishnan
17.	Development and Testing of piloted two-dimensional Supersonic Combustors	1996-98	ISRO	5.90	Dr.R.I.Sujith Dr.Job Kurian

5.2 Industrial Consultancy (only on going)

Sl.No	Title	Industry	Amount In lakhs	Co-ordinator
1.	Stress Analysis of Shrink fit between Crank Gear and Trunnion	L & T McNeil	00.25	Dr.G.Subramanian, Dr.P.Sriram
2.	Strain Measurements on the modified type curing press Phase I&II	L & T McNeil	00.65	Dr.S.Subramanian, Dr.A.Krishnan, Dr.Thomas (App. Mech.)
3.	Studies in Nozzle flow separation	LPSC	1.00	Dr.SS.Gokhale
4.	Analysis and model testing of ALH Helicopter with EFG.	HAL	00.05	Dr.S.Santhakumar, Mr.P.Sambandam, Dr.R.L.Roy Chowdhry (OEC)
5.	Selection of Aircraft	AFF & Co.	00.05	Dr.S.Santhakumar

5.3 RBIC (ongoing)

S.No.	Name of the Investigator/ Co-Investigator	Number	Values (In lakhs)
1.	Dr.E.G.Tulapurkara Dr.G.Subramanian Dr.A.Krishnan Dr.S.Santhakumar Mr.S.C. Rajan	RB/9	6.00
2.	Dr.P.Sriram Dr.C.Sujatha (App. Mech.)	RB/96-97/ASE/001/LTML/GSUB	1.00

S.No.	Name of the Investigator/ Co-Investigator	Number	Values (In lakhs)
3.	Dr.S.Santhakumar	RB/96-97/ASE/002/DRDL/SSAN	0.50
4.	Dr.Job Kurian,Dr.R.I.Sujith	RB/96-97/ASE/003/VSSC/JOBK	6.00

5.5 Research Publications

(a) Journals - International & National

- Balakrishnan, S.R., and Santhakumar, S., "A fuzzy logic approach in the control of twin spool aircraft gas turbine engine under development", Proc. of Instn. of Mech. Engrs., Vol.210, 1996, pp.273-281.
- Balamurugan, V., Ganapathi, M., and Varadan, T.K., "Nonlinear dynamic instability of laminated composite plates using finite element method, Computers & Structures", Vol.60, No.1, pp.125-130, 1996.
- Bhaskar.K., Varadan.T.K., Ali.J.S.M., "Thermoelastic Solutions for Orthotropic and Anisotropic Composite Plates", Composites Part B, 27 B, 1996, 415-420.
- Bhaskar,K., Jiji Mathew and Varadan, T.K., "Elasticity Solutions for Cylindrical Bending of Clamped Isotropic Plates under Thermo-mechanical Loads", Jl.of Aero. Soc. of India, 48(3) 1996, 229-235.
- Bhaskaran, K.A. Job Kurian, Suresh, V., Umashankar, P.B, Pillai, B.C. and Kumar, B.C. "Ignition studies on aluminised propellant", Defence Sciences Journal, Vol.45., No.5., Nov.1996, pp.411-416.
- Dhinakaran,R., and Bose,T.K., Flow and Heat transfer in a Two- dimensional Nozzle with Secondary Gas Injection, Jl. of Energy, Heat and Mass Transfer Gokhale,S.S., and Manoj Arora, "Experimental Studies in Axisymmetric and Two Dimensional Nozzles", Jl. of Aero. Soc. of India, Vol.48, No.3 (1996)
- Krishnan, S., and Swami, R.D., "effect of Catalyst Mixing Procedure on Subatmospheric Combustion Characteristics of Composite Propellants", Jl. of Propulsion and Power, AIAA, Vol.14, No.2, March-April 1997.
- Panneerselvam,S., Soundararajan,P., Santhakumar,S., "Aerodynamic characteristics of a Body Configuration with split Flaps" Jl. of Aero. Soc. of India., Vol.48, No.1, Feb.1996, pp.23-33.
- Rajamanohar,D. and Kurian,J., "Preliminary studies on duel mode combustion ramjet using petal nozzle", J. of Propulsion and Power, 12,2, 1996, pp.424-426.
- Ramana Rao, T.V., Ramesh Kumar, R. and Job Kurian., "Nearfield shock structure of dual co-axial jets", Shock Waves - The International Jl. Vo.6, No.6, Dec.1996, pp.361-366.
- Ramesh Kumar, R. and Kurian, J., "Estimation of mixing of isothermal high speed streams", J. of Propulsion and Power, 12,2, 1996, pp.429-431.
- Ramesh Kumar,R. and Kurian,J., "Co-axial jets from mixer nozzle", AIAA Journal., 34,9, 1996, pp.1822-27.

13. Santhakumar,S. Balamurugan,Sp., "Preliminary Experiments in a Adaptive Wall Wind Tunnel", JI. of Aero. Soc. of India.
14. Sarkar,S, and Bose,T.K., Numerical analysis of Slot-Film Cooling: Effectiveness and Flow-Field, Transactions of the ASME, Vol.118, Dec.1996, pp.864-867.
15. Sarkar,S, and T.K.Bose, Numerical Analysis of Slot-Film Cooling: A Parametric Study, J.Aero. Soc. of India, Vol.47, 1996, pp.80-90.
16. Shashidhar.S, and Rajan.S.C., "Dynamics of vortex by Unsteady Point Vortex Methods", Vol.48, No.2, pp.200-206, 1996.
17. Sivasubramanian,B, Kulkarni,A.M., Venkateswara Rao, G., and Krishnan,A., "Free Vibration of curved panels with cutouts", JI. of Sound and Vibrations, Vol.200(2), 1997, pp.227-234.
18. Srikrishnan, A.R., Kurian, J. and Sriramulu, V., "An experimental study on mixing enhancement by petal nozzle in supersonic flow", J. of Propulsion and Power, Vol.12, No.1, 1996, pp.165-169.
19. Srikrishnan, A.R., Kurian, J, and Sriramulu, V., "Enhancement of thermal mixing in coaxial supersonic jets", J. of Propulsion and Power, 12.4, 1996, pp.730-735.
20. Srikrishnan, A.R Kurian,J. and Sriramulu,V., "An Experimental study of thermal mixing and combustion in supersonic flows", Combustion and Flame, Vol.107, No.4, Dec.1996, pp.464-474.
21. Subramanian, G., and Mohan, P., "Fast Algorithm for the static shape control of flexible structures, Computers & Structures", 59(3), 1996, 485-488
22. Subramanian, G., Prasanth, A., and Raveendra, V.V.S., "An algorithm for two and three-dimensional automatic structures mesh generation, Computer & Structures, 61(3), 1996, 471-477.
23. Subramanian, G., and Raman, A., "Iso-spectral systems for tapered beams, J. Sound and Vib.", 198(3), 1996, 257-266.
24. Subramanian, G., and Subramanian, A., "Curvature based reflection moire method - extended to metallic and FRP plates", J.Ae.S.I., 48(3), 1996, pp.241-245.
25. Subramanian, G., and subramanian, A., "Curvature contours of flexed plates by a multiple illumination moire shearing interferometer, Strain", 32(2), 1996, 59-62.
26. Subramanian, G., and Subramanian, A., "A Single exposure reflection moire interferometric technique for complete curvature analysis of bent plates, Strain", 33(1), 1997, 3-7.
27. Sujith,R.I., Waldher, G.A., Jagoda, J.I., and Zinn,B.T., "On the Effect of Evaporation on Droplet DRag", JI. of Fluids Engineering, 1996, 118,pp.862-864,
28. Sujith,R.I., "Transfer Matrix of a Uniform Duct with an Axial Mean Temperature Gradient", JI. of the Acoustical Society of America, 100, pp.2540-2542.
29. Suresh,V., Job Kurian and Bhaskaran, K.A., "Ignition of aluminium particles in an oxidising stream", J. of Aero. Soc. of India., Vol48, No.3, Aug.1996, pp.254-260.
30. Tulapurkara, E.G, "Turbulence Models for the Computation of Flow Past Airplanes", Progress in Aerospace Sciences, Vol.33, pp.71-165,1997.

(b) Conferences - International & National

1. Bhaskar, K., Jiji Mathew and Varadan, T.K., "Elasticity solutions for cylindrical bending of clamped isotropic plates under thermo-mechanical loads", *J. of Aero. Soc. of India*, **48(3)**, 1996, 229-235.
2. Bhaskar, K., Varadan, T.K, and All, J.S.M., "Thermoelastic solutions for orthotropic and anisotropic composite plates", *Composites Part B*, 1996, 415-420.
3. Blazskaran, K.A., Job Kurian, Suresh, V., Umashankar, P.B., Pillai, B.C., and Kumar B.C., "Ignition studies on aluminised propellant", Presented at the International Seminar on High Energy Materials, Pune, Dec. 1996.
4. Bose, T.K., Effect of Heat Transfer on Performance of a Generi Compressor, Proc. 3rd National Conf. on Airbreathing Engines (NCABE), Madras, Dec. 1996, pp.276-283.
5. Gokhale, S.S., "Fuel Conservation in Aviation", 5th International Aviation Seminar, Khajuraho, India, Jan. 1996.(\$)
6. Gokhale, S.S., "Ten Years Perspective Plan for Department of Aerospace Engineering", AR & DB Silver Jubilee Celebrations Seminar, Bangalore, May, 1996.
7. Job Kurian, "Some aspects of mixing of high speed streams using radially lobed nozzles", Proceedings of the 3rd National Conference on Airbreathing Engines and Airbreathing Propulsion, IIT, Madras, Dec. 1996, pp.151-160.
8. Job Kurian, "Mixing performance of radially lobed supersonic nozzles", Accepted for presentation at the 13th Int. Symp Airbreathing Engines, Tennessee, USA., 1997.
9. Kanaka Durga., "Analysis of flow through a petal nozzle" AeSI conference on the occasion of the 47th AGM, Jan.6-8, 1996, IIT, Madras.(\$)
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12. Krishnan, A., Geetha George and Malathi, P., "Free Vibration of beams using finite difference methods", *Jl. of Aero. Soc. of India*, 47th AGM, Jan. 1996, IIT, Madras.(\$)
13. Krishnan, A., and Geetha George, "Free Vibration Studies on Beams using Galectiesn thick elemac Method", *Aero. Soc. of India*, 48th AGM, Jan-Feb. 1997, Thiruvananthapuram.
14. Krishnan, S., Philmon George, and Shrotri, P.G., "Solid Fuel Ramjet Combustion chamber Studies", AGM of Aero. Soc. of India, Jan.6-8, 1996, IIT, Madras.(\$)
15. Krishnan, S., and Rajesh Ramakrishna, "Testing of Nozzleless Solid Propellant Rocket Motors", AGM of Aero. Soc. of India, Jan.6-8, 1996, IIT, Madras.(\$)
16. Krishnan, S., and Swami, R.D., "Copper Chromite Catalyst Qualifi- cation as Composite Solid Propellant Burning Rate Enhancer", 47th AGM of Aero. Soc. of India, Jan.6-8, 1996, IIT, Madras.(\$)
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23. Manoj Kumar,B Sujith,R.I., "Exact solution for longitudinal vibration of non-uniform rods, 48th AGM of the Aeronautical Society of India, Jan.30 - Feb.1, 1997, Trivandrum.
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41. Tulapurkara,E.G., Srinivasan,R.A., and Bose,T.K., Mean Velocity Measurements Inside a Rectangular Enclosure with Partition, Fluid Mech. & fluid Power Conf., Bhopal, Dec. 1996, pp.371-378.

6. Distinguished Visitors to the Department
(Important dignitaries above the level of Professors only)

Sl.No.	Name of the Visitor and Designation	Date of visit	Purpose of visit (Lecture/Discussion)
1.	Mr.K.Ibrahim Chief Manager (Design) HAL, Bangalore	15-04-1996 - 16.04.96	To give Lectures on Design Trainer Airplane
2.	Sri.S.Ramakrishnan Head, Vehicle Integration VSSC, Trivandrum	19-04-1996	To give Industry Lecture on Space Vehicle Integration
3.	Miss Urmila Reddy Georgia Inst. of Tech, USA	24-06-1996	To give Seminar Talk on Velocity Field Measurements in 3- Dimensional Unsteady Flow
4.	Dr.A.K.Das Scientific Officer Laser and Plasma Technology Divn. BARC, Bombay	12-07-1996	To give Seminar Talk on Practice of Plasma Physics as a Cross- disciplinary Linkage

Sl.No.	Name of the Visitor and Designation	Date of visit	Purpose of visit (Lecture/Discussion)
5.	Dr.Sathyanarayanan Chakravarthy Georgia Inst. of Tech. Atlanta, Georgia, USA	10-09-1996	To give Seminar Talk on Metal Combustion in Solid Rocket Motors
6.	Mr.R.V.Ravikrishna Purdue University USA	01-10-1996	To give Seminar Talk on Laser Induced Fluore-science Measurements and Modelling of Nitric Oxide in Counter flow Diffusion Flames
7.	Mr.S.A.Hakeem Dy. General Mager (Design) HAL Bangalore	03-11-1996 to 05.11.96	To give Special Lectures on Structural Design of Airplane
8.	Prof.P.K.Sen Dept. of Applied Mech. IIT Delhi	20-12-1996	To give Seminar Talk on Boundary Layer
9.	Dr.Subramanian V.Sankar T.S.I. Minneapolis USA	14-2-1997	To give Seminar Talk on Recent Developments in Optical Flow Diagnostics
10.	Dr.Ram S.Azad Dept. of Mech. and Industrial Eng. Univ. of Manitoba Canada	25-2-1997-27-2- 1997	To give Seminar Talk on Turbulent Flows in Conical Diffusers and discussion with faculty and students
11.	Prof.K.A.V.Pandalai Former Director IIT Madras	26-2-1997	To give Seminar Talk on Symbolic Computational Languages and Structural Mechanics
12.	Mr.K.Ibrahim Chief Manager (Design) HAL Bangalore	31-03-1996	To give Industry Lecture on H.A.L.

7.Any other relevant details

7.1 Teaching:

During the semester Jan. - May 1996 the department offered 31 courses. During the subsequent semester (July-Nov.1996) 28 courses were offered. The department secured the highest course evaluation rating during the Jan-May 1996 secession among all the departments and the second highest in the July-Nov. 1996 secession.

7.2 Activities related to corporate life in campus/Professional Activities

Name of the Faculty	Professional Membership/Activities
Prof.E.G.Tulapurkara	Council Member - Aero. Society of India
Prof.S.S.Gokhale	Advisor - Sports
Prof.S.Santhakumar	President - Film Club Member - Library Advisory Committee

Prof.S.Krishnan	Warden - Krishna Hostel Chairman- Aero. Society of India (Chennai)
Prof.G.Subramanian	Chairman - Staff Canteen Committee Chairman - Journal of Mathematical and Physical Sciences
Dr.R.M.S.Gowda	Registrar - IIT, Madras (Upto June 1996) Warden - Alakananda Hostel Member - Board of Academic Courses Treasurer - Aero. Society of India (Chennai)
Prof.T.K.Varadan	Advisor - Foreign and Weaker Section Member, Board of Academic Research
Dr.Job Kurian	Member - IC & SR Board Advisor - Guest Houses
Dr.M.Ramakrishna	Member - Scenario Planning Group, Advisory Committee of Central Computing facility
Dr.R.I.Sujith	Secretary-Aero. Society of India (Chennai)

7.3 Other Activities:

The Department has 15 faculty members, 15 non-teaching technical and 10 non-teaching and non-technical staff. The non-teaching staff also participated in institute activities. e.g. Sri.P.Seetharaman Sri.G.Balakrishnan acted as Checking Inspector in IIT Buses and Sri.M.Srithar represented IIT(M) in Inter IIT Sports Meet at IIT, Kanpur during December 1996. The following staff obtain proficiency in Hindi: 1) Mr.M.Karuppalah, 2) Mr.P.Seetharaman, 3) Mrs.T.R.Yamuna and 4) Mr.M.Srithar.

□

4.2 Applied Mechanics Department

1. Introduction

The Department of Applied Mechanics was established in 1959, and it offers Ph.D., M.S. and M.Tech. programmes. The major areas of teaching and research of the Department are the following:

The research in the **Biomedical Engineering Division** is concentrated in the three main areas of Bioinstrumentation, Biomechanics and Biomedical Image and Signal processing. The faculty of this Division are carrying out research in collaboration with hospitals and medical research institutes, in the areas of Biomechanics of Leprotic hand and foot, Rehabilitation aids, Finite element method and Image and Signal processing applications etc. Recent emphasis of the division is to develop medical diagnosis modalities in the areas of Macro Micro-Hemodynamics, Laser and Artificial Neural Networks based Instrumentation.

The faculty in the **Solid Mechanics Division** are doing research in Stress analysis of plates and shells by finite element and boundary element techniques, Elasto-plastic analysis, Fracture mechanics, Fatigue, Reliability, Metal matrix composites, High temperature design and application of Image processing techniques.

The faculty in the **Fluid Mechanics Division** are doing research in Industrial Aerodynamics, Automobile Aerodynamics, Helicopter Aerodynamics, Aerodynamics of Wind turbines and Wind energy problems, Wind effects on buildings, structures and bridges, Flow induced vibration, Computational Fluid Dynamics and Atmospheric boundary layers, Internal flow problems and Flow through planar, conical and curved diffusers, Turbulent shear flows, Wall jets, Turbulence modelling.

The **Machine Dynamics** Division is engaged in research in the areas of Structural dynamics, Vibration and stress analysis using FEM techniques, Acoustics and noise control, Tribology and Maintenance engineering and Chaotic/non-linear vibrations.

2.1 New Courses Introduced

S.No.	Course No.	Title	Structure	Faculty
1.	ID 701	Constitutive Modelling in Continuum Mechanics	3 0 0 3	Dr.M.S.Sivakumar Dr.C. Lakshmana Rao Dr. Raju Sethuraman Dr.J. Raviprakash

2.2 Students on Roll

Programme	I Year	II Year	III Year	IV Year	V Year	Total
Ph.D.	5	5	16	4	6	36
M.S.	11	6	9	-	-	26
M.Tech	14	10	-	-	-	24
Total	30	21	25	4	6	86

2.3 Number of Scholarship/Fellowship holders

Programme	Institute	Others	Total
Ph.D.	22	3	25
M.S.	21	3	24
M.Tech	20	7	27
Total	63	13	76

2.4 Number of Degrees Awarded

Programme	Number Awarded
Ph.D.	11
M.S.	5
M.Tech	10
Total	26

3. Faculty and their Development:

3.1. Details of Faculty

Name and Qualification	Major area of Specialisation
Professors	
Aswatha Narayana, P.A., Ph.D.(IIT Madras)	Fluid Mechanics, CFD with heat transfer, non conventional energy resources and Atmospheric boundary layer
Ganesan, N., Ph.D.(IIT Madras)	Vibration, Stress Analysis, Tribology, Acoustics and Noise control
Lakshmana Gowda, B.H. Ph.D (IIT Madras)	Fluid Mechanics
Megha Singh, Ph.D.(Carolina)	Laser applications in medical diagnostics, Cardiovascular blood flow analysis
Narayanan, S., Ph.D.(IIT, Kanpur)	Vibration, Random Vibration, Chaos & Nonlinear Dynamical Systems, Acoustics and Noise Control
Palaninathan, R., Ph.D.(IIT Madras)	Structural Mechanics, Composite Structures, Metal Matrix Composites
Patil, K.M., D.Sc.(Washington)	Biomechanics, On-line diagnostic methods Indiabetic neuropathic foot & Rehabilitation Engineering

Raamachandran, J., Ph.D.(IIT Madras)	Solid Mechanics, Experimental Stress Analysis, Composite Structures, Biomechanics, Boundary Element Methods
Ramamurti, V., Ph.D.(IIT Madras)	Machine Dynamics, Vibration, Stress Analysis, Rotor Dynamics, Computer Aided Design
Ramjee, V., Ph.D.(IISc)	Fluid Mechanics, Turbulence
Radhakrishnan, S., Ph.D.(IIT Madras)	Rehabilitation Engineering, Biomechanics, Evoked Potential Studies
Srinivasa Prabhu, B., Ph.D.(IIT Madras) [Head]	Rotor Dynamics, Tribology, Maintenance Engineering
Associate Professors	
Balakrishnan, M., Ph.D.(IIT Madras)	Fluid Mechanics/Low speed Aerodynamics
Assistant Professor	
Lakshminarasimhan, J., Ph.D.(IIT Madras)	Fluid Mechanics: Incompressible Aerodynamics, Internal flows
Lakshmana Rao, C., D.Sc.(MIT, USA)	Fracture Mechanics, Micromechanical Modelling of Materials, Biomaterials, Boundary Element Methods
Ramasubba Reddy, M., Ph.D.(IISc.)	Biomedical signal processing and Bioinstrumentation
Santhanakrishnan, G., Ph.D.(IIT Madras)	Tribology, Composites-Materials & Processing, Natural Fibre Composites, Manufacturing Engineering
Sivakumar, M.S., Ph.D.(Louisiana State Univ.)	Plasticity, Solid Mechanics
Sujatha, C., Ph.D.(IIT Madras)	Machine Dynamics, Acoustics, Instrumentation, Condition Monitoring, Fibre Optics, Vehicular vibration
Swarnamani, S., Ph.D.(IIT Madras)	Instrumentation, Machine Dynamics, Tribology, Medical Ultrasonics, Acoustics, Biomedical Instrumentation
Emeritus Fellow	
Krishna Iyer, P., Ph.D.(IIT Madras)	Solid Mechanics, Stress Analysis, Elasticity and Plasticity
Visiting Faculty	
Chandramouli Padmanabhan, Ph.D.(Ohio State Univ.)	Non-linear vibrations, noise control, optimization and signal processing

Senior Scientific Officer, Gr.I

Thomas, G., M.Sc.(Madras)

Experimental Stress Analysis

Technical Officer

Ganesh, V., M.S.(IIT, Madras)

Engineering Mechanics, Stress Analysis,
Design of machine elements**3.2 Short-Term Courses/Workshops/Seminars/Symposia/Conferences/Training attended by the Faculty in recognized Academic Institutions and Public Sector Units**

S.No.	Name of Faculty	Title	Period/Duration
1.	Dr.M.S.Sivakumar	Inelasticity and Damage in Solids subject to Micro-structural change	Sept 25-27, 1996
2.	Dr.C.Sujatha	14th World Conference on NDT, New Delhi	Dec.8-13, 1996
3.	Dr.K.M.Patil	International Conf. in Bio-medical Eng. C.I.T. Coimbatore presented 4 papers	Dec 12-14, 1996
4.	Dr.S.Radhakrishnan	International Conf. on BME (Chaired a technical Session and presented papers - (INCONBME-96)	Dec 12-14, 1996
5.	Dr.M.Ramasubba Reddy	1. International Conf. on Biomedical Engg., CIT Coimbatore 2. A Seminar on 'Electro-physiology', Loyala College, Madras	Dec 12-14, 1996 Feb 17, 1997
6.	S.Narayanan	48th Annual General Meeting, Aeronautical Society of India, Thiruvananthapuram	31-1-97 to 1-2-97
7.	S.Narayanan	National Seminar on Engineering Education for the 21st Century I.I.T. Madras	17-19, Jan. 1997
8.	S.Narayanan	ASME 1996, International Mechanical Engineering Congress and Exposition, Atlanta, Georgia, USA	17-22 Nov. 1996
9.	S.Narayanan	SPIE Symposium on Smart Materials, Structures and MEMS, Bangalore	11-14 Dec, 1996
10.	S.Narayanan	International Conference on Dynamical Systems, Indian Institute of Science, Bangalore	10-15 Jan. 1997

3.4 Special Lecture(s) Delivered by the faculty in other Institutions

S.No.	Name of Faculty	Topic of Lecture	Delivered at	Date
1.	Dr.K.M. Patil	New on-line methods of analysis of foot pressure in diabetic neuropathy	Gogte Inst. of Technology Ydyamabag, Begaum	17 Feb. 1997
2.	Dr.M.Ramasubba Reddy	Biomedical Image Processing	RVR & JC College of Engg.College, Guntur, A.P.	Nov.29, 1996
3.	Dr.S.Narayanan	Noise Control in Motor	In Workshop on Development of Quieter Technologies, IISc Bangalor	Sept. 5, 1996
4.	Dr.S.Narayanan	Finite Element Applications in Acoustics	In short course on Finite Element Analysis and its Applications in Engineering Design Anna Univ.Chennai	Sept.1996
5.	S.Narayanan	Numeric-Analytical Methods for Contact-Impact Nonlinear Problems	Mechanics Seminar school of Mechanical Eng. Purdue University, West Lafayette, Indiana, USA	4-12-96
6.	S.Narayanan	Noise Control in Thermal Power Stations	BHEL Corporate R&D Centre, Vikas Nagar Hyderabad	20-12-96 and 21-12-96
7.	S.Narayanan	Chaos in Nonlinear Dynamical Systems	Anna University, Chennai	19-3-97,26-3-97
8.	Dr.C.Sujatha	Determination of Natural frequencies of Steam turbine blades	Univ. of Central Florida, Orlando USA	Feb.7-1997
9.	Dr.C.Sujatha	-do-	Westinghouse Power Generation, Orlando, USA	Feb.7-1997

3.5 Visits Abroad

S.No.	Name of Faculty	Country visited	Date	Purpose of visit
1.	Prof. Megha Singh	Germany Instt. of Physiology, RWTH, Aachen Germany	Aug 5-18, 1996	Sandwich Programme, DAAD
2.	Prof. Megha Singh	France Jt. Mtg. of the Society of Biomechanics & French Society of Biorheology	Sept 23-25 1996	Invited Lecture
3.	Dr. M.S. Sivakumar	Canada	Sept 23- Oct. 4 1996	1. To conduct a workshop 2. To attend a symposium
4.	Dr. S. Narayanan	U.S.A.	Nov. 17-22, 1996	To attend and present a paper at ASME, International Mech. Engg. Congress & Exposition at Atlanta, USA
5.	Dr. C. Sujatha	U.S.A.	Feb. 3-6, 199	To attend and present a paper at the XV International Modal Analysis Conference
6.	Dr. B.S. Prabhu	U.S.A.	Oct. 13-25 1996	To attend & present 2 papers at the 1996 ASME/STLE Tribology Conference, San Francisco, California

3.6. Honours and Awards

S.No.	Name of Faculty	Honours/Awards	Purpose
1.	Dr. K.M. Patil	Listed in Who is Who in Asia Pacific	
2.	Dr. Megha Singh	Marquis' Who's Who in Science and Engineering to be listed in Marquis IV Edition	Recognition
3.	S. Narayanan	FNAE	Elected Fellow of the Indian National Academy of Engg
4.	S. Narayanan	FAeSI	Elected Fellow of the Aeronautical Society of India

3.7 Books/Monographs Published

S.No.	Name of Faculty	Title	Publisher
1.	Dr. Megha Singh	Advance in Physiological Fluid Dynamics	Narosa/Springer

3.10 Membership/Fellowships in Professional Bodies

Dr. M. Ramasubba Reddy	Member of IEEE Member of Engineering in Medicine and Biology Society Life Member of Biomedical Society of India.
Dr.B.S. Prabhu	Member, American Society of Mechanical Engineers Member, Society of Tribologists and Lubrication Engineers Life Member, Tribology Society of India Life Member, Indian Institution of Plant Engineers Life Member, Association of Machines & Mechanics
Dr.V. Ramamurti	Fellow, INSA (FNA) Fellow, INAE (FNAE)
Dr.S. Narayanan	Elected Fellow of the Aeronautical Society of India
Dr.S. Swarnamani	Associate Member of Acoustical Society of America
Dr.C. Sujatha	Member, Acoustical Society of India Member, Indian Society for NDT
Dr.J.Lakshminarasimhan	Member, Aeronautics Life Member, Association for Machines & Mech. Life Member, IIPL Member, Tribology Society of India
Dr.G. Santhanakrishnan	Member, Aeronautics Life Member, Association for Machines & Mech. Life Member, IIPL Member, Tribology Society of India

4. Design and Development Activities:

4.1 Brief and Specific details of Process/Instruments/Equipments/Software Designed and Developed.

Prof.K.M. Patil & his student	Developed a new software for on-line methods of diagnosis by analysis of footpressure for diabetic neuropathy.
Prof. Megha Singh	Laser Reflectometer for tissue imaging.
Dr.S. Swarnamani	Expert System/Image Processing

4.2 New Facilities added and Major Equipment procured

Solid Mechanics Lab

1. 2 Pentium PCs and 2 (486) PCs bought for computer room
2. Video Blaster Card for image grabbing purposes

Fluid Mechanics Lab

1. A Flow Visualisation facility is added.

Machine Dynamics Lab

1. MATLAB
2. Data Acquisition System

5. Research and Consultancy

5.1 Sponsored Projects on hand (only ongoing)

S.No.	Title	Period	Funding Agency	Amount (In lakhs)	Co-ordinator(s)
01.	Development of Hand Held communicator aid for the spastics	2 years	Min. of Welafre	4.91	Dr.M.Ramasubba Reddy Mrs.Ranjana Shukla
02.	Cost Efficient Housing	2 years	DST	2.00	Dr.M.S.Sivakumar Dr.Jayanthi Srinivas
03.	STUDIES on the interaction between multiple supersonic Jets	2 years	ISRO	4.95	Dr.J.S.Sundararajan Dr.V. Ramjee
04.	S.E.A. Prediction of structural acoustics of Launch vehicle structure	Aug.95- Mar.98	ISRO	8.50	Dr.S. Narayanan Dr.S.Swarnamani
05.	Performance monitoring of wave energy power module vibration and noise	Jan.96- Mar.97	NIOT	9.775	Dr.S.Swarnamani Dr.B.S.Prabhu Dr.S.Narayanan Dr.Jagadeeshkumar (EED)

S.No.	Title	Period	Funding Agency	Amount (In lakhs)	Co-ordinator(s)
06.	Vibration Control using Piezo-Electric Actuators and Sensors	Jan.1997- Dec.2000	ARDB	8.61	Dr.S.Narayanan Dr.S.Swarnamani

5.2 Industrial Consultancy (only on going)

S.No.	Title	Industry	Value (In thousands)	Co-ordinator(s)
1.	Analysis of Flow Through ESP	ACC Babcock Ltd. Madras	100.00	Dr.M.Balakrishnan Dr.J.L.Narasimhan
2.	Seismic withstand test on 220 kV HCB Isolator	Hivelm Industries, Madras-32	25.00	Dr.V.Ramamurti Dr.S.Narayanan Dr.C.Sujatha
3.	Explanation on Crane and Hoist	Krans Cranes P. Ltd. Madras-20	1.00	Dr.V.Ramamurti
4.	Calibration of Vibration Tables at Site	Sundaram Clayton Ltd. Madras-50	10.00	Dr.S.Swarnamani Dr.C.Sujatha
5.	Seismic test on 390 kV Lightning Arrester	Crompton Greaves Ltd. Nasik	25.00	Dr.S.Swarnamani Dr.B.S.Prabhu Dr.N.Ganesan
6.	Torque Measurement on Motor Drive	Hivelm Industries, Madras-32	10.00	Dr.V.Ramamurti Dr.C.Sujatha
7.	Noise and Vibration Measurement on Motorcycle	Royal Enfield Motors Ltd. Madras-19	48.00	Dr.S.Narayanan Dr.S.Swarnamani
8.	Seismic test on 400 kV CT	BHEL, Bhopal	25.00	Dr.B.S.Prabhu Dr.S.Narayanan Dr.C.Sujatha
9.	Vibration and Strain Measurements on Vibrating Screen	Krittika Software P.Ltd.Hyderabad	20.00	Dr.V.Ramamurti Dr.C.Sujatha

S.No.	Title	Industry	Value (In thousands)	Co-ordinator(s)
10.	Seismic test on Centre Break Isolators	S&S Power Switchgear Ltd. Madras-116	37.00	Dr.S.Narayanan Dr.N.Ganesan Dr.S.Swarnamani Dr.C.Sujatha
11.	Opinion on Instrumentation	Measurement Technology, Madras-17	2.00	Dr.S.Swarnamani
12.	Noise level test Axial Fan	NADI Airtechnics, Madras-118	5.00	Dr.S.Swarnamani Dr.S.Narayanan
13.	Calibration of Vibration Meter	GEA Energy Systems (I) Ltd. Madras-18	1.50	Dr.C.Sujatha Dr.S.Swarnamani
14.	Seismic test on Lightning Arrester	Crompton Greaves Ltd. Nasik422 010	25.00	Dr.C.Sujatha Dr.V.Ramamurti Dr.S.Narayanan
15.	Development	Kirloskar Bros.Wadi-416 308	150.00	Dr.V.Ramamurti Dr.S.Swarnamani Dr.C.Sujatha
16.	Three direction Ground vibration measurements	Guindy Machine Tools Ltd. Madras-601 302	8.00	Dr.V.Ramamurti Dr.S.Swarnamani
17.	Moment of Inertia of Rotors	Lucas-TVS Ltd. Madras-50	6.00	Dr.S.Swarnamani
18.	Seismic test on M.O.Arresters	Jayashree Insulators, Baroda-390005	50.00	Dr.V.Ramamurti Dr.C.Sujatha Dr.N.Ganesan
19.	Vibration Measurement on Mill and Bunker Building	NTPC, Ramagundam	276.00	Dr.V.Ramamurti Dr.S.Swarnamani Dr.C.Sujatha Dr.A.MeherPrasad [Civil Engg.]
20.	Noise level survey	Mercury Tyles Industries, Madras 600 118	3.00	Dr.S.Swarnamani
21.	Seismic test on 72.5 kV Breaker	Crompton Greaves Ltd. Nasik	21.00	Dr.S.Swarnamani Dr.V.Ramamurti Dr.S.Narayanan
22.	Vibration testing of GP volve	Brakes India Ltd. Madras	20.00	Dr.V.Ramamurti Dr.S.Swarnamani

S.No.	Title	Industry	Value (In thousands)	Co-ordinator(s)
23.	Evaluation of Lateral and Torsional Critical Speeds	LPSC, Valiamala, Trivananthapuram	54.93	Dr.V.Ramamurti
24.	Dynamic characteristic of Casings	-do-	42.25	Dr.V.Ramamurti
25.	Dynamic analysis of Turbine Blade and disc	-do-	191.50	Dr.V.Ramamurti
26.	Estimation of coolant requirement and temperature of bearings	LPSC,Valiamala, Trivananthapuram	87.32	Dr.B.S.Prabhu
27.	Estimation of Leakage between Fuel and Exidiser Pumps	LPSC,Valiamala,Trivanantha puram	118.30	Dr.B.S.Prabhu
28.	Estimation of stiffness and bearings load capacity	LPSC,Valiamala,Trivanantha puram	87.32	Dr.B.S.Prabhu
29.	Dynamic characteristics and Evaluation of damping characteristics	LPSC,Valiamala,Trivanantha puram	192.96	Dr.B.S.Prabhu
30.	Stability analysis of rotor	LPSC,Valiamala,Trivanantha puram	192.962	Dr.B.S.Prabhu
31.	Seismic test on 145 kV 1250 Amp. Double Breaker Isolator	Kaushik Switchgears(P) Ltd. Mugappair (West)Madras-50	25.00	Dr.C.Sujatha Dr.V.Ramamurti Dr.G.Santhana-krishnan
32.	Free Vibration testing of 12" control valve	MIL Controls Ltd. Aluva 683 101	29.00	Dr.C.Sujatha Dr.S.Narayanan Dr.G.Santhana-krishnan

S.No.	Title	Industry	Value (In thousands)	Co-ordinator(s)
33.	Monitoring and diagnosis of vibration on Mills	EID Parry Ltd. Madras 57	12.00	Dr.V.Ramamurti Dr.C.Sujatha
34.	Seismic test on 42 kV 10 KA Lightning Arresters	Oblum Electrical Industries P. Ltd. Hyderabad 37	15.00	Dr.S.Swarnamani Dr.N.Ganesan Dr.G.Santhana-krishnan
35.	Seismic withstand test on 400 kV HCB Isolator	Hivelm Industries, Madras-32	31.00	Dr.V.Ramamurti Dr.C.Sujatha Dr.B.S.Prabhu
36.	Seismic test on 132/220 kV CT and 220 kV CT by Free Vibration	Asea Brown Boveri Ltd. Vadodara 390 013	30.00	Dr.C.Sujatha Dr.N.Ganesan Dr.S.Narayanan
37.	Seismic withstand test on 420 kV Panjograph Isolator	Hivel Industries Ltd. Madras	31.00	Dr.V.Ramamurti Dr.C.Sujatha Dr.B.S.Prabhu
38.	Torque testing of ERW tubes	Tube Products of India Madras 54	10.00	Dr.C.Sujatha Dr.S.Swarnamani
39.	Seismic test on Busduct	BHEL,Jhansi 284 129	50.00	Dr.S.Swarnamani Dr.V.Ramamurti Dr.N.Ganesan
40.	Seismic test on 60 kV Lightning Arrester	LAMCO Lightning Arrester Mfg. Co. Ltd. Hyderabad	10.00	Dr.S.Swarnamani Dr.N.Ganesan Dr.V.Ramamurti
41.	Vibration and shock test	BHEL Bhopal	35.00	Dr.S.Swarnamani Dr.S.Narayanan Dr.B.S.Prabhu
42.	Seismic test on CTs and CVTs with structure	Asia Brown Boveri Ltd. Vadodara 390 001	75.00	Dr.S.Swarnamani Dr.N.Ganesan Dr.G.Santhana-krishnan
43.	Torque measurement	Tuticorin Alkali Chemicals & Fertilisers Ltd. Madras600 018	8.00	Dr.S.Swarnamani
44.	Strain measurement of Sugarcane	KCP Sugar & Industries Corpn. Ltd. Chennai 6	25.00	Dr.V.Ramamurti Dr.Swarnamani

S.No.	Title	Industry	Value (In thousands)	Co-ordinator(s)
45.	Seismic test on Busduct	BHEL,Jhansi	25.00	Dr.S.Swamamani Dr.N.Ganesan Dr.G.Santhana-krishnan
46.	Theoretical Analysis of STD	T.I.Cycle of India, Ambattur	30.00	Dr.V.Ramamurti
47.	Critical speeds of Helical gear boxes	Walchandnagar Industries Ltd. Walchandnagar 413 114	30.0	Dr.V.Ramamurti

5.3 RBIC (only on going)

S.No.	Name of the Investigator/Co-Investigator	Number	Value (In lakhs)
1.	Dr.M.S. Sivakumar Mr.G.Thomas	1	9.0
2.	Dr.M.S. Sivakumar Dr.C. Lakshmana Rao	1	4.0
3.	Dr.S. Narayanan Dr.N. Ganesan	1	9.8

5.4 Research Publications

a) Journals:

1. Patil, K.M., Braak, L.H. and Huson, A., "Analysis of stresses in two dimensional models of normal and neuropathic feet", J. of Medical and Biological Engineering and Computing, U.K., Vol.34, 280 - 284.
2. Shanti, J., Patil, K.M., Braak, L.H. and Huson, A., "Stresses in a 3D two arch model of a normal human foot", Mechanics research Communication, U.S.A., Vol.23, No.4, 1996, 387 - 393.
3. Prasad, G.V.K., Srinivasan, S and Patil, K.M., "A new DSP-based multichannel EMG acquisition and analysis system", Computers and Biomedical Research, Vol. 29, No.4, 1996, 395 - 406.
4. Patil, K.M., Babu, M., Oommen, P.K. and Malaviya, G.N., "On line system of measurement and analysis of standing and walking foot pressures in normals and patients with neuropathic feet", Innov. Tech. Biol. Med., France, Vol.17, No.5, 1996, 401 - 408.
5. Prakash B, Singh M. Optimum kinetic energy dissipation in blood flow in glass capillaries by flow field determination. Analysis of curvature effect by axial tomographic and image velocimetry techniques. Biorheology. 33: 59-74, 1996
6. Singh M, Kumaravel M. Influence of pentoxifylline and disprin on aggregation and deformability of erythrocytes under in vitro conditions. Ind J Biochem Biophys 33:199-205, 1996.

7. Singh M, Middleberg J, Rath HJ. deformation of erythrocytes and aggregates under microgravity during sedimentation. *Micro-gravity Sci. Technol.* 8:256-260, 1995.
8. Shanthi S, Singh M. Laser reflectance imaging of internal organs under in vitro conditions. *Innov Technol Biol Med.* 17, 443-451, 1996.
9. G.C.Mohankumar, J. Raamachandran and S. Radhakrishnan Computer Aided occlusal pressure measurement: An In vivo experimentation on oral surgical patients in *Innovation and Technology in Biology and Medicine*, vol 17, No.4, Sept. 1996, pp 307 - 314.
10. An experimental investigation on the static and dynamic characteristics of journal bearings under the influence of misalignment, will appear in *ASME Journal of Tribology*, (Co-authors : P. Arumugam and S. Swamamani).
11. An experimental investigation on the misalignment effects in journal bearings, will appear in *STLE Tribology Transactions*.
12. Design considerations of overcrank and undercrank shears - a comparative study, V. Ramamurti and S. Gowri, *Jou. Material Processing Tech.* V 57, n3/4, pp 225-232 (1996).
13. Studies on the determination of natural frequencies of Industrial turbine blades, V. Ramamurti, M. Mahesh Bhat and C. Sujatha, Presented at the 15th ASME Biennial Vibration conference, 1995, *Jou. of Sound and Vibrations*, V 196, pp.681-703 (1996).
14. Dynamic response of transmission housings, V. Ramamurti, *Shock and Vibration Digest*, V 28, n4, pp.15-18 (1996).
15. Investigation into the experimental and numerical simulation of a shaping machine, V.G. Reddy, P.T.Raju, V. Ramamurti and R. Maddhsudan, *ASME Design Conference; DETC-DAC-1098* (1996), California.
16. Design aspects of heavy duty moulding boxes, V. Ramamurti, *Jou. of Institution of Engineers (India) (M.E.)*, V 76, pp 225-228 (1996).
17. Computer Aided Design - Indian Scenario, V. Ramamurti, *Proc. INSA*, V62(3)A, pp 189-196,(1996).
18. S.Senthil and S.Narayanan, "Optimal Preview Control of a two dof model using Stochastic Optimal Control Theory", *Vehicle System Dynamics* 25(6) June 1996, 413-430.
19. K.Jayaraman and S.Narayanan, "Chaotic Oscillations in pipes conveying pulsating fluid", *Nonlinear Dynamics*, 1996, 10, 333-357.
20. K.Renji, P.S.Nair and S.Narayanan, "Modal Density of Composite Honeycomb Sandwich Panels", *Journal of Sound and Vibration*, 1996, 195(5), 687-699.

Abstract:

1. Ramakrishnan, S., Grebe, R, Klaus Vietzke, Flieger R, Rosi Degnhardt, Megha Singh and Schmid-Schonbein H, "Influence of local anesthetic on deformability of red blood cells", *XIth International Biophysics Congress, Amsterdam, The Netherlands*, Vol.65, page 207, Aug. 1996. 0079-6107.

2. Megha Singh and Kumaravel, M. "Sequential analysis of erythrocyte aggregation process in health and diseases", Archives of physiology and Biochemistry, Palais des Congres de Nancy, France, Vol. 104, No.5, Sept. 1996, 1381-3455.

b) Conferences:

1. Prasad, G.V.K., Patil, K.M. and Srinivasan, S., "Spectral analysis of EMG signals using TMS 320C25 DSP processor", Proceedings of the 5th National Conference of Biomechanics, I.I.T., Madras, India, Feb 22-24, 1996, 144-147.
2. Shanti, J., Patil, K.M., Braak, L.H. ;and Huson, A., "Stress analysis in a model of a normal human foot with soft tissue", Proceedings of the 5th National Conference of Biomechanics, I.I.T., Madras, India, Feb 22-24, 1996, 36-39.
3. Bhatia, M.M., Patil, K.M. and Kiezer, W., "A comparative study of the foot-pressure parameters obtained from the barograph and the EMED-FO1 system ", Proceedings of the 5th National Conference of Biomechanics, I.I.T., Madras, India, Feb 22-24, 1996, 29-32.
4. Bhatia, M.M. and Patil, K.M., "The effect of walking speed on barefoot pressures", Proceedings of the 5th National Conference of Biomechanics, I.I.T, Madras, India, Feb 22-24, 1996, 33-35.
5. Ramakrishnan, S., Patil, K.M. and Eswaran, C., "3D Modelling of biological molecules", Proceedings of the 5th National Conference of Biomechanics, I.I.T., Madras, India, Feb 22-24, 1996, 123-126.
6. Bhatia, M.M. and Patil, K.M., "A new index for quantifying walking foot pressure patterns in Hansen's disease", Proceedings of the 15th Southern Biomedical Engineering Conference, University of Dayton, Ohio, USA, March 29-31, 1996, published by IEEE, 43-46.
7. Patil, K.M., and Bhatia, M.M., "Normalized walking foot pressure patterns in Hansen's disease", Proceedings of the International Conference in Biomedical Engg., C.I.T. coimbatore, India, Dec. 1996, II 13-16,
8. M. Babu, Patil, K.M., Eswaran, C and Bhatia, M.M., "Some temporal transforms of image sequences for foot pressure analysis", Proceedings of the International Conference in Biomedical Engg., C.I.T. Coimbatore, Dec. 1996, II 22-25.
9. Patil, K.M. Shanti, J and Oommen, P.K., "Mechanics of plantar ulcers by stress analysis in the 3D model of normal and neuropathic feet", Proceedings of the International Conference in Biomedical Engg., C.I.T., Coimbatore, Dec. 1996, II 9-12.
10. Sankaran, B., Veth, Mariken and Patil, K.M., "Mechanism of development of deformity in Hansen's disease", Proceedings of the International Conference in Biomedical Engineering, C.I.T, Coimbatore, Dec.96, II 5-8.
11. Umranl J, Prakash B, Namasivayam A. Blood flow analysis in mesenteric arterial bifurcation by axial tomography and image velocimetry techniques. In: Singh M, Saxena VP(eds). Recent Advances in Physiological Fluid Dynamics, New Delhi, Narosa/Springer, 1996, pp 109-115.
12. H.Sujana and S.Swamamani, Application of self organizing feature map for ultrasonic diagnosis of ocular melanoma, to be presented at Annual meeting Madras Regional Chapter - Acoustical Society of America, Aug.18-19, 1996, IIT, Madras.

13. D.Sudheer Kumar Reddy, S.Swarnamani and B.S.Prabhu, Dynamic analysis of gas lubricated foil bearings used for high speed applications, Presented at National Conference in Air Breathing Engines, Dec.28-29, 1996, IIT Madras.
14. C.Sujatha and S.Venkatesh, 'Diagnosis of defects in rollingelement bearings through cepstrum analysis', Journal of Plant Engineering, pp.25-39, 1997.
15. A.Thanooja, C.Sujatha, S.Swarnamani and M.Hanumantha Rao, 'The use of modal parameters in nondestructive evaluation of damage in composite structures, dProc. of the 14th World Conference on Non-Destructive Testing, Dec.873, 1996, N.Delhi, India, pp.1141-1146.
16. C.Sujatha and Lt.R.Hegde, 'Determination of the damping ratios of lightly damped structures', Accepted for publication in Experimental Techniques.
17. C.Sujatha and S.V.Muthukrishnaselvam, 'Sound and vibration vs. cutting forces in drill failure prediction', Proc. of 17th All India Manufacturing Technology Design and Research Conference, Jan.9-11, 1997, Warangal.
18. C.Sujatha, S.Thanooja, M.Hanumantha Rao and S.Swarnamani, 'A study on change in modal parameters with damage in composite specimens', Proc. of XV International Modal Analysis Conference, Feb.3-6, 1997, Orlando, U.S.A., pp.1607-1613.
19. Comparison of beam and plate theories for free vibrations of metalmatrix composite pretwisted blades, S.Mohammed Nabi and N.Ganesan, Journal of Sound and vibration, Vol.189(2) pp 149-160. (1996).
20. Interlaminar Stresses in shells of revolution, S.Ramalingeswara Rao and N.Ganesan, Mechanics of Composite Materials and Structures, Vol.3, pp 321-339, (1996).
21. A Modified Semi-Analytical approach towards the modelling of a shaft-disc system, D.Satish Kumar, C.Sujatha and N.Ganesan, Computers and Structures, Vol.61(1) pp 189-191, (1996).
22. Dynamic Studies on beams with unconstrained layer damping treatment, P.K.Roy and N.Ganesan, Journal of Sound and Vibration, Vol.195(3) pp 417-427, (1996).
23. Frequency Response of Shell-Plate Combinations, A.Joseph Stanley and N.Ganesan, Computers and Structures, Vol.59(6) pp1083-1094, (1996).
24. Nagaprasad V, Kumaravel M, Singh M. Hemorheometer - an optical computerized method to measure deformability of erythrocytes. In: Radhakrishnan S, Reddy MR (eds). Advances in Biomedical Engineering, Madras, Allied Pub., 1996, pp 109-112.
25. Prakash B, Singh M. Determination of erythrocyte and vascular parameters in blood flow through microcirculation. In: Niimi H, Xiu R, Sawada T, Zheng C (eds). Microcirculation approach to asian traditional medicine: strategy of the scientific evaluation. Amsterdam, Elsevier Science, 1996, ch 9.
26. Vimal Kumar Y.M., Radhakrishnan S. and MRS Reddy. "A new algorithm for the extraction of somatosensory evoked potentials", Proc. of Int. Conf. on BME (INCONBME '96), Dec 1996, pp III-4 to III-7.
27. Kirankumar, S.Radhakrishnan and P.K. Oomen "Quantitative evaluation of muscle grading based on EMG on" -Proc. of Int.Conf.on BME (INCONBME'96) Dec 1996.III-8 to III-11.

28. Nagaraj, S. Srinivasan and S.Radhakrishnan "Spectral estimation of Brainstem Auditory Evoked Responses by Auto regressive modelling", Proc. of INCONBME '96 Dec. 1996, pp III-16 to III-19
29. Analysis of ECG by Pole-zero models, S.P.Naidu, and M.R.S.Reddy, XV Southern Biomedical Engineering Conference, March 29-31, 1996, Dyton, Ohio.
30. Correlation of Autonomic function tests to the HRV signal analysed using short time Fourier Transform, T. Srikanth, M.R.S. Reddy, D. Prabhakar and M.R. Sridevi, XV southern Biomedical Engineering Conference, March 29-31, 1996, Dyton, Ohio.
31. Model order determination of ECG signals using rational function approximations, Joseph S. Paul, V. Jagadeeshkumar and M.R.S. Reddy, accepted for presentation at Intl. Workshop on Image and Signal Processing, Manchester, U.K., Nov. 4-7, 1996.
32. Applications of Wigner-Ville Distributions on HRV signals as a tool for the detection of cardiac Atonomic neuropathy. T. Srikanth and M.R.S. Reddy, Accepted to the International Conf. on Biomedical Engineering, to be held on Dec. 12-14, 1996, at CIT, Coimbatore.
33. Improved algorithm for the extraction of somatosensory evoked potentials, Y.M. Vimal kumar, S. Radhakrishnan and M.R.S. Reddy, Accepted to the International Conf. on Biomedical Engineering to be held on Dec. 12-14, 1996, at CIT, Coimbatore.
34. On a signal subspace approach to QRS detection, Joseph S. Paul, V. Jagadeeshkumar and M.R.S. Reddy, Accepted to the International Conf. on Biomedical Engineering, to be held on Dec.12-14, 1996, at CIT, Coimbatore.
35. A practical approach to ECG classification and localisation of Myocardial Infarction, V. Madhavi and M.R.S. Reddy, Accepted to the International Conf. on Biomedical Engineering, to be held on Dec.12-14, 1996, at CIT, Coimbatore.
36. An adaptive correlation based data compression method for ECG, Joseph S. Paul, Jagadeesh Kumar V. and Reddy M.R.S., Proce. of the 5th National Conf. of Biomechanics, I.I.T, Madras, Feb. 22-24, 1996, pp: 160-162.
37. A study on spinal somatosensory evoked potentials, Vimal Kumar Y.M., Radhakrishnan S. and Reddy M.R.S., Proce. of the 5th National Conf. of Biomechanics, I.I.T, Madras, Feb. 22-24, 1996, pp:169-172.
38. Multichannel scan along polygonal approximation for ECG data Compression, Naidu S.P. and Reddy M.R.S., Proce. of the 5th National Conf. of Biomechanics, I.I.T., Madras, Feb.22-24, 1996, pp:177-180.
39. Study of automatic neuropathy using time HRV signal analysis, Srikanth.T and Reddy M.R.S., Proce. of the 5th National Conf. of Biomechanics, I.I.I, Madras, Feb. 22-24, 1996, pp:181-184.
40. An automated approach to QRS complex and T wave delineation, Vedula Madhavi and Reddy M.R.S., Proce. of the 5th National Conf. of Biomechanics, I.I.T, Madras, Feb. 22 - 24, 1996, pp:185-188.
41. B.H.Lakshmana Gowda, P.J.Joshy and S.Swarnamani, Device to suppress vortexing during draining from cylindrical tanks, J.Space Craft and Rockets, V34, n2, Mar-April, 1997.

42. P.Arumugam, S.Swarnamani and B.S.Prabhu, Experimental identification of linearised oil film coefficients of cylindrical and tilting pad bearings, *Jl. of Engg. for Gas Turbines and Power (ASME)*, 1995, V 117, pp.593-599.
43. H.Sujana, S.Swarnamani and S.Suresh, "Application of artificial neural networks for the classification of liver lesions by image texture parameters", *Ultrasound in Medicine and Biology*, Vol 22, 9, 1996, pp 177-181.
44. P.Arumugam, S.Swarnamani and B.S.Prabhu, An experimental investigation on the static and dynamic characteristics of journal bearings under the influence of twisting misalignment, *Trans. ASME Tribology*, Jan.1997, V119/3, pp188-192.
45. V.Krishnakumar and S.Swarnamani, Tribological Behaviour of plasma sprayed Al_2O_3 and TiO_2 ceramic Hard coatings under Dry contact *Tribotest Journal*, 3-2, Dec.1996 (3), 179-198.
46. Reji Paul, S.Narayanan and S.Swarnamani, 'Transient response of multilayered viscoelastic plate to an oblique plane Acoustic Wave' Paper presented at the Second Tehnical Sessions of the Madras-India Regional Chapter of the Acoustical Society of America, 18-19, August 1996, Madras.
47. S.Narayanan and P.Sekar, "Bifurcation and Chaos in Parametrically Excited Contact Vibrations". Paper presented at the 1996 ASME-Internatioal Mechanical Engineering Congress and Exposition. Atlanta, Georgia, Proc. DE. Vol.91, "Nonlinear Dynamics and Control", Ed. A.K.Bajaj et.al. 59-65.
48. S.Narayanan and S.Swarnamani, "Industrial Acoustics and Standardisation", Proc. National Symposium on Acoustics (NSA96), *J.Acous.Soc.India*, Vol.XXIV, 1996, IT5.1-5.26.
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50. S.Narayanan and L.Somasundaram, "Active Vibration Control of Beams and Plates with piezoelectric materials", Paper presented at SPIE Far East and Pacific Rim Symposium on Smart Materials, Structures and MEMS, Bangalore 11-14, Dec.1996.
51. P.Sekar and S.Narayanan, "Numeric-Analytical Methods for nonlinear dynamic system analysis". Poster paper presented at the International conference on Dynamical Systems, IISc, Bangalore, 10-15, Jan. 1997.
52. S.Narayanan, 'A New Mechanical Engineering Curriculum', Proc. National Seminar on Engineering Education for the 21st Century, Jan. 1997, 100-103, Madras.
53. A.Raghothama and S.Narayanan, "Aeroelastic Chaacteristics of a Two dimensional Airfoil with Nonlinear Stiffness", Paper presented at the 48th AGM of the Aeronautical Society of India, Thiruvananthapuram, Jan.-Feb.,1997, Proc. Ed. A.R.Acharya et.al., 187-197.
54. M.Ramesh and S.Narayanan, "Control of Chaotic Motions of a two-dimensional air foil", Paper presented at the 48th AGM of the Aeronautical Society of India, Thiruvananthapuram, Jan-Feb., 1997. Proc. Ed. A.R.Acharya et.al., 339-350.

4.3 Chemical Engineering

4.3.1 Introduction:

The Department of Chemical Engineering was established in 1959. Now, Ph.D., M.S., M.Tech. and B.Tech. programmes are being offered.

4.3.2 Details of Faculty:

Name and Qualifications	Major Area of Specialisation
Professors	
M.S. Ananth, Ph.D(Florida)	Thermodynamics, Mathematical Modelling
A.R. Balakrishnan, Ph.D(Waterloo)	Heat Transfer, Computer Aided Design
M.Chidambaram, Ph.D(IISc)	Non-Linear Control, Periodic operation of Reactors
Ch. Durgaprasada Rao, Ph.D(Andhra)[Head]	Mathematical Modelling, Computer Process Control
K. Krishnaiah, Ph.D(IIT Madras)	Chemical Reactor Analysis and Design, fluidization
D.V.S.Murthy, Ph.D(IIT Madras)	Particle Technology, Environmental Engineering
N.R. Neelakantan, Ph.D(Swansea)	Polymer Processing, Rheology
T. Panda, Ph.D(IIT Delhi)	Biochemical Engineering and Bio Technology, Protoplast Fusion Technology
V.S.Ramachandra Rao, Ph.D(IIT Madras)	Internal Model Control, Adaptive Control
T.K.Ramanujam, Ph.D(IIT Madras)	Environmental Engineering, Particle Technology
S. Subba Rao, Ph.D(Connecticut)	Mass Transfer, Computer Aided Design
Y.B.G. Varma, Ph.D(IIT Madras)	Multiphase Systems, Process Development, Equipment Design
T. Venkatram, Ph.D (IISc)	Process Development, Heat Transfer, Membrane Separation, Equipment Design
Associate Professors	
S. Sankaranarayanan, Ph.D(Queens Land)	Optimum Control of Grinding Circuits and other Mineral Beneficiation Process
Shankar Narasimhan Ph.D(North Western)	Computer aided design
P.Sesha Talpa Sai Ph.D(IIT Madras)	Chemical Reactor Analysis and Design, Rotary Kilns
T.Swaminathan, Ph.D(IIT Kanpur)	Environmental Management, Biotechnology, Membrane Technology
Assistant Professors	
J. Ravi Prakash, Ph.D(IISc)	Mechanics of Granular Materials. Rheology
Sachin C Patwardhan Ph.D(IIT, Bombay)	Process Control

Srinivas Jayanti, Ph.D(Imperial)

Computational Fluid Dynamics

Adhoc Faculty

Abhijit Deshpande, Ph.D (Washington)

Polymers and Polymeric Materials

Susy Varughese, Ph.D(IIT, Kharagpur)

Polymers and Elastomeric Materials

Emeritus Professor

A. Baradarajan, Ph.D(IIT Madras)

Bio-reactors, Modelling of Bio-reaction processes,
Solid-Solid reactions

4.3.3. Students on Roll

Programme	I Year	II Year	III Year	IV Year	V Year	Total
Ph.D.	3	6	4	11	22	46
M.S.	4	2	10	1	-	17
M.Tech.	21	16	-	-	-	37
B.Tech.	51	46	50	55	-	202
Total	79	70	64	67	22	302

4.3.4. Number of Scholarship/Fellowship holders:

Programme	Institute Scholarship	Others	Total
Ph.D.	31	2	33
M.S.	12	-	12
Total	43	2	45

4.3.5. Number of Degrees Awarded:

Programme	Number
Ph.D	14
M.S.	2
M.Tech.	23
B.Tech.	49
Total	88

4.3.6. Short-term Courses/Workshops/Seminars/Symposia/Organised:

S.No.	Co-ordinator(s)	Title of Course/Workshop/Seminar/Symposia/Conference
1.	Prof. Y.B.G. Varma Prof. M.S.Ananth Prof. A.R.Balakrishnan Prof. Ch.D.P.Rao	International Conference on Advances In Chemical Engineering (ICACHE 96)
2.	Prof. M.S.Ananth	Advanced Technology for the 21st century
3.	Prof.M.S.Ananth	AICTE workshop on Accreditation
4.	Prof.T.K.Ramanujam	Environmental Impact Assesment

4.3.8 Short-term Courses/Workshops/Seminars/Symposia/Conferences/Training attended by the Faculty in recognised Academic Institutions and Public Sectors:

S.No.	Name of Faculty	Title	Period/duration
1.	Prof.T.K.Ramanujam	Hazardous Waste	18-3-97
2.	Prof.T.K.Ramanujam	Flow of Bulk Solids In Silos	23/24-1- 97
3.	Prof.T.Venkataram	CHECON 96	Dec.96

4.3.9 Lecture(s) delivered:

S.No.	Name of Faculty	Title	Delivered at	Period/Duration
1.	Dr.S.Jayantl	Multiphase Flow	IIT Madras	Dec. 96
2.	Dr.P.S.T.sai	Reaction Eng.	SIT,Tumkur	April 96
3.	Prof.T.K.Ramanujam	EIA Methodologies	NPC	15-5-96
4.	Prof.Ch.D.P.Rao	Intelligence Processing of materials	IGCAR Kalpakkam	--

4.3.10 Visits Abroad:

S.No.	Name of the faculty	Country visited	Date	Purpose of visit
1.	Prof.Ch.Durga Prasad Rao	Germany	2.5.96-2.8.96	DAAD

4.3.11. Distinguished Visitors to the Department:

S.No.	Name of the visitor and Occupation	Date of visit	Purpose of visit (Lecture/Discussion)
1.	Prof.K.E.Gubbins Ithaca, USA	December 96	Lecture
2.	Prof.K.R.Rajagopal Pittsburgh, USA	December 96	Lecture
3.	Prof.D.Ramakrishna W.Lafayette, USA	December 96	Lecture
4.	Prof.A.Nir IIT, Israel	December 96	Lecture
5.	Prof. Natti S Rao Germany	December 96	Lecture

4.3.12. Sponsored Projects: under Progress:

S.No.	Title	Funding Agency	Amount (In Lakhs)	Coordinator(s)
1.	Robust Control of a M.S.F Desalination plant	IFFWSAT	7.30	Dr.M.Chidambaram
2.	Alternative to CFCS	Indo-German	-	Dr.A.R.BalaKrishnan and Dr.S.S.Murthy
3.	Model Predictive control of Nonlinear Processes using Laguerre Models	AICTE	7.00	Dr.Sachin C Patwardhan
4.	Pilot plant studies on the production of activated carbon from coconut shells in a Fluidized Bed	CSIR	3.00	Dr.K.Krishnaiah
5.	Riboflavin enriched poultry feed	BDT	25.00	Prof.M.S.Ananth
6.	Effect of tube diameter on gas-liquid counter-current flow and flooding	DST	11.92	Dr.S.Jayanti Prof.A.R.Balakrishnan
7.	Environmental Engg.	MHRD	5.00	Prof.T.K.Ramanujam
8.	Flow of coal through Bins and Chuters	CBIP	0.32	Prof.T.K.Ramanujam

4.3.13. Major consultancy Assignments:

S.No	Title	Funding Agency	Amount (in Lakhs)	Coordinator(s)
1.	Water analysis		0.70	Prof.T.K.ramanujam

BIOSCIENCES & BIOTECHNOLOGY:

The activities of the members are being listed in the dept. of chemical engineering to which the members belong.

4.3.14. Research Publications:

1. S.Jayanti, T.Kandlbinder & G.F.Hewitt, "Turbulent flow in a pipe with Intermittent rough patches: An analogue of annular two-phase flow", Chem.Eng. Comm., vols. 141-142, pp 237-259, 1996.
2. S.Jayanti, A. Tokarz & G.F. Hewitt, "Theoretical investigation of the diameter effect on flooding in countercurrent flow", Int.J.Multiphase Flow, vol. 22, p. 307-324, 1996.
3. A Wolf, S. Jayanti & G.F.Hewitt, "On the nature of ephemeral waves in vertical annular flow", Int. J. Multiphase Flow, vol. 22 325-333, 1996.
4. S.Jayanti & J.Pavithra, "Hydrodynamic study of jet mixing in vessels using the CFD code PHOENICS", Proc. of the International Conference on Advances in Chemical Engineering, p.125-130, Dec.11-13, 1996.
5. S.Jayanti & G.F.Hewitt, "Hydrodynamics and heat transfer of wavy thin film flow", Int.J.Heat Mass Transfer, vol. 40, p.179-190, 1997.
6. The'odore & T. Panda, "Self-directing optimization of B-1,3-T.harzianum in batch stirred tank bioreactor", Bioprocess Eng., 14(2), 111-112, 1996.
7. S.Siva Kesava, T. Panda & S.K. Rakshit, "Production of ethanol by immobilized whole cells of Zymomonas mobilis in an expanded bed bioreactor", Process Biochemistry, 31, 449-456, 1996.
8. A.Kapat, S.K. Rakshit & T.Panda, "Parameters optimization of chitin hydrolysis by T.harzianum chitinase under assay conditions", Bioprocess Eng., 14, 275-279, 1996.
9. K.Jagannadha Rao & T. Panda, "Effect of mode of operation of bioreactors on the biosynthesis of penicillin amidase in E.coli", Bioprocess Eng., 14, 317-321, 1996.
10. A.Kapat, S.K.Rakshit & T.Panda, "Optimization of carbon and nitrogen sources in the medium and environmental factors for enhanced production of chitinase by T.harzianum", Bioprocess Eng., 15, 13-20, 1996.
11. H.M.Chen, Y.Li, T.Panda, F.U.Buehler, C.Ford & P.J.Reilly, "Effect of replacing helical glycine residues with alanines on reversible and irreversible stability and production of Aspergillus awamori glucoamylase", Protein Engg., 9, 499-505, 1996.
12. S.Siva Kesava & T.Panda, "Comparative analysis of ethanol production by immobilized whole cells of Zymomonas mobilis in a continuous flow expanded bed bioreactor and a continuous flow stirred tank bioreactor", J. of Indus.Microbio., 17, 11-14, 1996.
13. T.Panda & K. Jagannadha Rao, "Fermentation stoichiometry: Some elementary but neglected considerations", J. of Energy, Heat & Mass Transfer, 19, 127-131, 1997.
14. S.R.Nair & T.Panda, "Statistical optimization of medium components for improved synthesis of pectinase by Aspergillus niger: Bioprocess Eng., 16(3) 169-173, 1997.
15. Ramesh Viswanathan, N.Ramesh & T. Venkatram, "Behaviour of INCONEL-600 in the presence of H₂S at high temperatures", Indian J. of Chemical Technol. 3(4), 224-226, 1996.
16. S.Deepak & T.Venkatram, "Computer aided design of Vapour-n.c. gas heat transfer systems using alburn-Hougen Procedure", Indian Chem. Engr., Section A, 38(2), 62-66, 1996.

17. S.Deepak & T. Venkatram, "A Comparative study of thermal design of Some Vapor-n.c. gas systems", *Indian Chem. Eng. Section A*, 38(3), 113-115, 1996.
18. Radhwan, K.H. & Ramanujam, T.K., "Studies on Organic reduction Yegnarasad. K. & Ramanujam, T.K. "Enhancement of Gas-Liquid mass transfer in a modified reverse flow jet loop reactor with three phase system", *Chem. Eng. Sci.* Vol. 50, No.18, p 2997-3000, 1996.
19. Radhwan, K.H. & Ramanujam, T.K. "Influence of COD/NH₃-N ratio on Organic Removal and Itrofication using a modified rBC", *Bioprocess Engg.* Vol.16, No.2, p. 77-82, 1997.
20. Jayantha, K.S., and Ramanujam, T.K. "Biomethanation from wastewaters using an Upflow Anaerobic Sludge Blanket (UASB) Process", *Ind. J. of Env. Health*, Vol.38, No.3, p.171-180, 1996.
21. M.Chidambaram, "Periodic operation of isothermal reactors with input multiplicities, Chapter 19, in *Mixed flow hydrodynamics*, Adv. in Engg. Fluid mechanics Series, (ED). N.Chemisinoff, Gulf. Pub. Co. 43-155, 1996.
22. M.Chidambaram, "Concentration forcing of isothermal reactors for autocatalytic reactions, Chapter 19, In *Multiphase reactors and Polymerization system hydrodynamics*, Advances in Engg. Fluid Mechanics (Ed.) N.Chemisionoff, Gulf Pub. Co. 525-538, 1996.
23. M.Chidambaram & G.P.Reddy, "Nonlinear control of systems with input multiplicities", *Comp. & Chem. Engg.* 20, 295-299, 1996.
24. M.Kavdia & M.Chidambaram, "Online controller tuning for unstable systems", *Comp. & Chem. Engg.* 20, 301-305, 1996.
25. E.F.Jacob & M. Chidambaram, "Design of controllers for unstable first order plus time delay systems", *omp & Chem. Engg.* 20, 579-584, 1996.
26. M.B.Hrshikesh and M.Chidambaram, "Periodic operation of tubular reactors for autocatalytic reactors with input multiplicities", *Ind. J.Tech.* 3, 7-10, 1996.
27. R.Balachandran & M.Chidambaram, Comparisons of performances of decentralized controllers, *Proc. Contr. & Qualit.* 8, 123-131, 1996.
28. N.Srinivas & M.Chidambaram, Experimental comparisons of on-line identification methods for controller tuning, "Proc. Contr. & Qualit. 8, 85-89, 1996.
29. C.Shahji & M.Chidambaram, Robust decentralized PI controllers for crude product quality, *Proc. Contr. & Quali.* 8, 167-175, 1996.
30. N.Srinivas & M.Chidambaram, Comparison of online controller tuning of unstable systems, *Proc. Contr. & Quali.* 8, 177-183, 1996.
31. E.F.Jacob & M.Chidambaram, Robust control of unstable bioreactors, *Proc. Contr. & Qualit.* 8, 147-156, 1996.
32. K.V.Narayanan and M.S.Ananth, A modified model for the hermodynamic properties of single and mixed electrolytes, *Fluid Phase Equilibria*, 114, 89-121, 1996
33. C.Ananda Babu, K.B.lal, Jaleel Ahmed, S.K.Rakshit and M.S.Ananth, Modelling of submicron cross flow ceramic filter for copper ferrocyanide colloidal suspension, *Journal of Energy, Heat, and Mass Transfer*, 18, 275-279, 1996.
34. P.S.T.Sai, Recent Advances in the analysis and design of Rotary kilns, *Journal of Energy, Heat and Mass rTansfer*, 18, 91-98, 1996.

4.4 Chemistry Department

1 Introduction

The Department of Chemistry started functioning as an Independent Department in 1961, two years after the establishment of the Institute. In addition to offering instructions at the B.Tech and select M.Tech levels the Department offers 4 semester M.Sc. programme and Ph.D. programme. The major areas of teaching at post-graduate level are Inorganic Chemistry including Analytical Chemistry, Organic Chemistry including Biochemistry, Physical Chemistry and Theoretical Chemistry. The specialisations in Ph.D. programmes include:

Analytical Chemistry	Electrochemistry
Nuclear Chemistry	Photochemistry
Chemistry of Main Group Elements	Polymer Chemistry
Soild State Chemistry	Spectroscopy
Coordination and Bioinorganic	Chemistry Theoretical & Structural Chemistry
Biochemistry & Biotechnology	Synthetic Organic Chemistry
Homogeneous & Heterogeneous Catalysis	Bioorganic Chemistry

2. Academic Programmes:

2.2 Students on Roll (as on 30th Sept. 1996)

Programme	Years					Total
	I	II	III	IV	V	
M.Sc.	23	29				52
Ph.D.	22	13	18	24	17	94
Total	45	42	18	24	17	146

2.3 Number of Scholarship/ Fellowship holders (as on 30th Sept. 1996)

Programme	Institute Scholarship	Others	Total
Ph.D.	65	25	90
Total	65	25	90

2.4 Number of Degree Awarded in the last convocation

Programme	Number
M/Sc.	23
Ph.D.	22
Total	45

3. Faculty and their Development:

3.1 Faculty Name and Qualification

Major area of Specialisation

Professors

K.K. Balasubramanian, Ph.D. (Madras)	Synthetic & Mechanistic Organic Chemistry
N. Balasubramanian, Ph.D. (IITM)	Analytical & Environmental Chemistry
T.S. Chandra, Ph.D. (IISc, B'lore)	Biochemistry & Biotechnology
M.S. Gopinathan, Ph.D. (IITK)	Theoretical Chemistry, Molecular Spectroscopy, Nonlinear Dynamics & Chaos
K. Lalitha, Ph.D. (Mysore)	Biochemistry, Biotechnology
T.V. Ramakrishna, Ph.D. (Birmingham, UK)	Analytical & Environmental Chemistry
R. Ramaswamy, Ph.D. (IITM)	Electrochemistry, Oscillatory Reactions
M.R. Udupa, Ph.D. (IITMadras) [Head]	Coordination Chemistry, Solid State Chemistry
S. Vancheesan, Ph.D. (IITM)	Homogeneous Catalysis, Organometallics
C. S. Venkatachalam, Ph.D. (IITM)	Electrochemistry, Mechanism of Electrode Reactions
B. Viswanathan, Ph.D. (IITM)	Surface Science, Materials Science

Professors (Adjunct)

S. Subramanian, Ph.D. (Leicester)	Magnetic Resonance, Theoretical Chemistry
Surjit Singh, Ph.D. (IIT Kanpur)	Molecular Spectroscopy Theoretical Chemistry

Associate Professors

A.K. Misra, Ph.D. (IITK)	Photophysics, Photochemistry
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S. Sankararaman, Ph.D. (Victoria, Canada)	Synthetic and Physical Organic Chemistry, Organic Photochemistry
M.N. Sudheendra Rao, Ph.D. (IISc, B'lore)	Inorganic Heterocycles, Chemistry of Main Group Elements
G. Sundararajan, Ph.D. (Rutgers, USA)	Organometallics, Polymer Synthesis, Asymmetric Induction
T.K. Varadarajan, Ph.D. (IITM)	Heterogeneous Catalysis
U.V. Varadaraju, Ph.D. (IISc, B'lore) Joint. With MSRC	Solid State Chemistry, Materials Science
R.P. Viswanath, Ph.D. (IITM)	Heterogeneous Catalysis
Assistant Professors	
Archita Patnaik, Ph.D. (BHU, Varanasi)	Nuclear Spectroscopy, Ion Implantation
R. Dhamodharan, Ph.D. (Mass, USA)	Polymer Surface Structure and Properties, Polymer Adsorption
Indrapal Singh Aiden, Ph.D. (Pune)	Synthetic Organic Chemistry, Carbohydrate Chemistry
D. Loganathan, Ph.D. (IITB)	Synthetic Organic Chemistry, Carbohydrate Chemistry
K. Mangala Sunder, Ph.D. (McGill, Canada)	Theoretical Chemistry, Spectroscopy, Chemical Reaction Dynamics
T. Pradeep, Ph.D. (IISc, B'lore) Joint with RSIC	Chemical Physics, Spectroscopy
P. Raja Kumar, Ph.D. (Madras)	Synthetic Organic Chemistry
G. Ranga Rao, Ph.D. (IISc, B'lore)	Heterogeneous Catalysis, Surface Science
M.V. Sangaranarayanan, Ph.D. (IISc, B'lore)	Electrochemistry, Mathematical Modelling
M.S. Subramanian, Ph.D. (IITM)	Radioanalytical Chemistry
N. Sundaram, Ph.D. (IITM)	Organic Mass Spectrometry, Organic Synthesis, Reaction Mechanism
K. Vidyasagar, Ph.D. (IISc, B'lore)	Solid State Chemistry

Visiting Faculty

N. Narasimha Murthy, Ph.D. (IISc, B'lore) Bio-inorganic Chemistry

Emeritus Scientist (CSIR)

C. Kalidas Electrochemistry

D.V. Ramana Organic Chemistry

During the year under review the following faculty members retired after superannuation.

Dr. T.V. Ramakrishna

3.2 Short-Term Courses/Workshops/Seminars/Symposia/Conferences organised by the Department:

Sl. No.	Co-ordinator(s)	Title of Workshop/Seminar/Symposium/Conference	Period
1.	M.R. Udupa M.S. Gopinathan	National Seminar on Molecular Dynamics and Structure	April 5-6, 1996
2.	M.R. Udupa G. Sundararajan	Industrial Chemical & Instrumental Analysis	Apr. 15-20, 1996
3.	M.R. Udupa G. Sundararajan (In-House seminar, ChemQuiz '96)	Chemists' Meet '96	Dec. 12-14, 1996
4.	M.R. Udupa M.N.S. Rao	Metals ions in Biological Sciences	Mar. 21-23, 1997

3.3 Short-term Courses/Workshop/seminar/Symposia/Conferences/ Training attended by the Faculty in recognised Academic Institutions and Public Sector Units

Sl. No.	Name of Faculty	Title	Period/Duration
1.	K.K. Balasubramanian	Third Indo-German Seminar on Modern Aspects of Electrochemistry, I.I.Sc., Bangalore	26.9.96 to 1.10.96
		Emerging Trends in Organic Chemistry, RRL, Trivandrum	17,18, Nov. 1996

		National seminar on Frontier Areas In Organic Chemistry	4,5, Feb. 1997
2.	T.S. Chandra	INSA visiting fellowship to CCMB, Hyderabad	June, July, 1996
3.	M.S. Gopinathan	Discussion Meeting on Theoretical Chemistry	5-8, Dec. 1996
4.	K. Lalitha	65th Annual Meeting of Society of Biological Chemists (India) IISc., Bangalore	19-23, Nov., 1996
		DAAD Indo-German Symposium IICT, Hyderabad	27-28, Oct. 1996
		2nd International Symposium on Atherosclerosis, thrombosis and transfusion medicine Bangalore	19-21, Dec. 1996
5.	T.V. Ramakrishna	Analytical Techniques for Safety and Sufficiency of Natural Resources and Products, M.G.U., Kottayam	Feb. 20-22, 1997
		Pollution Control Technologies Significance of analysis and speciation, Andhra U.,	March 11,12, 1997
6.	B. Viswanathan	Seminar on Synthetic Fuels and Pollution Abatement Anna U., Madras.	Jan. 23-25, 1996
7.	S. Sankararaman	National Symposium on Emerging Trends in Organic Chemistry	Nov. 18,19. 96
8.	G. Sundararajan	International Seminar on High Energy Materials, HEMRL, Pune	Nov. 19-21, 1996
9.	R.P. Viswanath	INSA visiting Fellow at IISc, B'lore	Jan.-Mar., 1997
10.	Archita Patnaik	7th International Symposium on Radiation physics, Jaipur	Feb. 1997
		Symposium on Laser applications in Materials Science & Industry, IGCAR, Kalpakkam	Jan. 1997

		DAE Solid State Symposium Poona University, Pune	Nov. 1996
11.	M.V. Sangaranarayanan	Seminar on Vistas in Chemistry at Manonmaniyan Sundaranar University, Thirunelveli	March, 7,8, 1996
		3rd Indo-German Conference on Modern Aspects of Electro- chemistry	26.9.96 to 1.10.96
12.	D. Loganathan	XIth Carbohydrate Conference IICB, Calcutta	Nov. 21,22-1996
		24th Annual Meeting of the Indian Biophysical Society IISc, Bangalore	Dec. 9-12, 1996
13.	K. Vidyasagar	Responsive Inorganic Materials Royal Society-Unilever-Indo-UK Forum at IISc, Bangalore.	4-6, Dec. 1996

3.4 Special lectures delivered by the faculty in other Institutions:

Sl. No.	Name of faculty	Topic of Lecture	Venue & Date
1.	K.K. Balasubramanian	UGC Teacher's Refresher Programme,	U. Of Cochin 20,21, March 1997
		UGC Advanced Centre Assis- tance Programme	Andhra U., Vizag Nov. 21,22, 1996
2.	T.S. Chandra	Protoplast fusion in Industrial Fungi	June 1996
3.	M.S. Gopinathan	Molecular Orbital Theory	St. Joseph College Trichy, Jan. 24, '97
4.	R. Ramaswamy	Oscillatory Reactions	Pondicherry U. Nov. 4,5, 1996
5.	B. Viswanathan	Solar energy prospects for the future	Loyola College March 1996

6.	S. Sankararaman	Organic Photochemistry	RKM Vivekananda College, Madras, Sep. 27, 1996
		Organic Chemistry	Refresher's course for PG Teachers, Feb 22, 1997
7.	G. Sundararajan	Organic Chemistry	Refresher's course for PG Teachers, Feb 22, 1997
		Polymer Chemistry	IGCAR, Kalpakkam May 25, 1996.
		Metathesis Polymerisation	Central University, Hyderabad Sep. 14, 1996
		---do---	NCL, Pune Nov. 22, 1996
8.	G. Ranga Rao	Sm/Ru(001) Interface: An ESCA study.	IICT, Hyderabad June 14, 1996

3.5 Visits abroad by faculty

S.No.	Name of Faculty	Country visited	Date	Purpose of visit
1.	R. Ramaswamy	Bordeaux, France	July 15-18	Conference
2.	S. Vancheesan	Brisbane, Australia	July 7-12	Conference
3.	B. Viswanathan	Indianapolis, USA	Apr. 14-20	American Ceramic Society Meeting
4.	S. Sankararaman	Braunschweig, Germany	May 15-Aug. 15	INSA-DFG Exchange Fellowship
5.	G. Sundararajan	Brisbane, Australia	July 7-12	Conference
6.	R.P. Viswanath	Baltimore, USA	July 1996	Conference
7.	Archita Patnaik	Institute of Modern Physics, China	Aug.-Dec., '96	TWAS Associateship

8. M.S. Subramanian Chicago, USA Mar. 3-8, 1996 Conference

3.6 Honours and Awards

Sl. No.	Name of Faculty	Honours/Awards	Purpose
1.	T.V. Ramakrishnan	Athavale Endowment award	Research in Analytical Chemistry
2.	B. Viswanathan	Editor, Applied Catalysis	Contributions in the field of Catalysis
3.	A.K. Mishra	Prof. R.C. Tripathy Memorial Young Chemist award for 1997 by Orissa Chemical Society	For contributions in chemical sciences
4.	D.V. Rana	Gold Medal from Indian Society for Mass Spectrometry	Meritorious contribution in the field of mass spectrometry

3.7 Books/Monographs Published

Sl. No.	Name of Faculty	Title	Publisher
1.	K. Mangal Sunder	Theoretical-Rotational-Vibrational Spectroscopy in Frontiers in Physical Chemistry, ed. T. Pradeep, Allied Publishers, New Delhi, 1996.	

3.10 Memberships/Fellowships in Professional Bodies

1.	K.K. Balasubramanian	Fellow of the Indian National Science Academy Fellow of the Indian Academy of Sciences
2.	T.S. Chandra	Life Member of the Indian Society for Technical Education President of the Association of Microbiology - India Member, American Society for Microbiologists
3.	M.S. Gopalan	Fellow of the Indian National Science Academy Fellow of the Indian Academy of Sciences
4.	R. Ramaswamy	Life Fellow for the Society for Advancement of Electrochemical Science & Technology

- | | | |
|-----|-------------------|--|
| 5. | M.R. Udupa | Fellow of Indian Chemical Society
Fellow of Indian Thermal Analysis Society
Catalysis Society of India
Life Fellow for the Society for Advancement of
Electrochemical Science & Technology |
| 6. | S. Vancheesan | Member of New York Academy of Sciences |
| 7. | B. Viswanathan | Fellow of the International Association of hydrogen
energy |
| 8. | G. Sundararajan | Member of the American Chemical Society |
| 9. | R.P. Viswanath | Life member of Materials Research Society of India |
| 10. | Archita Patnaik | Associate Member of the IUPAC
Life member of Alexander Von-Humboldt
Foundation |
| 11. | D. Loganathan | Executive member, Association of Carbohydrate
Chemists & Technologists (India)
Member Forum, Carbohydrates Coming og Age,
Japan |
| 12. | K. Mangala Sunder | Member of the American Physical Society |
| 13. | G. Ranga Rao | Life Membership of Catalysis Society of India |

4. Design and Development Activities:

4.1 Brief and specific details of Process/Instalment/Equipment/Software Designed and Developed

- | | | |
|----|-----------------|---|
| 1. | M.S. Gopinathan | A software package for non-linear dynamical
systems developed under CCE of IIT, Madras
marketed as NONLIN-1.0 |
|----|-----------------|---|

4.2 New Facilities added and Major Equipment procured

1. Glucose analyset for fermentation broths
2. UV-Visible dual beam spectrometer with Vision software
3. GC-Integrator
4. A computational laboratory with Internet connectivity
5. State-of-the-art Liquid Chromatography system for polymer molecular weight analysis and for chiral analysis

6. Positron life-time spectrometer for nuclear timing spectroscopy

7. Freeze Dryer

5. Research and Consultancy

5.1 Sponsored Projects on hand (only ongoing)

Sl. No.	Title	Period	Funding Agency	Amount in lakhs	Co-ordinator(s)
1.	New Approaches to C-aryl glycosides	1995-98	CSIR	3.0	K.K. Balsubramanian
2.	New Routes to C-aryl glycosides	1995-98	DST	6.8	K.K. Balsubramanian
3.	Mechanisms of reactions of aromatic hydrocarbons and 3,3-sigmatropic systems derived from phenolic compounds under thermal and flash pyrolytic conditions	1992-97	Indo-US	18.0	K.K. Balsubramanian
4.	Anaerobic recycling of lignocellulosic wastes for fuels and feed-stock chemicals	1992-96	ICAR	9.98	T.S. Chandra
5.	Production of Vitamin B complex enriched animal feed supplement	1994-97	DBT	3.9	M.S. Ananth & T.S. Chandra
6.	Application of metal carbonyls and their derivatives as catalysts for hydrogenation under PTC.	1996-99	DST	8.0	S. Vancheesan
7.	Structure activity relationship in zeolites, heteropoly compounds and related structures by solid state NMR spectroscopy	1996-99	DST	6.0	B. Viswanathan
8.	Quantum chemical model related compounds	1996-99	CSIR	3.0	B. Viswanathan
9.	Dynamic fluorescence quenching of heteroaromatic fluorophore quencher systems in solution	1994-97	DST	3.6	A.K. Mishra
10.	Development of Fluorescence based Fibre-Optic sensors	1996-99	DAE	7.7	A.K. Mishra

- | | | | | | |
|-----|--|-----------|-------------|------|-----------------------|
| 11. | Development of fluorescence based analytical techniques with polynuclear aromatic hydrocarbon fluorophores | 1997-2000 | CSIR | 5.0 | A.K. Mishra |
| 12. | Stereo-selective substitution of acetals in 5M Lithium Perchlorate Diethyl ether medium | 1996-99 | CSIR | 5.0 | S. Sankararaman |
| 13. | Novel phosphine oxides and their nitrogen analogs | 1997-2000 | DAE | 5.36 | M.N.S. Rao |
| 14. | Synthesis of novel polymers and small organic molecules by soluble and tunable olefin metathesis catalysts | 1995-1998 | DST 22.24 | | G. Sundararajan |
| 15. | Application of nuclear Instrumental techniques to microscopy | 1995-98 | IUC-DAEF | 2.2 | Archita Patnaik |
| 16. | Chemical modification of fullerenes by recoil implantation | 1995-98 | IUC-DAEF | 1.8 | Archita Patnaik |
| 17. | Positrons as probe for structure-property correlations in polymers | 1997-2000 | DST | 17.1 | Archita Patnaik |
| 18. | Alternative routes to C-aryl glycosides | 1996-99 | CSIR | 6.0 | Indrapal Singh Aiden |
| 19. | Glycoside catalysed oligo-saccharide synthesis | 1995-98 | DST | 10.1 | D. Loganathan |
| 20. | Investigations on transition metal catalysts supported Ceria-based oxide materials | 1996-98 | IRDF (IITM) | 0.5 | G. Ranga Rao |
| 20. | Modelling electrocatalysis at chemically modified electrodes | 1994-97 | DST | 4.1 | M.V. Sangaranarayanan |
| 21. | Novel low temperature methods to synthesise new metastable and known complex metal oxides | 1995-98 | DST | 4.1 | K. Vidyasagar |
| 22. | Novel low temperature synthesis & structures of new poly chalcogenide compounds | 1995-98 | CSIR | 6.5 | K. Vidyasagar |

23.	Mass spectrometer as a probe in the syntehsis of heterocyclic compounds	1996-99	CSIR	5.8	D.V. Raman
24.	Thermodynamics and electro-chemical aspects of metal - cryptands complexes in mixed solvent	1996-99	CSIR	4.0	C. Kalidas

5.2 Industrial Consultancy (only on-going)

Sl. No.	Title	Industry	Value in Thousand	Co-ordinator(s)
1.	Modification of existing chamber for H ₂ S	Electronics Test & Development Centre	10	N. Balsubramanian
2.	Conversion H ₂ S Test set up to include SO ₂ gas	---do---	5	N. Balasubramanian
3.	Analysis of flux	TI Cycles, Madars	10	B. Viswanathan & N. Balasubramanian

5.3 RBIC (only on-going)

S. No.	Name of the Investigator/ Co-investigator	Number	Values (in lakhs)
1.	K.K. Balsubramanian	RB9697CHY001SCADKKBA	0.75
2.	K.K. Balsubramanian	RB9596CHY004MCPKBA	2.01
3.	T.S. Chandra	RB9596CHY005CLILTSCH	0.60

5.4 Retainer Consultancy (only on-going)

S. No.	Name of faculty	Title	Industry
1.	K.K. Balsubramanian		Anjan Drugs
2.	K.K. Balsubramanian		Shasun Chemicals & Drugs

5.5 Research Publications

(a) Journals (published papers only) International

1. Palani, T. Rajamannar & K.K. Balsubramanian, "Acid catalysed fragmentation of 7,7-dimethoxy norborneols - A rapid entry to 5 substituted 2-cycopentanones", Syn. Lett., 572-3, (1997)

2. Shanthi & N. Balasubramanian, "A simple spectrophotometric determination of hydrogen sulphide - based on Schiff reaction", *Micro. Chem J.*, 53, 168-74 (1996)
3. Padmaja, N. Balasubramanian & T.V. Ramakrishna, " Determination of sub-microgram amount of inorganic and organo mercuric compounds by absorption spectrophotometry", *Intl. J. Environ. Anal. Chemistry*, 63, 47-59, (1996)
4. Shanthi & N. Balasubramanian, "A sensitive spectrophotometric determination of hydrogen sulphide", *Analyst*, 121, 647-50, (1996)
5. Pandurangappa & N. Balasubramanian, "Extractive spectrophotometric determination of trace amounts of nitrogen dioxide, nitrite and nitrate", *Mikrochim. Acta*, 124, 137-46, (1996)
6. Maheswari & N. Balasubramanian, " Indirect spectrophotometric determination of chromium", *J. AOAC (Intl)*, 79, 4, 989-94 (1996)
7. Maheswari & N. Balasubramanian, "Spectrophotometric determination of chromium based on ion-pair formation", *Chem. Anal.*, 41, 569-76, (1996)
8. Pandurangappa & N. Balasubramanian, "Cationic surfactants as a sensitizer for the spectrophotometric determination of sulphur dioxide in air", *Analysis*, 24, 225-29, 1996)
9. Srividya & N. Balasubramanian, "Indirect spectrophotometric determination of ascorbic acid in pharmaceutical samples and fruit juices", *Analyst*, 121, 1653-1655, (1996)
10. Usha Antony, G. Sripriya & T.S. Chandra, "The effect of fermentation on the primary nutrients in foxtail millets *Setaria italica*", *Food Chemistry (UK)* 56, (1996)
11. Usha Antony, G. Sripriya & T.S. Chandra, "Effect of fermentation on the primary nutrients in finger millet (*Eleusine coracana*)", *J. Agri. Food Chemistry, Amer. Chemical Society*, 44, 2616-2618 (1996)
12. Usha Antony, G. Sripriya & T.S. Chandra, "Changes in carbohydrates, free amino acids, organic acids, phytate and HVI extractability of minerals during germination and fermentation of finger millets", *Food Chemistry (UK)*, 58, 345-350 (1996).
13. Sripriya, K. Chandra Sekaran, V.S. Murthy & T.S. Chandra, "ESR spectroscopic studies on free radical quenching action on finger millets", *Food Chemistry (UK)*, 57, 537-540, (1996)
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27. Das, S. Dhara & A. Patnaik, "Amorphization of spin coated thin film of poly(2,6-dimethyl-4-phenylene oxide)", Proc. of the DAE Solid State Symposium, 39C 1996.
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35. Mangal Sunder, "Theoretical Molecular Spectroscopy", Chemists Meet 96, Dec. IIT, Madras, 12-14, 1996
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37. Murthy, "¹H-NMR spectroscopy and electronic properties of paramagnetic copper (II) complexes: relevance to copper-proteins", National seminar in Metal ions in Biological Sciences, March 21-23, 1997.
38. Murthy, "Hydrolysis of an amide promoted by Cu(II): a model for metallo-peptidase", National seminar in Metal ions in Biological Sciences, March 21-23, 1997.

6. Distinguished Visitors to the Department

Sl. No.	Name of the Visitor and designation	Date of the Visit	Purpose of visit (Lecture/Discussion)
1.	Dr. S.K. Athithan, ISRO, Sri Harikotta	Aug. 22, 1996	Discussion
2.	Dr. T.P. Radhakrishnan, Central University, Hyderabad	Sep. 12, 1996	Discussion
3.	Prof. M. Periasamy, Central University, Hyderabad	Sep. 20, 1996	Lecture
4.	Prof. M.P. Schneider, Bergische U. Wuppertal, U.S.A.	Oct. 1, 1996	
5.	Dr. Ashok Dhingra, DuPont, U.S.A.	Oct. 10, 1996	Discussion
6.	Dr. Vijay Nair, RRL, Trivandrum	Oct. 11, 1996	Lecture
7.	Dr. G.K. Surya Prakash, Locker Hydro-carbon Research Institute, University of Southern California, USA	Nov. 19, 1996	Discussion
8.	Dr. Sigmund Csisary, USA	Nov. 19-21, 1996	Lecture & Discussion
9.	Dr. D.A. King, Cambridge U. K	Nov. 25, 1996	Lecture
10.	Dr. Henry F. Schaeffer III, Centre for Computational Quantum Chemistry, USA	Dec. 6, 1996	Lecture
11.	Dr P.K. Ghosh, Director, DBT	Dec. 96	Discussion

12.	Dr. Albert Leval, Lagon Kissath University, Hungary	Jan. 13, 1997	Discussion
13.	Dr. Murti Tanikella, DuPont, USA	Jan. 13, 1997	Lecture
14.	Dr. R. Clarke, University College London	Jan. 24, 1997	Lecture & Discussion
15.	Dr. Israel Agranat, Hebrew University of Jerusalem, Israel	Jan. 27, 1997	Lecture
16.	Dr. Pierre Avenas, Elf Atochem, France	Feb.8, 1997	Discussion
17.	Prof. Michel Fontanille, France	Feb 14, 1997	Lecture
18.	Prof. J. Gopalakrishnan, IISc.	Feb 14, 1997	Lecture
19.	Dr. H. Karge, FHI, Berlin	Feb. 97	Lecture
20.	Dr. Figueres, IRC, France	Feb. 28- Mar. 2	Lecture
21.	Dr. Brian Sanctuary, McGill U. Canada	Mar. 12-Apr.12	Lecture & Discussion

4.5. Civil Engineering Department

4.5.1 Introduction

The Department of Civil Engineering was established in the year 1959. The educational objective of the Civil Engineering Department has been to train the students with emphasis on understanding the fundamental behaviour and design of civil engineering components and systems. The students thus trained could meet the challenging demands, and become leaders to give appropriate direction to the civil engineering profession.

The degree programmes in the Department include education at the undergraduate and graduate levels. The undergraduate Civil Engineering curriculum is broad based, making a wide choice of careers possible. The course based graduate M.Tech. degree programme, on the other hand, offers specialisation in the six major areas of Civil engineering namely, Building Technology and Construction Management, Environmental Engineering, Geotechnical Engineering, Hydraulic and Water Resources Engineering, Structural Engineering and Transportation Engineering. M.Tech. degree programmes prepare the students to meet the advanced technology requirements of the industry. M.S. degree programmes give an exposure to the process of research, whereas the Ph.D degree programmes give training for original research on advanced topics in the six areas of specialisation and prepare the scholars for careers in the academic as well as research and development sectors.

Members of the faculty interact extensively with industries in both public and private sectors. The Department has been leading, in the earnings through industrial consultancy projects at the institute level. There is also growing emphasis on sponsored research projects and the faculty members are actively involved in several research projects funded under international collaboration schemes and by national agencies.

4.5.2 New Courses Introduced

The following new courses were introduced in the current year.

S.No.	Course No.	Title
1.	CE 634	Finite Element Methods in Water Resources
2.	CE 639	Environmental Hydraulics
3.	CE 780	Environmental Microbiology and Engineering Laboratory

4.5.3 Details of Faculty

Professors

H. Achyutha, Ph.D (IIT Madras)
P.K. Aravindan, Ph.D.(IIT Madras)
K. Elango, Ph.D (IIT Madras) [Head]

Specialisation

Structural Engineering
Structural Engineering
Hydraulic & Water Resources Engg.

V. Kalyanaraman, Ph.D (Cornell)	Structural Engineering
C.S. Krishnamoorthy, Ph.D. (London)	Structural Engineering
N.R. Krishnaswamy, Ph.D.(IIT Kanpur)	Geotechnical Engineering
M.S. Mathews, Ph.D (IIT Madras)	Building Tech.& Constrn. Management
Nalnan P. Kurian, Ph.D (IIT Madras)	Geotechnical Engineering
N. Rajagopalan, Dr.-Ing (Stuttgart)	Structural Engineering
H. Raman, Ph.D (IIT Madras)	Hydraulic & Water Resources Engg
V.R. Rengaraju, Ph.D (IISc Bangalore)	Transportation Engineering
P. Srinivasa Rao, Dr. -Ing (Muenchen)	Structural Engineering
H. Suresh Rao, Ph.D (IIT Madras)	Hydraulic & Water Resources Engg
B.S. Thandaveswara, Ph.D (IISc Bangalore)	Hydraulic & Water Resources Engg

Visiting Professor

R. Pitchai, Ph.D (Harvard)	Environmental Engineering
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Associate Professors

R. Ambalavanan, Ph.D (IIT Madras)	Building Tech.& Constrn. Management
A. Boominathan, Ph.D (USSR)	Geotechnical Engineering
S.R. Gandhi, Ph.D (IIT Madras)	Geotechnical Engineering
S. Mohan, Ph.D (IISc Bangalore)	Hydraulic & Water Resources Engg
S.B. Pattnaik, Ph.D (IIT Kanpur)	Transportation Engineering
K. Rajagopal, Ph.D (Florida)	Geotechnical Engineering
A. Ramachandralah, Ph.D (IIT Madras)	Building Tech.& Constrn. Management
K. Srinivasan, Ph.D (IIT Madras)	Hydraulic & Water Resources Engg.
V. Thamizh Arasan, Ph.D (IIT Madras)	Transportation Engineering

Assistant Professors

K. Gopalakrishna, M.Tech (IIT Kanpur)	Environmental Engineering
S. Gopalakrishnan, Ph.D (Purdue Univ)	Structural Engineering
Koshy Varghese, Ph.D. (Texas Austin)	Building Tech. & Constrn. Management
N. Kumar Pitchumani, Ph.D (IIT Kanpur)	Geotechnical Engineering
A. Meher Prasad, Ph.D. (Rice Houston)	Structural Engineering
K. Ramamurthy, Ph. (IIT Madras)	Building Tech.& Constrn. Management
K.N.Satyanarayana, Ph.D (Clemson)	Building Tech.& Constrn. Management

Lecturers

Alok Madan, Ph. (SUNY Buffalo)	Structural Engineering
K. Ananthanarayanan, Ph.D (IIT Madras)	Building Tech.& Constrn. Management

Senior Scientific Officers

M. Subbi Reddy, M.S. (IIT Madras)

Transportation Engineering

K.D. Chandrasekaran, Ph.D (IIT Madras)

Environmental Engineering

Technical Officers

P.R. Kothandaraman (SG)

K. Bhaskaran

4.5.4 Students On Roll

Programme	I Year	II Year	III Year	IV Year	V Year	Total
B.Tech.	40	42	45	42	-	169
M.Tech.	42	38	-	-	-	80
M.S.	11	3	2	11	-	27
Ph.D	5	7	7	6	20	45
Total	98	90	54	59	20	321

4.5.5 Number of Scholarships/Fellowships

Programme	Institute Scholarship	QIP	Others	Total
Ph.D	13	6	1	20
M.S.	14	-	6	20
M.Tech.	28	2	-	30
Total	55	8	7	70

4.5.6 Number of Degrees Awarded

Programme	No. Awarded
Ph.D.	11
M.S.	9
M.Tech.	42
B.Tech.	39
Total	101

4.5.7 Instruments/Equipment Designed and Developed

Dr. K. Ramamurthy:

A Test Setup for estimation of consistency of masonry mortar.

Dr. K. Rajagopal:

Interactive software program WINKLER for soil-structure interaction analysis and design of combined footings based on winkler spring analysis.

Interactive software SLOPE for the slope stability analysis using Bishop and ordinary method of slices.

General purpose finite element analysis program GEOFEM for analysis of geotechnical engineering problems.

Dr. H. Raman:

An Expert system software for reservoir operations.

Dr. K. Srinivasan:

Flood routing in reservoirs and chanel

Flood frequency analysis

Selection of reservoir hedging policy

4.5.8 New Facilities and Major Equipment Procured

Building Technology & Construction Management

Electronic Distance Meter, M/s. Leica AG Switzerland (Wild Co.)

Electronic Total Station, M/s. Leica AG Switzerland (Wild Co.)

Electronic Theodolite, M/s. Sokkia, Japan

Automatic Level, M/s. Sokkia, Japan

GIS Project

- 1 Pentium computer

- 2 486 computers

- 1 A1 size Inkjet plotter

- ARC/GIS software - 10 copies PC version

- 2 copies workstation version

- Computer Integrated Construction environment

- Jspace - from Jacobus Technology

Geotechnical Engineering Division

Universal testing machine for tension testing of geosynthetic reinforcement materials

Transducers for measuring soil pressures, strain gauge meters and associated computer controlled data acquisition systems and software

Dynamic soil testing equipment consisting of exciters, speed control units, and a Digital storage oscilloscope with a plotter

Vibrating wire Piezometers (3 nos) and read out unit

Carrier frequency amplifier

Hydraulic & Water Resources Engineering

Pentium PC and peripherals

HP Scan Jet 690 DPI - Scanner

HP Laser Jet 690 DPI - Plotter

Structural Engineering Laboratory

Compaque Pentium Notebook Computer (LT5150)

10T EOT crane for Structural Dynamics Laboratory

Centre for Finite Element Analysis and Design

Five Silicon Graphics Indy R5000 Work Stations

Three Pentium Systems

ANSYS, ABAQUS, NISA, MSC NASTRAN Software packages

4.5.9 Sponsored Projects

S.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Coordinator(s)
1.	Geosynthetic reinforced earth embankments	1995-1998	DST	9.77	Dr. N.R. Krishnaswamy Dr. K. Rajagopal Dr. S.R. Gandhi Dr. A. Boominathan
2.	Geocell reinforcement for soft soil subgrades	1997-1998	Netlon India Vadodara	6.20	Dr. K. Rajagopal Dr. N.R. Krishnaswamy
3.	Modernisation of geotech. Engg. Laboratory	1995-1997	AICTE	-	Dr. A. Boominathan Dr. K. Rajagopal
4.	Densification of flyash deposit	1995-1997	DST	22.00	Dr. S.R. Gandhi Dr. A. Boominathan
5.	Effectiveness of percolation ponds	1993-1996	DST	4.08	Dr. K. Elango Dr S. Mohan
6.	A study on salinity movement in creeks	1993- Dec.96	NIOT/ DOD	5.70	Dr. H. Suresh Rao Dr.B.S.Thandaveswara
7.	Software development for management analysis and watershed	1996-1998	DST	3.97	Dr. S. Mohan Dr. H. Raman
8.	Standardization of damage frequency relationships for flood damage assessment	1995-1997	DST	5.04	Dr. K. Srinivasan Dr. B.S. Thandaveswara
9.	Reservoir performance analysis using stochastic streamflow models	1996-1997	INCOH Ministry of Water Resources	6.30	Dr. K. Srinivasan Dr. B.S. Thandaveswara
10.	Instability and non-linear and panels behaviour of CFC elements	1993-1997	R & DB	5.21	Dr. V. Kalyanaraman
11.	Centre for Finite Element Analysis and Design	1996-	12 industries	33.00	Dr.C.S. Krishnamoorthy

4.5.10 Major Consultancy Assignments

S.No.	Title	Organisation	Amount (Rs. in Lakhs)	Coordinator(s)
1.	Foundation recommendations for 100 flats at Mogappair East	TNHB Special Division	1.44	Dr. K. Rajagopal Dr. N.R. Krishnaswamy Dr. Nainan P. Kurian
2.	Foundation recommendations for 48 HIG flats at Mogappair East	- do -	0.96	Dr. K. Rajagopal Dr. N.R. Krishnaswamy Dr. Nainan P. Kurian
3.	Foundation recommendations for 1163 HIG flats at Mogappair ERI Scheme	- do -	1.44	Dr. K. Rajagopal Dr. N.R. Krishnaswamy
4.	Recommendations for the construction of integrated Cargo complex at Madras Airport	Airports Authority of India	-	Dr. N.R. Krishnaswamy Dr. K. Rajagopal Dr. N. Kumar Pitchumani
5.	Recommendations for the construction of NEPC Hangar at Madras Airport	- do -	2.90	Dr. K. Rajagopal Dr. N.R. Krishnaswamy
6.	Bharat Petroleum tank foundation	BPCL	4.0	Dr. S.R. Gandhi Dr. Sundaravadivelu
7.	Foundation of for Gas power plant Kayankulam	DHELMIM Kerala	2.5	Dr. S.R. Gandhi
8.	Earth dam at CARI	Andaman	4.0	Dr. S.R. Gandhi Dr. K. Elango
10.	Soil investigation for construction of Ney Bay 33 for Boeing 747 at Madras Airport	Airport Authority of India	0.50	Dr. A. Boominathan Dr. N. Kumar Pitchumani
11. n	Geotechnical investigation at Tambaram Air Force Station	Airforce Station Tambaram	0.60	Dr. A. Boominathan Dr. N. Kumar Pitchumani

S.No.	Title	Organisation	Amount (Rs. in Lakhs)	Coordinator(s)
12.	Sump model test for VT pumps	Kirlosker Brothers Pune	24.00	Dr. B.S. Thandaveswara Dr. H. Suresh Rao
13.	Water quality test hydrographic survey of B.Canal/RO projects etc.	Madras Fertilizers	2.48	Dr. B.S. Thandaveswara Dr. H. Suresh Rao Dr. K.D. Chandasekaran
14.	Sleeved column system (Phase III)	- do -	3.00	Dr. V. Kalyanaraman
15.	Study of the performance of sleeved column systems under impact and cyclic loads	Tube Products of India	1.50	Dr. V. Kalyanaraman
16.	Application of sleeved column system in earthquake resistant building system	- do -	3.50	Dr.V. Kalyanaraman Dr. S. Gopalakrishnan
17.	Design of 80m microwave towers using cold roll formed steel sections	NSL Limited	0.60	Dr. V. Kalyanaraman
18.	Design of doppler weather radarAntenna structural system	AR & DB	1.75	Dr. V. Kalyanaraman Dr. A. Meher Prasad
19.	Assessment on recharge potential in Neyveli Aquifer system	NLC Neyveli	2.50	Dr. S. Mohan Dr. H. Raman
20.	Analysis of puumping tests data and artificial recharging by injectction well technique	NLC Neyveli	1.0	Dr. H. Raman Dr. S. Mohan
21.	Investigation on shrink Komp-30 Grout	ACC Limited	1.08	Dr. H. Achyutha
22.	Calibration of 1 million pound load cells	ACC Limited	0.50	Dr. H. Achyutha

4.5.11 Honours And Awards

Dr. H. Raman

Nominated by the Government of Tamil Nadu as a Member of the Tamil Nadu State Working Group to study water assessment methodology and to make recommendation in the Indian National Committee on Ground Water Assessment Methodology

Dr. R. Pitchai

Elected Vice President of AWARE (Association for waste management Remediation of Environment) in IGCAR, Kalpakkam.

Dr. V. Thamizh Arasan

Elected as the Honorary Secretary of the Chartered Institute of Transport in India, Southern India Section with Head Quarters at London, UK.

4.5.12 Distinguished Visitors To The Department

S.No.	Name Designation & Address	Purpose
1.	Prof. K.Purush K.Terkonda Professor of Environmental Engg. Univ. of Missouri Rolla USA,	Delivered a Lecture (7.8.1996)
2.	Sri P.J. Joseph Hon'ble Minister Minister for Edn. and Housing, Govt. of Kerala and Sri K. Ananda Bose, IAS Director Nirmithi Kendra	To study the technologies developed our Department (12.08.96)
3.	Dr. Chandra R. Bhat Asst Professor, Dept.of Civil Engg. Univ. of Massachusetts, Amherst	Delivered a Lecture (13.1.97)
4.	Prof.Wolfgang F.Gelger Germany	Visited laboratory facilities (01.02.1997)
5.	Dr.Pierre Avenas Vice President (World-wide R&D) Elf Atochem	Visited laboratory facilities (01.02.1997)
6.	Team of Deans Univ. Technology, Australia	With a view to develop and (13.2.1997) consolidate educational links between their Univ and higher educational institutions in India
7.	Prof. N. Hasebe Nayoga Institute of Technology, Nagoya, Japan	Delivered Lectures (5.3.1997)
8.	Prof. Fumio Tatsuoka Professor in Geotechnical Engineering, Univ. of Tokyo, Japan	Seminar
9.	Prof. M.R. Madhav Professor in Geotechnical Engineering, IIT, Kanpur	Seminar
10.	Dr. Nigel Walmsky Sr.Engineer Overseas Devpt. Unit, HR	Looked through the Laboratory

S.No.	Name Designation & Address	Purpose
	Wallingford facilities UK	
11.	Dr. M. Wermuth Head Institut für Verkehr und Stadtbauwesen, Braunschweig Germany	To work on a collaborative research (1.2.97-14.2.97)
12.	Dr. James M Kelly Professor of Civil Engg Univ. of California, Berkeley, California	Delivered Keynote address in the Seminar on Use of Natural Rubber-based bearings for Earthquake Protection of Buildings
13.	Dr. Christopher J. Derham Director, Materials Engg Natural Rubber Based Research Laboratory, Hertford, UK	Bearing for Earthquake Protection of Buildings
14.	Prof. S.K. Thakkar Head, Dept of Earthquake Engg., Univ. of Roorkee	Natural Rubber Based Bearing for Earthquake Roorkee Protection of Buildings
15.	Dr. Gangan Pratap NAL, Bangalore	Delivered Keynote address in the Symposium on "Finite Element Technology
16.	Prof. S. Kesavan Matscience, Madras	- do -
17.	Dr. N.V. Ramana Rao JNTU, Hyderabad	- do -
18.	Dr. M.K Harikumar EMRC, Bangalore	- do -
19.	Prof. B. Dattaguru IISc., Bangalore	- do -

4.5.13 Visits of Faculty Members to Other Institutions

S.No	Faculty Name	Institution visited	Purpose
1.	Dr. Koshy Varghese	University of Texas at Austin	As a Research Fellow to carry out research in Computer Integrated Construction.
2.	Dr. Koshy Varghese	Jacobus Technology Maryland	For signing an agreement for obtaining the software Jspace
3.	Dr. R. Pitchai	Anna University Madras	Special Lecture
4.	Dr. R. Pitchai	Tamil Nadu Pollution Control Board, Madras	Special Lecture
5.	Dr. R. Pitchai	CPR Environment Education Centre	Special Lecture
6.	Dr. R. Pitchai	National Institute of Occupational Health (ICMR) Ahmedabad	Member - Scientific Advisory Committee
7.	Dr. R. Pitchai	INAE, New Delhi	Fellow, Council Meeting
8.	Dr. H. Raman	Irrigation Management Institute	Lecture for 3 days

S.No	Faculty Name	Institution visited	Purpose
9.	Dr. S. Mohan	Anna Institute of Management, Chennai	To deliver a special lecture and to organise a brainstorming session on Droughts
10.	Dr. S. Mohan	Bapuji Institute of Technology	To deliver an expert lecture on "Fuzzy and its applications" 14-15 Dec. 1996
11.	Dr. V. Kalyanaraman	Railway Engineering College, Pune	To deliver a lecture
12.	Dr. S.B. Pattnaik	Braunschweig Univ., Germany	One day discussion with Prof. Wermuth
13.	Dr. V. Thamizh Arasan	Institut für Verkehr und Stadtbauwesen, Tech. Universität Braunschweig, Germany	To work on a sponsored research project

4.5.14 Seminars / Symposia / Conferences / Short Term Courses / Workshops Organised

S.No.	Faculty	Course Title	Date
1.	Dr.K.Ananthanarayanan Dr. Koshy Varghese & Dr. K.N. Satyanarayana	Three-day course on "State-of-Art Methods for Project Planning & Control"	24 - 26 October 1996
2.	Dr.M.S.Mathews	Course on "Research Methodology" for research scholars and M.Tech students of the Dept. of Civil Engg., IIT., Madras	9.5.96 & 14.5.96
3.		CEP Course on "Advanced topics in Construction Materials and Management" has been organised for Engineers from Kerala Nirmithi Kendra,	20 & 24 May 1996
4.		AICTE sponsored STTP and CEP course on "Construction Materials testing: Theory and Practice"	24.6.96 and 5.7.96
5.	Dr. K. Rajagopal and Dr. N.R. Krishnaswamy	STC on "Geosynthetic Reinforced Soil Structure" for practising engineers	Jan.23-25 1997
6.	Dr. C. S. Krishnamoorthy - Chairman, Dr. A. Meher Prasad - Co-ordinator and Dr. H. Achyutha - Co-ordinator.	Symposium on "Finite Element Technology in Indian Industry"	June 26-27, 1996

S.No.	Faculty	Course Title	Date
7.	Dr. C.S. Krishnamoorthy-Chairman, Dr. A. Meher Prasad - Co-ordinator and Dr. S. Gopalakrishna Co-ordinator.	Unido supported Seminar on "Use of Natural Rubber - based Bearings for Earthquake Protection of Buildings" at IIT, Madras	Aug. 27, 1997
8.	Dr. K. Rajagopal as one of the Organising Secretaries	Indian Geotechnical Conference 96 Anna University	Dec. 11-14 1996
9.	Chairman Dr. K. Elango, Co-Chairman Dr. P.K. Aravindan, Organising Secretary - Dr. V. Kalyanaraman	Structural Engineering Convention 1997 at IIT Madras,	February 12-14 1997

4.5.15 Participation in Seminars/Conferences/Symposia

S.No.	Name of Faculty	Conference/ Seminar	Dates	Nature of participation
1.	Dr. A. Ramachandraiah	MIRC IIT, Madras	-	Presented a paper
2.	Dr. K. Rajagopal	Indian Geotechnical Conference	12-14 Dec.96	Delegate
3.	Dr. K. Rajagopal	Indo-US workshop on Ground improvement using geosynthetics CRRRI New Delhi	26-28 Mar.97	Invited delegate
4.	Dr. S.R. Gandhi	Indian Geotechnical Conference	12-14 Dec.96	Paper presentation
5.	Dr. A. Boominathan	Indian Geotechnical Conference	12-14 Dec.96	Chaired a Session
6.	Dr. N. KumarPitchumani	Indian Geotechnical Conference	12-14 Dec.96	Delegate
7.	Dr. H. Raman	AI Engg. 1996 Florida, USA	10-14 Sep.96	Paper presentation
8.	Dr. H. Suresh Rao	Intl. Conf. on Ocean Engg.	17-20 Dec.96	Paper presentation
9.	Dr. H. Suresh Rao	Ntl. Conf. on Hydraulics	11-13 Dec.96	Paper presentation and Chaired a session
10.	Dr. S. Mohan	Intl. Conf. on Natural Disaster and Mitigation	19-22 Jan.96	Co-Chairman for a session & presented a paper
11.	Dr. S. Mohan	Intl. Conf. on reservoir sedimentation	9-13 Sep.96	Delegate & presented a paper

S.No.	Name of Faculty	Conference/ Seminar	Dates	Nature of participation
12.	Dr. K. Srinivasan	North American Water & Environ Congress (NAWEC)	22-28 June 1996	Presented 3 Technical papers
13.	Dr. R. Pitchai	Intl. Conf. on Disaster Mitigation Anna University	19-22 Jan. '96	Chaired Tech Session on Environmental degradation
14.		NPC Short Course on Environmental Audit	20-25 May 96	Inaugurated the Short Course
15.		Workshop on Rural Water supply in Tamil Nadu	13.6.96	Invited delegate
16.		Symp.on Intellectual Property Rights, IIT Madras	15.10.96	Participant
17.		Symp. on Pollution Human health, sustainable devpt. Ind. Soc. for Env. Health, Madurai	16.11.96	Invited speaker
18.	Dr. S.B. Pattnaik	Intl. Conf. on Urban Transportation	2-4 Oct.96	Presented a paper
19.		Ntl. Symp.on Present stature scenario of on invitation	1-2 Aug.96	Group Group discussion
20.		Intl. Symp. on Infrastructure of the future	25-29 Nov.96	Presented a paper
21.	Dr. V. Thamizh Arasan	Intl. Conf. on Intl. Conf. on Devpt. & Planning of urban transport in developing countries, New Delhi	12-16 Feb.96	Presented a Technical paper and chaired one session
22.		Intl. Conf. on Transport Survey: Quality and Innovation, Germany.	24-30 1997	Guest Speaker

4.5.16 List Of Publications

Journals

1. Iyer, K.C., Satyanarayana, K.N. and Mathews, M.S. "Deviation clauses in Indian Government Construction Contracts", Journal of The Institution of Engineers (India), Vol. 76, March 1996

2. Asimkar and H. Suresh Rao, "Watershed runoff using FEM", Jl. of Institution of Engineers (India) March 1997.
3. Raman, S. Mohan and N. Sunil Kumar, "Development of an expert system for flood management", Jl. of the Institution of Engineers (India) Civil Engineering Division, Vol.77, May 1996.
4. Ramamurthy, K., and Rajasekhar, G. "Flexural strength of hollow block masonry", Institution of Engineers (India) Journal, Civil Engineering Division, Vol.77, May 1996, pp 29-33
5. Athavan, S. Rajeev and N.R. Krishnaswamy, "Knowledge based decision support system for selection and design of reinforced earth foundations", Institution of Engineers (India) Jl. CV, Vol.77, August 1996, pp.115.120.
6. Satyanarayana, K.N. and Iyer, K.C. "Evaluation of Delays in Indian Construction Contracts", Journal of The Institution of Engineers (India), Vol. 77, Sept. 1996
7. Raman and V. Chandramouli, "Deriving a general operating policy for reservoir using neural network", Jl. of Water Resources Planning and Management, American Society of Civil Engineers, Vol. 122(5) 342-347, September, 1996.
8. Arumugam, R.A., and Ramamurthy, K., "Study on compressive strength characteristics of coral aggregate concrete" Magazine of Concrete Research, Vol.48, No.176, Sept. 1996
9. Ambalavanan, A. Roja "Feasibility studies on utilisation of waste lime and gypsum with fly ash", pp 611-616 - Indian Concrete Journal, November 1996, Vol.70, No.11
10. Srinivasulu, G. and Ramachandraiah, A. "Speech Transmission index as an objective measurement of speech Intelligibility", Journal of Acoustical Society of India, Vol. 24, 1996
11. Murthy, P.V.R. and Ramachandraiah A., "Study of noise levels in a densely built urban city" - Indian Highways - 1996
12. Ramamurthy, K., Radhakrishnan, R. and Rajasekhar, G. "Flexural strength behaviour normal to bed joint of plastered concrete block masonry", Masonry International, Journal of the British Masonry Society, Vol.9, No.3, 1996 pp 91-94
13. Sankaranarayanan and H. Suresh Rao, "Finite element analysis of free surface flows through gates", Intl. Jl. of Num. Methods in Fluids, Vol.22, pp.1-8, 1996.
14. Mohan and N. Arumugam, "Economic analysis of a tank irrigation system", Jl. of Indian Water Resources Society, Vol.16(2) pp.89-96, 1996.
15. Arumugam and S. Mohan, "Estimation of stagewise crop co- efficiencies for major crops", Jl. of Indian Water Resources Society, 1996, Vol.16, No.3, pp.29-34.
16. Mohan and N. Arumugam, "Relative importance of meteorological variables in evapotranspiration: Factor analysis approach", Jl. for Water Resources Management, Kluwer Academic Publishers, (Netherlands), Vol.10, No.1, pp.20, 1996.
17. Mohan, B. Simhadri Rao and N. Arumugam, "Comparative study of effective rainfall estimation methods for low land rice". Intl. Jl. of Water Resources Management, Kluwer Academic Publishers, (Netherlands), Vol.10, No.1, pp.35-44, 1996.
18. Q.Liang, L.E. Johnson and S. Mohan, "Autoregressive decision rules in aggregated reservoir operation", Jl. of Water Resources Planning and Management Division, ASCE, Vol.122, No.6, pp.438-440, 1996.
19. Mohan, "Parameter estimation of non linear muskingum models using genetic algorithms", Jl. of Hydraulic Engg. Division, ASCE, Vol.124, No.2, pp.1-6, 1996.

20. Mohan and N. Arumugam, "Discussion on Comparison of methods for estimating REFET", Paper No.8180-IR-6, JI. of Irrigation and Drainage Engg. Division, ASCE, Vol.122, No.6, pp.301-362, 1996.
21. Srinivasan and M.C. Phillipose, "Evaluation and selection of hedging policies using stochastic reservoir simulation", Intl. JI. of Water Resources Management, Vo.10(3), 1996, pp.163-188.
22. Srinivasan and M.C. Phillipose, "Stochastic approach in reservoir planning and design", JI. of IWRS, 16(1), 1996, pp.22-29.
23. Sankarasubramanian and K. Srinivasan, "Flood frequency models for Indian catchments - A Report", JI. of Institution of Engineers (India), Vol.77, 1996, pp.41-46.
24. Srinivasan, M.C. Phillipose and L. Sriram, "Within year hedging and its influence on reservoir performance", JI. of Institution of Engineers (India), 77, 1996, 17-22.
25. Trinadha Rao and V.R. Rengaraju, "Probabilistic model for conflicts at urban uncontrolled intersection", JI. of Transportation Engineering, ASCE, Jan.-Feb.1997, Vol.123, No.1, pp.81-84.
26. Pattnaik and R. Kumar, "Level of service of urban roads based on users' perception", Civil Engg. Systems, Vol.14(2) pp.89-110, 1996.
27. Thamizh Arasan and K. Jagadeesh, "Methodology to account for random composition of vehicles in saturated flow measurement", JI. of The Institution of Engineers (India), Vol.76, April 96, pp.205-208.
28. Thamizh Arasan, M. Wermuth and B. Srinivas, "Modelling of urban trip distribution", JI. of Transportation Engineering, ASCE, Vol.122, No.5, Sep.-Oct.96, pp.342-349.
29. Veletsos A.S., Prasad A.M. and Wu W.H., "Transfer Functions for Rigid Rectangular Foundation", JI. of Earthquake Engineering and Structural Dynamics, Vol. 26, (1997) pp. 5-17.
30. Balaji K., Somayaji S., and Meher Prasad A., "Estimation of Risk of Industrial Structures Against Failure from Cyclonic Winds" JI. Indian Buildings Congress, Vol. 4, No.1, Feb. 1997, pp.8-19

Conferences/Symposia etc.

1. Rajagopal and Sri Hari, "Analysis of anchored retaining walls", Intl. Symp. on Earth Reinforcement Practice, Fukuoka, Kyushu, Japan, Nov. 1996.
2. Rajagopal and Sri Hari, "Retaining walls with vertical anchors", Indian Geotechnical Conference, Madras, Dec. 1996.
3. Rajagopal, N.R. Krishnaswamy, T. Aruna Kumari and G. Madhavi Latha, "Finite element analysis of reinforced soil embankments", Indian Geotechnical Conference, Madras, Dec. 1996.
4. Rajagopal, N.R. Krishnaswamy and N. Unnikrishnan, "Sandwich mechanism in reinforced soil: A numerical modelling", Indian Geotechnical Conference, Madras, Dec. 1996.
5. Rajagopal, "Behaviour of reinforced soil embankments resting on soft foundation soils", Proc. of Indo-US workshop on Ground Improvement using Geosynthetics, New Delhi, 26-28, 1997.
6. Gandhi, "Insitu densification of deposited ash slurry", Proc. of Ntl. Workshop on Ash Ponds and Ash Disposal Systems held at IIT Delhi March 1996, pp.211-221.
7. Gandhi, "Pile driving analysis", Proc. of Ntl. Sem. on Piles, Indian Geotechnical Society, New Delhi, 29th Feb. 1996, pp.39-54.
8. Gandhi and D.K. Maharaj, "Analysis of piled raft foundation", Sixth Intl. Conf. on Piling and Deep Foundations held at Bombay, 15-17, Jan. 1997, pp.1.11.1- 1.11.7

9. Boominathan and Rathna Raju J., "Lime treated fly ash as embankment material", Proc. of Indian Geotechnical Conference, Madras, pp.253-256.
10. Boominathan, N.R. Krishnaswamy and P. Unnikrishnan Pillai, "Non-linear analysis of embankment reinforced with randomly oriented inclusions subjected to seismic loads", Proc. of Indian Geotechnical Conference, pp.593-596.
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13. Mohan and N. Arumugam, "Prediction of sedimentation rates in reservoir", Proc. Intl. Conf. on Reservoir Sedimentations, 9-14, Sep. 1996, Vol.2, pp.783-789, Colorado, USA.
14. S.Mohan, "Drought vulnearability assessment: The first attempt in pre-emptive strategies of its mitigation", Proc. Intl. Conf. on Disasters on mitigation, Jan. 19-22, 1996, Anna University, Madras, Vol.II, pp.B3.28 - B3.30.
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19. Sankarasubramanian and K. Srinivasan, "Evaluation of sampling properties and estimation of quantities for GEV distribution - L moments Vs. Conventional moments", Proc. of the NAWEC'96, Calif, USA.
20. Kalynaraman and D.P. Eknath, "Second order plastic analysis of steel frames", Proc. Structural Engg. Convention 1997, Feb 12-14, IIT Madras.
21. Meher Prasad, V. Kalynaraman C.Ganapathy, C. Santhi and K.Mahadevan, "Application of sleeved column system to fixed offshore platform", Proc. Structural Engg. Convention 1997, Feb.12-14, IIT Madras.
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25. Pattnaik and S.R. Mannava, "Performance analysis of site transport undertakings to mass transit systems - Tamilnadu as a case study", Proc. of the Intl. Symp. on Infrastructure of the future, Nov. 1996, Bangalore.
26. Pattnaik and S.R. Mannava, "Integrated urban public transit for sustainable development", Proc. of the Intl. Conf. on Civil Engg. for sustainable Devpt., Univ. of Roorkee, Feb. 1997.
27. Raman and V. Chandramouli, "Optimal operation of multi- reserivior system using dynamic programming and neural network", Proc. of XIth Intl. Conf. on Application of Artificial Intelligence in Engineering, Clear Water, Florida, USA, September 1996.
28. Raman and N. Sunil Kumar, "Decision support system for real-time multi-reserivior operation", Intl. Conf. on Water Resources and Environment Research towards 21st Century, Kyoto, Uji, Japan. Oct. 1996.
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30. Uma S.R. and Meher Prasad A., "Seismic Evaluation of Lightly Reinforced Concrete Frames Considering Joint Flexibility" Proc. of Structural Engineering Convention - 1997, IIT, Madras, Feb. 12-14, 1997, pp.535-544.
31. Meher Prasad, A., Kalyanaraman, V., Ganapathy, C., Santhi, C., and Mahadevan K. "Application of Sleeved Column System to Fixed Offshore Platforms", Proc. of Structural Engineering Convention - 1997, IIT, Madras, Feb. 12 - 14, 1997, pp.603-612.
32. Meher Prasad A., "Finite Element Method in Structural Dynamics including Transient Loadings", Proc. of Symposium on Finite Element Technology in Indian Industry, 26 -27, June 1996, IIT, Madras, pp.Amp 1 - Amp 11
33. Verma Ajay and Meher Prasad A., "Dynamic Analysis of Guyed Tower Under Simulated Wind", Proc. of Wind Effects on Structures", SERC Gaziabad, 3-5 April 1997,
34. Umar S.R., and Meher Prasad, A., "Analytical Modeling of RIC Beam Column Connection under Cyclic Loads", Proc. of XI World Conference on Earthquake Engineering , Acapulco, Mexico, June 23-28, 1996, Paper#1869 CDROM Disk # 4/4

4.5.17 Books

S.No.	Authors	Title	Publishers
1.	Krishnamoorthy and S. Rajeev	Artificial Intelligence and Expert Systems for Engineering	CRC Press Inc. USA and UK under General Engineering and Computer Science Series, 1996, p.

4.5.18 Other Details:

1. Sri Amit Nag B.Tech (1996) Governor's Prize for all round proficiency in the B.Tech Programme (Curricular and extra curricular)
2. Sri Piduri Raveendra M.Tech (1996) won Valli Anantharamakrishnan Merit Prize and K.Devarajan Memorial Prize
3. Sri G. Bhanu Prakash B.Tech (1996) won L & T Endowment prize

4. M.V. Sivaselvan final year B.Tech Civil Engineering received the First Prize for the best paper "Smart Structures a New Paradigm in Structural Engineering" at PIAZZE 96, a National level technical symposium for Civil Engineering students held at PSG College of Technology, Coimbatore on 13th and 14th September 1996.
5. Shri G. Srinivasulu, M.S. Research scholar, Building Technology and Construction Management Division, awarded the outstanding performance prize for his paper entitled, "Some aspects of acoustics of large halls", presented in the Madras Regional Chapter of Acoustic Society of America (MIRC) held on 18-19 August 1996 at IIT Madras.
6. Civil Engineering Association and The Students Chapter of the Institution of Engineers (India), organised CEAFEST 96 from 23rd to 25th of February, 1996 for the students Engineering Colleges in India.

4.6 Computer Science and Engineering Department

1. Academic Programmes

1.1 New Courses Introduced:

S.No.	Course No.	Title	Structure	Faculty
1.	CS 762	Introduction to High Performance Computing	4 0 0 4	C. Siva Ram Murthy C. Pandu Rangan
2.	CS 794	Computer Vision	3 1 0 4	Sukhendu Das B. Yegnanarayana Hema A. Murthy

1.2 Details of Faculty:

Professors

R. Kalyana Krishnan, Ph.D.(Yale)

Kamala Krithivasan, Ph.D.(Madras)

C.R.Muthukrishnan, Ph.D. (IIT Kanpur)

C. Pandu Rangan, Ph.D. (IISc)

S.V. Raghavan, Ph.D. (IIT Madras) [Head]

B. Yegnanarayana, Ph.D. (IISc)

Specialisation

Computer Architecture, Computer Graphics, Digital System Design, Microprocessors, Statistical Signal Processing

Analysis of Algorithms, Automata Theory and Formal Languages, Computational Geometry, Computation Biology

Distributed Systems, Compilers and Operating Systems, Software Quality, Software Engineering, Object Oriented Design and Applications, Virtual Reality, Performance Modelling and Systems Simulation

Computational Geometry, Graph Algorithms, Machine Learning, Parallel and Randomized Algorithms, Cryptography, Computational Biology

Performance Evaluation of Computer Systems, Computer Architecture, ASIC Design, Software Engineering Environments, Multimedia Systems, Mobile Networks, Highspeed Networks

Computer Vision, Digital Signal Processing, Neural Networks, Speech Processing

T.A. Gonsalves, Ph.D. (Stanford)

Computer networks, Distributed Systems, Operating Systems, Performance Evaluation, Telecommunications

Associate Professors

C. Siva Ram Murthy, Ph.D. (IISc)

Parallel and Distributed Computing, Real-Time Systems, Computed Networks

S. Raman, Ph.D. (IIT Madras)

Microprocessors, Multimedia systems, Natural Language Processing, Data Mining and KDD

Assistant Professors

Deepak Khemani, Ph.D. (IIT Bombay)

Artificial Intelligence, Knowledge Based Systems, Natural Language Processing, Neural Networks

Hema A. Murthy, Ph.D. (IIT Madras)

Computer Graphics, Pattern Recognition, Speech Processing, Fractals

D. Janaki Ram, Ph.D. (IIT Delhi)

Distributed Systems, Object Oriented Systems, Database Systems, Software Engineering, CAD/CAM,

Ravi Mittal, Ph.D. (IIT Delhi)

High Speed Computer Networks, Dependable Computing, Parallel Architectures

P. Sreenivasa Kumar, Ph.D. (IISc.)

Graph Algorithms, Parallel Computing, Sparse Matrix Computations

Sukhendu Das, Ph.D. (IIT Kharagpur)

Computer Graphics, Computer Vision, Neural Networks, Robotics, Analog and Digital Systems

R. Sundar, Ph.D. (IIT Madras)

Analog and digital systems, Microprocessors, Speech Processing, CAD for VLSI

Lecturers

C. Chandra Sekhar, Ph.D. (IIT Madras)

Microprocessors, Digital systems Design, Neural networks, Speech Processing

Scientific Officer Gr.I

J.T. Sanjeeva Murthy, M.Tech. (IIT Delhi)

1.3 Number of students on roll:

Programme	I Year	II Year	III Year	IV Year	V Year	Total
B.Tech.	30	31	30	30	-	121
M.Tech	38	45	-	-	-	83
M.S.	9	16	20	7	1	53
Ph.D.	2	2	2	4	11	21
Total	79	94	52	41	12	278

1.4 No. of Scholarship Holders:

Programme	Institute	Others	Total
M.S.	29	-	29
Ph.D.	8	4	12
Total	37	4	42

1.5 No. of Degrees Awarded:

Programme	Number Awarded
B.Tech.	26
M.Tech.	42
M.S.	7
Ph.D.	3
Total	78

1.2 Short Term Courses/Workshops/Seminars/Symposia/Conferences organised by the Department:

S.No.	Co-ordinator(s)	Title of the Workshop/Seminar/Symposium	Period
1.	Dr. Timothy A. Gonsalves	National Conferene on Communications	Jan.31 - Feb. 2, 1997
2.	Dr. Ravi Mittal Dr. C.R. Mthukrishnan	High Speed Computing Networks (LANs to ATM)	Aug.9-10, 1996

1.3 Short Term Courses/Workshops/Seminars Symposia/Conferences/Training attended by the faculty members in recognised academic Institutions and Public Section Units:

S.No.	Co-ordinator(s)	Title of the Workshop/Seminar/Symposium	Period
1.	Dr.B. Yegnanarayana	International Conference on Neural Networks, Washington, USA.	June 3-6, 1996
2.		National Conference on Communications	Jan.31-Feb.2. '97

S.No.	Co-ordinator(s)	Title of the Workshop/Seminar/Symposium	Period
3.	Dr.Kamala Krithivasan	National Seminar on Advanced Mathematical Approach in Problems in Industry, Andhra Univ. Visakapatnam	1-2, Oct. 1996
4.	Dr. S. Raman	Technology Appreciation Program on Multi Media Technology and Applications	one day
5.	Dr. Hema A. Murthy	National Conference on Communications	Jan.31-Feb.2, '97
6.	Dr. Sukhendu Das	Discussion meeting on recent advances in Signal Processing and Communications, IISc., Bangalore	Jan.18-20, 1997
7.		International Workshop on Parallel Processing, IISc., Bangalore	Dec.23-31, 1996
8.		Indian Conferene on Pattern Recognition, Image Processing and Computer Vision. IIT Kharagpur	Dec.12-16, 1996
9.	Dr. Ravi Mittal	XXXVI Annual Convention of CSI, Bangalore	Oct.30-Nov.3, 1996
10.	Dr. Ravi Mittal	4th Int. Conf. on Advanced Computing Bangalore	Dec.16-18, 1996
11.		VLSI Design: 10th Int. Conf. on VLSI Design Hyderabad	Jan.4-7, 1997
12.	Dr.C. Chandra Sekhar	Conf. on Communication Technologies IISc., Bangalore	Dec.14-16, 1996

1.4 Special Lectures delivered by the faculty in other Institutions:

S.No.	Name of Faculty	Topic of Lecture	Venue and Date
1.	Dr.B.Yegnanarayana	Speech Technologies in Indian Context	IISc., Bangalore July 12, 1996
2.		Artificial Neural Networks	14th WCNDT, New Delhi, Dec.7, 1996
3.	Dr.B.Yegnanarayana	ANN and its applications in Non-destructive Testing	IGCAR, Kalpakkam Feb.13, 1997
4.	Dr.Kamala Krithivasan	National Seminar on Advanced Mathematical approach to problem in industry	Andhra Univ. Visakapatnam, Oct.1-3, 1996
5.		Invited Talk	St.Joseph's College, Trichy Dec.7, 1996
6.		Inaugural address at PESCAM 1997	Periar Maniammai College of Tech. for



1.6 Honours and Awards:

S.No.	Name of Faculty	Honours/Awards	Purpose
1.	Dr.Ravi Mittal (Editor)	Trends in Advanced Computing	Tata McGraw Hill 1996

1.10 Memberships/Fellowships in Professional Bodies:

1.	Dr.B. Yegnanarayana	: Fellow of IETE (India) Fellow of Indian National Academy of Engineering (INAE) 1995 Member of Acoustical Society of India Member of Computer Society of India Senior Member of IEEE (USA) Member of European Assoc. for Signal Processing (Switzerland) Member of International Neural Network Society (USA)
2.	Dr.Kamala Krithivasan	: Member, Computer Society of India Member, Indian Society for Technical Education Member, EATCS Member, Board of Studies in Mathematics, Annamalai Univ. Chairman, Board of Studies, Sri Padmavathi Mahila Vishva Vidalaya, Tirupathy
3.	Dr.T.A. Gonsalves	: Member of IEEE Member, ACM Member, Computer Society of India
4.	Dr.C.Siva Ram Murthy	: Member, IEEE Computer Society
5.	Dr.Deepak Khemani	: Member of IEEE Computer Society of India Member of IEEE System, Man and Cybernetics Society
6.	Dr.Sukhendu Das	: Member, IEEE (USA)
7.	Dr.Ravi Mittal	: Member, IEEE Computer Communication Society Member, Advanced Computing Society
8.	Dr.C.Chandra Sekhar	: Member, IEEE (USA)

2. Design and Development:

2.1 Brief and specific details of Process/Instruments/Equipment/Software Designed & Developed:

Dr. T.A. Gonsalves

- a) Excel switch 20x family of low-cost 2-segment ethernet bridges. Excel Switch Rli Remote Ethernet Bridge, supports campus-wide LAN over existing telephone cable. Commercialised by Excellent Computers, Madras (1966).

- b) Nova Switch family of high-performance Ethernet switches with 24-48 10 Mb/s ports, 100 Mb/s fast ethernet and 100 Mb/s FDDI uplinks. Commercialised by Acacia Networks, USA. (1996).
- c) Dect protocol stack call-processing and PABX software for the corDECT wireless in Local Loop. Licensed to Crompton Greaves, ECIL, Shyam Telecom and WS Telesystems in India, BWCP Ltd. in China. (1996).

Dr. Deepak Khemani

- a) Launch campaign monitoring and trouble shooting aid. (1996).

2.2 New Facilities added and major Equipment procured:

1. Silicon Graphics workstation procured for Speech and Vision Lab.
2. Netcon Smartbits ethernet performance tester, with 20x 10 Mbps ports and 2x100 Mb/s ports

3. Research and Consultancy:

S.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Co-ordinator(s)
1.	ANN Models for encrypted speech	1995-98	DRDO	10.00	Dr.B.Yegnanarayana Dr.C.Chandrasekhar Dr.Deepak Khemani
2.	Computational Geometry and Applications	1994-98	DST	5.50	Dr.Kamala Krithivasan Dr.C.Pandu Rangan
3.	Computer based teaching Systems for CS courses	1995-98	AICTE	5.10	Dr.C.Pandu Rangan
4.	Fibre Optics Railway Signalling and Commn. Systems	1993-96	DOE	17.00	Dr.Ashok Jhunjhunwala Dr.Bhaskar Ramamurti Dr.T.A.Gonsalves
5.	FDDI Station Management Protocols and ethernet bridge	1993-97	DOE	27.00	Dr.Ashok Jhunjhunwala Dr.Bhaskar Ramamurti Dr.T.A.Gonsalves
6.	Development of Software for Russian-English translation	1995-98	ISRO	7.90	Dr.S.Raman Dr.R.Sundar
7.	Expert System App. in Indian Space Programme	1996-97	ISRO	6.00	Dr.Deepak Khemani
8.	Keyword Sptting in continuous speech	1995-97	IIT-FRG	-	Dr.B.Yegnanarayana Dr.C.Chandra Sekhar Dr.R.Sundar

3.1 Industrial Consultancy (on going):

S.No.	Title	Industry	Value (in Lakhs)	Co-ordinator(s)
1.	Video Telephony Over Internet	Object Oriented Prog. Services, Chennai	15.00	Dr.Ashok Jhunjunwala Dr.R.Aravind Dr.Devendra Jalihal Dr.Baskar Ramamurthy Dr.T.A.Gonsalves Dr.K.Gridhar Dr.C.Mathiazhagan
2.	Development of ISDN Terminals	Tata Telecom Ghandinagar	8.00 + Roy	Dr.Ashok Jhunjunwala Dr.R.Aravind Dr.Devendra Jalihal Dr.Baskar Ramamurthy Dr.T.A.Gonsalves Dr.K.Gridhar Dr.C.Mathiazhagan
3.	Development of ISDN Interface for paradigm Exchange	Tata Telecom Gandhinagar	9.00	Dr.Ashok Jhunjunwala Dr.R.Aravind Dr.Devendra Jalihal Dr.Baskar Ramamurthy Dr.T.A.Gonsalves Dr.K.Gridhar Dr.C.Mathiazhagan
4.	EI Circuit Multiplexer	Shyam Telecom. New DElhi	1.50 + 2.5% Roy.	Dr.Ashok Jhunjunwala Dr.R.Aravind Dr.Devendra Jalihal Dr.Baskar Ramamurthy Dr.T.A.Gonsalves Dr.K.Gridhar Dr.C.Mathiazhagan
5.	Wireless in Local Loop	Analog Devices,USA Westel Wireless, Bangalore Crompton Greaves, Bangalore ECIL, Hyderabad Shyam Telecom, New Delhi	300.00 + Roy.	Dr.Baskar Ramamurthy Dr.Ashok Jhunjunwal Dr.T.A.Gonsalves Dr.C.Mathiazhagan

S.No.	Title	Industry	Value (in Lakhs)	Co-ordinator(s)
6.	Computer Networking	Acacia Networks, USA	130.00	Dr.T.A.Gonsalves Dr.Ashok Jhunjunwal Dr.Baskar Ramamurthy Dr.C.Mathiazhagan
7.	Network Educator Kit	Benchmark System Madras	1.25 + Roy.	Dr.T.A.Gonsalves Dr.Ashok Jhunjunwal Dr.Baskar Ramamurthy Dr.C.Mathiazhagan

5.3 RBIC (on going):

S.No.	Name of Investigator/Co-Investigator	Number	Value (in Lakhs)
1.	Dr.B.Yegnanarayana Dr.Sukhendu Das Dr.R.Sundar	RBIC/94-95/001/PGGG/BYEG	2.00
2.	Dr.B.Yegnanarayana Dr.R.Sundar	RBIC/95-96/CSE/002/TELCO(AUM)	4.00

6. Research Publications:

(a) Journals - International and National

1. B.Yegnanarayana, On timing in time-frequency analysis of speech signals, *Sadhana*, Vol.21, Part 1, pp.5-20, 1996.
2. Raghu and B.Yegnanarayana, Segmentation of Gabor filtered textures using deterministic relaxation, *IEEE Trans. Image Processing*, Vol.5, No.12, pp.1625-1636, Dec. 1996.
3. Chandra Sekhar and B.Yegnanarayana, Recognition of stop-consonant-vowel (SVC) segments in continuous speech using neural network models, *Journal of Institution of Electronics and Telecommunication Engineers (IETE)*, Vol.42, Nos.4&5, pp.269-280, July-Oct. 1996.
4. B.Yegnanarayana and P.Satyanarayana Murthy, Source-system windowing for speech analysis and synthesis, *IEEE Trans. Speech and Audio Processing*, Vol.4, No.2, pp.133-137, 1996.
5. Rajendran and B.Yegnanarayana, Word boundary hypothesization for continuous speech in Hindi based on Fpatterns, *Speech Communication*, Vol.18, No.1, pp.21-46, 1996.
6. B.Yegnanarayan, Deepak Khemani and Manish Sarkar, Neural Networks for contract bridge bidding, *Sadhana*, Vol.21, part 3, pp.395-413, June 1996.
7. Easwarakumar, S.V. Krishnan, C. Pandu Rangan and S. Seshadri, Optimal Parallel algorithm for finding st-ambitus of a planar biconnected graphs, *Algorithmica*, Vol.15, pp.242-255, 1996.
8. Satyan and C. Pandu Rangan, The parity path problem on some subclasses of perfect graphs, *Discrete Applied Maths*, Vol.68, pp.293-302, 1996.

9. Balachandran, P. Nagavasmsi and C. Pandu Rangan, Clique Traversal and Clique Independence of comparability graphs, *Information Processing Letters*, Vol.58, pp.181-184, 1996.
10. Mandal, G. Venkatesan and C. Pandu Rangan, Tree 3-spanners on interval, permutation and regular bipartite graphs, *Inform. Proc. Letters*, Vol.59, pp.97-102 1996.
11. Balachandran and C. Pandu Rangan, All-pairs-shortest-length on strongly chordal graphs, *Discrete Applied Mathematics*, Vol.69, pp.169-182, 1996.
12. Sain and T.A. Gonsalves, KeRTESy, A realtime Event-driven Microkernel, *Dr. Dobb's Jour.* March 97, pp.48-58.
13. Anthony Louis Piriya Kumar and C. Siva Ram Murthy, Optimal scheduling of parallel tasks of tracking problem onto multiprocessors, *IEEE Trans. on Aerospace and Electronic Systems*, Vol.32, No.2, pp.722-732, 1996.
14. Antony Louis Piriya Kumar and C. Siva Ram Murthy, Optimal compile-time multiprocessor scheduling based on the 0-1 linear programming algorithm with the branch and bound technique, *Journal of Parallel and distributed computing*, Vol.35, pp.199-204, 1996.
15. Balasubramanya Murthy and C. Siva Ram Murthy, Gaussian elimination based algorithm for solving linear equations mesh-connected processors, *IEE Proc. Part E, Computers and Digital Techniques*, VI.143, No.6, pp.407-412, 1996.
16. Machiraju Vijay and C. Siva Ram Murthy, FAult tolerant systolic evaluation of polynomials and exponents of
17. polynomials for equispaced arguments, *IEEE Trans. on Circuits and Systems*, Vol.44, No.3, pp.246-250, 1996.
18. Yegnanarayana, Deepak Khemani and Manish Sarkar, Neural Networks for contract bridge bidding, *Sadhana (Indian Academy of Sciences, Bangalore)*, Vol.19, Part 3, June 1996, pp.1-9.
19. Raman and N.Rama Krishna Reddy, A transputer-based parallel machine translation systems for Indian languages, *Microprocessors and Microsystems*.
20. Das, S.B. Chakraborty and S. Das, Cut-off frequencies of Transmission lines consisting of pair of cylinders, *IEEE Trans. on Microwave Theory and Techniques*, Vol.44, No.11, Nov. 1996, pp.2110-2112.
21. Krishnamachari and R. Mittal, Design and Analysis of a centralized multiring architecture, *Information Processing Letters*, 58, 1996, pp.17-21.

(b) Conferences - International and National

1. B.Yegnanarayana and P. Satyanarayana Murthy, New directions in speech processing, *Proc. National Conf. on Communications*, IIT Madras, pp.169-174, Jan.31-Feb.2, 1997.
2. B.Yegnanarayana, Phase, residual and suprasegmental information in speech processing, *Proc. Int. Conf. on Communication Technologies (CT-96)*, Indian Institute of Science, Bangalore, pp.14-19, 1996.
3. Chandra Sekhar, B.Yegnanarayana and R. Sundar, A constraint satisfaction model for recognition of stop consonant-vowel (SCV) utterances in Indian languages, *Proc. Int. Conf. on Communication Technology (CT-96)*, Indian Institute of Science, Bangalore, pp.134-139, Dec. 1996.

4. Chandra Sekhar and B.Yegnanarayana, Neural network models for spotting stop-constant-vowel (SCV) segments in continuous speech, Proc. Int. Conf. on Neural Networks, ICNN-96, Washington D.C., June 3-6, 1996.
5. Manish Sarkar and B.Yegnanarayana, A clustering algorithm using evolutionary programming, Proc. Int. Conf. on Neural Networks, ICNN-96, Washington D.C., June 3-6, 1996.
6. Renuka, A. and Kamal Krithivasan, Minimal Paths In Grids Amidst Movable Obstacles, SIAM conference on discrete algorithms, June 17-20, 1996, Baltimore, John Hopkins University, USA.
7. Renuka, A. and Kamal Krithivasan, Isothetic Path planning for a hyperrectangular obstacles, International Conf. on Control, Automation, Robotics and Vision (ICARCV'96), Dec. 3-6, 1996, Westin Stamford, Singapore.
8. Renuka, A. and Kamal Krithivasan, Algorithms for a point robot amidst stationary obstacles using SPM, One day Symposium on Mathematical Methods and Applications, Dec. 22, I.I.T. Madras, India.
9. Kamal Krithivasan, R. Rama, V. Sunitha, Splicing on arrays National Seminar on Advanced Mathematical Approaches to problems in Indian Industry, Andhra University, October 2, 1996, Visakapatnam, India.
10. Jeyalakshmi and Kamal Krithivasan, Dynamically computing the union of three coloured triangles, National Seminar on Advanced Mathematical Approaches to problems in Indian Industry, Andhra University, Oct.2, 1996, Visakhapatnam, India.
11. Preetham, Kamal Krithivasan, C. Pandu Rangan and Joh Sebyan, Parallel Algorithm for maximum empty L-shaped polygon, HIPC, 1996, Trivandrum, India.
12. Kamal Krithivasan, A. Rema, S.Suchitra and P.I. Vijayakumar, Velocity planning for a robot moving along the shortest straight line path among moving obstacles, Canadian Conf. on Computational Geometry, August 12-15, 1996, Canada, pp.149-159.
13. Balakrishnan, A. Rajarama, C. Pandu Rangan and C.K. Wong, The even adjacency split problem on certain classes of perfect graphs, International Computer Symposium (ICS'96), Taiwan, Dec. 1996.
14. Thirumurthy, M. Ravichandran and T.A. Gonsalves, Comparison of Buffer Management Policies, Proc. 3rd National Conf. Commun. (NCC'97), IIT Madras, Jan-Feb. 97, pp.162-166.
15. Elwin Stelzer, A. Jhunjhuwala, R.L. Narasimhan, T.A. Gonsalves and D.N. Rajan, Computer TELEphony Integration, Proc. 3rd National Conf. Commun. (NCC'97), IIT Madras, Jan-Feb. 97, pp.240-243.
16. Ravichandran, M. Bomb, R.J. Enoch and T.A. Gonsalves, A Family of Low-cost Ethernet Switches, Proc. 3rd National Conf. Commun. (NCC'97), IIT Madras, Jan-Feb. 97, pp.256-260.
17. Manimaran and C. Siva Ram Murthy, A new study for fault tolerant real-time dynamic scheduling algorithms, Proc. Int. Conf. on High Performance Computing, Trivandrum, Dec.19-22, 1996.
18. Manimaran, Anand Manikutty and C. Siva Ram Murthy, DHARMA: A tool for evaluating dynamic scheduling algorithms for real-time multiprocessor systems, Proc. International Conf. on Advanced Computing, Bangalore, Dec.16-18, 1996.
19. Balasubramanya Murthy and C. Siva Ram Murthy, A new LU factorization based linear system solver for hypercubes, Proc. Int. Conf. on Advanced Computing, Bangalore, Dec.16-18, 1996.
20. Somayajulu and Deepak Khemani, Planning for task instruction, Proc. of Int. Conf. on Knowledge based Computing Systems, Mumbai, Dec. 1996, pp.291-302.

21. Manish Sarkar, B. Yegnanarayana and Deepak Khemani, Feed forward neural networks and fuzzy classification, Proc. on Fourth Int. Conf. on Advanced Computing, Dec.16-18, 1996, Bangalore, India.
22. Sridharan and S. Raman, Video handling in multimedia: A Review, Fourth Int. Conf. on Advanced Computing (ADCOMP '96), Bangalore, India, Dec.16-18, pp.182-186, 1996.
23. Gowri Shankar and S. Raman, An experimental survey on multimedia education, Int. Conf. on Multimedia Technology and Management, Hong Kong, 11-14 Dec. 1996, pp.304-313.
24. Sridharan and S. Raman, Characteristics of video data for signal analysis, Proc. ICSP'96, CIE Third Int. Conf. on Sig. Proc. Beijing, China, Oct.14-18, 1996.
25. Sridharan and S. Raman, Syntujsized data structure for video data: a formal specification: Proc. ICIP 96, IEEE Sig. Proc. Soc. Lausanne, Switzerland, 16-19, Sept. 1996.
26. Gayathri and S. Raman, The role of reversible grammer in language-based annotation of multimedia data, Second Int. Conf. on Dravidian Linguistics, Kuppam, 23-24, June 1996.
27. Gowri Shankar and S. Raman, ASHA: Authoring System for Hipermedia Applications, Symp. on Machine Aids for Translation and Communication '96, New Delhi, April 1996.
28. Ilango Krishnamurthi and S. Raman, Evaluating multimedia Database management systems, Symp. on Machine Aids for Translation and Communication '96, New Delhi, April 1996.
29. Hema A. Murthy, Feature extraction for speaker identification over telephone channels, SPCOM-97.
30. Hema A. Murthy, The real root cepstrum and its appliation to speech processing, NCC-97, Madras, India.
31. Balani, Arsham A.M., Ravi Mittal, A general reconfiguration technique for fault tolerant processor architecture, 10th Int. Conf. on VLSI Design, Hyderabad, Jan.4-7, 1997, pp.360-367.
32. Jacob, Ravi Mittal, Efficient routing in De Bruijn networks, 4th Int. Conf. on Advanced Computing, Bangalore, Dec.16-18, pp.245-253.
33. Kalyana Ram Prasad and P. Sreenivasa Kumar, A new algorithm for recognizing strongly chordal graphs, Proc., of 6th National Seminar on TCS, Banasthali Vidyapith, Rajasthan, Aug. 1996.

6.1 Distinguished Visitors to the Department:

S.No.	Name of Visitor and Designation	Date of Visit	Purpose of Visit
1.	Dr. Eric Allender	Jan. 1997	Give a seminar and discussion
2.	Dr. Habil Peter Struss Priv. doz. T.U. Muenchen	Dec.18-23, 1996	Talk on qualitative Models for ECo-Systems

6.2 Any Other Relevant Details:

Dr. Ravi Mittal:

Program Co-Chair, Fourth International Conference on Advanced Computing (ADCOMP'96), Bangalore, Dec.16-18, 1996.

Chairman, Student Paper Contest, 36th Annual Convention of CSI, Oct.30, Nov.2, 1996.

Member, Programme Committee, VLSI Design, 96, CSI'96.

4.7 Electrical Engineering Department

4.7.1 Introduction

The Department of Electrical Engineering is an integrated one encompassing both the areas of Electrical and Electronics Engineering. At present the Department comprises the following laboratories.

- * Communication and Digital Signal Processing Laboratory
- * Electronic Circuits/Microelectronics Laboratory
- * Amorphous Semiconductor Laboratory
- * Aeronomy and Laser Communications Laboratory
- * Television Engineering Laboratory
- * Control Engineering including Robotics Laboratory
- * Electrical Machines and Drives Laboratory
- * Measurements and Instrumentation Laboratory
- * Power Systems Laboratory
- * High Voltage Engineering Laboratory
- * PC Laboratory
- * Microprocessor and Digital Systems Laboratory
- * Optical Communication Laboratory
- * Photonics Laboratory

4.7.2 Academic Programmes

B.Tech Degree in Electrical Engineering:

Beginning July 1993 there is an integrated Electrical Engineering degree course that combines the aspects of Power, Control and Communication Engineering.

M. Tech Degree in Electrical Engineering

Four major streams of study are available at M.Tech level:

- i) Communication Systems Engineering
- ii) Energy Systems Engineering
- iii) Integrated Electronic Circuits and Systems
- iv) Control, Guidance and Instrumentation Systems

Substantially revised curriculum will be introduced starting July 97 in first and third streams.

A new VLSI user oriented M.Tech. program is proposed. Senate approval is awaited.

Areas of research for M.S. and Ph.D. Degree in Electrical Engineering:

Electronic Circuits, Communication Systems, Digital Techniques and Computer Technology, Electromagnetic Interference and Compatibility, Fibre Optic Communication, Image and Digital Signal

Processing, Laser Communication, Microwave Engineering, Television Engineering, Semiconductor Devices, Control Engineering, Electrical Machines and Drives, Guidance Systems, High Voltage Engineering, Measurements and Instrumentation, Networks and Systems, Simulation of Power Electronic Systems, Power Systems, Photonics, and Robotics.

4.7.2.1 New Courses Introduced

Sl.No	Course No.	Title	Faculty
1	EE 628	Semiconductor device Modeling and Technology	Dr. K.R.K. Rao Dr. K.N. Bhat
2	EE 648	Computer Organization and Architecture	Dr. S. Srinivasan
3.	EE 740	VSDI Design Mini project	Dr. V. Vasudevan

4.7.2.2. Students on Roll (To be obtained from Academic Section)

Programme	I Year	II Year	III Year	IV Year	V Year	Total
Ph.D	2	2	5	3	11	23
M.S.	5	19	18	7	7	56
M.Tech.	33	28	-	-	-	61
B.Tech.	76	64	76	72	4	292
Total	116	113	99	82	22	432

4.7.2.3. Number of Fellowship/Scholarship Holders

Programme	Institute	CSIR	Total
Ph.D.	3	3	6
M.S.	34	-	34
M.Tech.	50	-	50
Total	87	3	90

4.7.2.4. Number of Degrees Awarded

Programme	No. Awarded
Ph.D.	8
M.S.	11
M.Tech.	48
B.Tech.	72
Total	139

4.7.3 Faculty and their Development

4.7.3.1 Faculty Name and Qualification

Name and Qualification

Professors

Ashok Jhunjhunwala, Ph.D.(Maine)

M.V.Chalapathi Rao, Ph.D.(IIT Madras)

C.Eswaran, Ph.D.(IIT Madras)

P.A. Janakiraman, Ph.D.(IIT Madras)

A. Kuppurajulu, Ph.D. (Moscow)

M. Mukunda Rao, Ph.D. (Andhra)

M.S.Narasimhan, Ph.D.(IIT Bombay)

K.Narayana Bhat, Ph.D.(IIT Madras)

K.M.M. Prabhu, Ph.D. (IIT Madras)

K.Radhakrishna Rao, Ph.D.(IIT Kanpur)

J.P. Raina, D.Sc.(Louvain)

K. Ramar, Ph.D.(IIT Madras)

P. Sankaran, Ph.D.(IIT Madras)

V.V. Sastry, Ph.D.(IIT Kharagpur)

G. Sridhara Rao, Ph.D.(IIT Madras)

S. Srinivasan, Ph.D.(IIT Madras)

Vedam Subrahmanyam, Ph.D.(IIT Madras)

V. Venkata Rao, Ph.D. (Iowa)

C. Venkateshaiah, Ph.D.(IIT Madras)

Associate Professors

Bhaskar Ramamurthi, Ph.D.(California)

Dattatreyan, Ph.D. (Sheffield)

V. Jagadeesh Kumar, Ph.D.(IIT Madras)

Assistant Professors

Amitava Dasgupta, Ph.D.(IIT Kharagpur)

M. Antony Reddy, Ph.D.(IIT Madras)

Enakshi Bhattacharya, Ph.D.(TIFR Bombay)

S. Karmalkar, Ph.D.(IIT Madras)

M. Krishnamurthi, M.Tech.(IIT Madras)

Major area of Specialisation

Communication Networks, Fibre Optics,

Surface Acoustic Wave Devices

Control Theory

Networks, Digital Filters Microprocessors

Robotics, Control Systems, Instrumentation,

Image Processing

Power Systems, Computer Applications

Lasers, Fibre Optics

Antenna Engineering Applied Electromagnetics

Semiconductor Fabrication

Signal Processing

VLSI, Analog and Digital IC's

Fibre Optics, Television

Power Systems, Computer Applications

Networks, Magnetic Materials

Machines, Power Electronics, Simulation

Machines, Power Electronics, [Head] Simulation

Microprocessors, Microcomputers

Power Electronics

Digital Signal Processing, Communications

High Voltage, Power Systems

Digital Communication and Communication

networks. Signal processing

Microwaves

Measurements, Instrumentation

Si and GaAs Devices, Technology and Simulation

Electronic Circuits

Solid State Devices

VLSI, Semiconductor Devices

Power Systems

P.C.Majhee, M.Tech. (IIT Madras)
 G.T. Manohar, M.Tech.(IIT Madras)
 Nandita Dasgputa, Ph.D.(IIT Madras)

P. Sasidhara Rao, Ph.D.(IIT Madras)
 T.J.Vitto, Ph.D. (IIT Madras)
 C. Mathiazhagan, Ph.D.(Univ. California)
 Vinita Vasudevan, Ph.D.(IIT Bombay)
 Devendra Jalihal, Ph.D. (Duke)
 R. Aravind, Ph.D.(California)
 K. Giridhar, Ph.D. (California)

Lecturer

R. Sarathy

Principal Scientific Officer

P.R. Vaya, Ph.D.(IIT Madras)

Senior Scientific Officers Grade II

T.V. Gopal, M.S. (IIT Madras)

M. Kumaravel, Ph.D. (IIT Madras)

K. Ponnuraju, Ph.D. (IIT Madras)

H. Renganathan, M.S.(IIT Madras)

Senior Design Engineers

P.Ramaseshagiri Rao, M.S.(IIT Madras)

Ranjana Shukla, M.S.(IIT Madras)

V.N. Shukla, M.S.(IIT Madras)

Measurements, Instrumentation
 Microprocessors, Computers, Control Systems
 Si and III-V Semiconductor Devices, Technology &
 Simulation

Electrical Machines

Semiconductors

RF Communication, Analog Circuits of Telematics
 Devices, CAD for VLSI

Statistical Signal Processing

Image Processing and Compression

Communication and Signal Processing

High Voltage, Engineering

Semiconductors and Opto- electronic Device
 Technology

Measurements and Instru-entation, Computer
 System Management, Graphics

Instrumentation, Digital Systems,
 Microprocessors

Solid State Electronic Devices, Semiconductor
 Technology

DSP, Microprocessor Systems

Semiconductor Fabrication

Microprocessors and Computers

Microprocessors and Computers

4.7.3.2. Short-term Courses/Workshops/Seminars/Symposia/Conferences conducted

S.No.	Co-ordinator(s)	Title of Course/Workshop/ Seminar/ Symposia/Conference	Period
1.	Dr. A Jhunjhunwala and Telemation group	National Conference on Communication	31 Jan-2 Feb '97
2.	Prof. R. Raina Elec. Engg. Dept.,	Photonics-97 International Conference on fibre optics and photonics	Dec. 1996
3.	Dept. of Elec. Engg.	One day workshop on High voltage Engg. in Honor of Prof. Y. Narayana Rao	Aug. 1996

4.7.3.A. . Special Lecture(s) Delivered

S.No.	Name of Faculty	Topic of Lecture	Place and Date
1.	V.V. Sastry	Digital Simulation of Power Electronic Circuits	Mysore, Coimbatore,
2.	Mukunda Rao	Optical communication Computer Aided non invasive diagnostic	S.K. University, Anantapur
3.	K.N. Bhat	Micro Machining for Micro sensors and actuators	3 days Seminar on Muhatra sensors and actuators KREC, Surathkal, March 97
4.		Effects of High energy Electron Irradiation on International conference on "R&D using electron accelerators	Mangalore University Jan. '97
5.	K.Srinivasan	Keenote address on "Image Compression echniques for multimedia Application	Annamalai Univ. March '97
6.	A. Das Gupta	Anurag, DRDO	Sep. '96
7.	Ashok Jhunjhunwala	Expanding Telecom & Information Network in India",	September 1996, Bangalore
8.		Access Network ", Seminar on Telecom In 21 st Century	3rd January 1997, New Delhi
9.		Relevance of Elite Educational 21st century , Institutes in India Seminar on Engineering Education	Jan. 1997, IIT, Madras
10.		Cost Effective Rural Communication System for India, First All people Technology Congress (AIPTC)	January 1997, Calcutta
11.		Towards A Hundred Million Telephones in India, National Conference on Communications (NCC 97), p. 275.	January 31-February 2, IIT, Madras,
12.		Access Networks for India, International Symposium on New Horizons in Communications,,	January 21-22 1997, Bangalore
13.	K. Ramar	Delivered a series of Lectures on 'Power System Voltage Stability'	Gordon Centre for Energy studies Tel Aviv Univ.,Tel Aviv, Israel26.5.96 to 9.6.96
14.		Delivered a Key note address and also presented a paper on Power Systems Simulations In the National Workshop on Energy Management System	Malnad Engg. College, Hassan 20-21 March 1997

4.7.3.5. Visits Abroad

S.No.	Name of Faculty	Country visited	Date	Purpose of visit
1.	Mukund Rao	Sanjose, USA Paris	Feb. 97 Feb.97	To present papers
2.	V.V. Sastry	Tech. Univ.Munich	June '96	Part of the Volkswagen foundation sponsored project for discussion with later attended on IEEE, PESC '96 Conference held at Baveno, Italy before returning to India

4.7.4. Design and Development Activity

4.7.4.1. Instruments/Equipment Designed and Developed

1. Linearizing circuit for thermistor response
2. Novel circuits for impedance measure month
3. Automating the DLTS for MOS devices
4. 4-channel optical sensor recording equipment
5. Fast ethernet switch
6. Video Telephony
7. Cordless EPABX
8. Voice over ethernet

4.7.4.2. New Facilities added and Major Equipments procured

1. Dymo series for object oriented modeling
2. Silicon Graphics Work station added to Microprocessor lab
3. 10 SDK 8086 Kits added
4. Edwards Vacuum coating unit added to Devices lab
5. Computing facility added Photonics

4.7.5. Research and Consultancy

4.7.5.1. Sponsored Projects

Title of the Project	Duration	Sponsoring-Agency	Value of Project in Lakshs	Investigator/ Co-ordinator
Fibre Optics Railway Signalling and Communication System	1993-1997	Dept. of Electronics, New Delhi	Rs. 17	Co-ordinator
FDDI Station Management Protocols	1993-1997	Dept. of Electronics,	Rs. 17	Co-ordinator

Title of the Project	Duration	Sponsoring-Agency	Value of Project in Lakshs	Investigator/ Co-ordinator
& Ethernet Bridge Development of Fibre-optic Sensors for simultaneous measruernent of voltage and current	Two years	New Delhi AICTE N Delhi	9.00	Prof. P. Sankaran Dr. V. Jagadeesh Kumar
Feasibility studies on DSP basic block design	Two years	ISRO	8.00	Mr. H. Renganathan Prof. C. Eswaran Prof. S. Srinivasan
NN-based coding schemes for telemetry data	Two years	ISRO	2.85	Mr. H. Renganathan Prof. C. Eswaran Prof. S. Srinivasan
Expansion of Robotics Laboratory	3 years	AICTE N. Delhi	10.00	Prof. P.A. Janakiraman
Design and Development of Micro-magnetized Silicon Accelerometer	One year	DRDO N. Delhi	24.00	Prof. K.N. Bhat Dr. A. Das Gupta Dr. N. Das Gupta Dr. S. Karmalkar Mr. P.R.S. Rao
Design of Analog and Mixed-mode ASICs and Development of Analog ASIC Design Tools	--	DST N. Delhi	35.59	Prof. S. Srinivasan Dr. Vinita Vasudevan Prof. K.R. Rao Prof. K.N. Bhat Dr. C. Mathiazhagan
Adaptive Moving Target Detection for Radar Signal Processing	3 years	--	9.97	Prof. K.M.M. Prabhu
Analog VLSI Design	3 years	Analog Devices Inc, USA	6.00	Prof. K.R. Rao Dr. Vinita Vasudevan
Study of Si-Ge Alloys	2 years	DST N. Delhi	4.60	Dr. E. Bhattacharya Dr. A. Subrahmanyam
Developmet of Amorphous Silicon Thin Film Transistors	3 years	DST N. Delhi	13.21	Dr. E. Bhattacharya Dr. A. Das Gupta
Development of Bipolar and Prof. MOS Device Simulator		DOE N. Delhi	21.15	Dr. A. Das Gupta K.N. Bhat Dr. N. Das Gupta Mr. P.R.S. Rao

Title of the Project	Duration	Sponsoring-Agency	Value of Project In Lakshs	Investigator/ Co-ordinator
Design of Accelerometer	18 months	DRDO	17.25	Dr. R.K. Rao Dr. K.N. Bhat
Studies on Neurologically induced Skin Perfusion changes using optical sensors	--	Indo German Project	DM 15,000	M. Mukund Rao

4.7.5.2. Industrial Consultancy

S.No.	Title	Year	Sponsor	Amount (Rs.in lakhs)	Coordinator
1.	Common Effluent Treatment Plant	-	Pollution Control Board TN Govt.	600.00 (approx)	Y.N. Rao & K.Ramar(Joint project with Depts of Civil, Chemical & Mech. Eng.
2.	WILL System	1996-97	Analog Devices	\$400,000	C.Mathiazhagan A.Jhun Jhunwala B.Ramamurthy
3.	Building Automation System	-	Alacrity Electronics Electronics Limited	-	-do-
4.	Resonant Converter for power UPS Design	-		0.50	V.V. Sastry
5.	RF Transistor	6 months	Analysis and Design	1.71	K.N. Bhat Karmalkar
6.	BSF Solar Cell			2.00	Karmalkar
7.	Instrument transformer Testing and certificate	-	-	-	Jagadeesh Kumar Sankaran
8.	Power Quality Issues in a substation layout having Power Electronic Loads"	Jan. '97	SPB Projects & Consultancy Ltd., Perungudi Ltd., Perungud Madras 96	0.50	V.V. Sastry R.K. Thirumala M. Krishnamurthy
9.	Design and Development of a		Tetra Controls Pvt. Ltd.Palavallam Madras	0.50	V.V. Sastry V.R. Durgesh

S.No.	Title	Year	Sponsor	Amount (Rs.in lakhs)	Coordinator
	Resonant Converterwith high frequency Transformer Isolation & Unity Power Factor		41		

4.7.5.5. Research Publications

(a) Papers published in Journals:

1. Prabhu, N. Anupindi and R. Shanmuga Sundaram, "Generalized pruning at the input of radix-2 DIF FHT Algorithm", Singal Processing, Vol.51, No.3, pp. 215-221, June 1996.
2. Prabhu and R. Shanmuga Sundaram, "Some Results on Fixed-Point Error Analysis of Wigner-Ville distribution", Singal Processing, Vol.51, No.3, pp.235-240, June1996.
3. Prabhu and Shanmuga Sundaram, "Fast Hartley Transformer Implementation on DSP chips", Microprocessors & Microsystems, Vol.20, No.4, pp.233-240, June 1996.
4. Chandran and K.M.M. Prabhu, "Computation of DWT via FHT-Based Implementation", Electronics Letters, Vol.32, No.16, 1st Aug. 1996, pp.1437-1438.
5. Prabhu and r. Shanmuga Sundaram "Fast Algorithm for Pseudo Discrete Wigner-Ville Distribution Using Moving Discrete Hartley Transform, "IEE Proc. Vis. Image signal Process, Vol.143, No.6, pp.383-386, Dec.1996.
6. Shanmuga Sundaram and K.M.M. Prabhu, "Numerically Stable Algorithm for Computing Wigner-ville Distribution, IEE Proc. Vis. Image Signal Process, Vol.144, No.1, pp.46-48, Feb.1997.
7. Devnath, K.N. Bhat and P.R.S. Rao, "Stable In P MIS Device using Silicon Nitride/Anodic Oxide Double-layer dielectric", IEEE Electron Device Leters, March, 1997, PP. 4-6.
8. Chatterjee, K.N. Bhat and P.R.S. Rao, "The Effect of a Cap layer on the Diffusion of Zinc from Doped Silico films in Gallium Arsenide", Solid State Electronics, March, 1997, pp.496-500.
9. Rao, K. Remashan, K.R. Suryaprasad, K.N. Bhat and K.S. Chari, "Optimization of PECVD Silicon Oxynitride for silicon MIS Devices with Low Interface State Density", Solid State Electronics December, 1996, pp. 1808-1810.
10. Remashan and K.N. Bhat, "Silicon Nitride $(NH_4)_2S_x$ passivation of n-Ga As to unpin the Fermi-level", Electronics Letters (U.K.), Vol.32, 28th March, 1996, pp.694-695.
11. Bhat, M.C. Ramesh, P.R.S. Rao, and B. Ganesh, "Polysilicon technology", Journal of IETE Special Issue of Technical Review on "Materials for Electronics", Vol.1, No.3, 1997.
12. Bhat, "Recent Advances in Ga As and InP MISFET's", Special Issue of IETE Technical Review on "Microwave and MM Waves Devices", Vol.14, No.3, 19973.
13. Vijaya krishna Prasad, S.Srinivasan and K.M. Patil, "A New DSP-Based Multichannel EMG Acquisition and Analysis System, " Computer and Biomedical Research, Vol.29. pp.395-406, 1996.

- Smart Materials, Structures and MEMS, held at the Indian Institute of Science, Bangalore, Dec. 11-14, 1996.
6. Bhat, "Benefits of Producing Thin Films and Crystals in Space", (Invited Talk) Proceedings of the Symposium on "Low cost Access to Space", held at ISRO, pp.73-91, Bangalore, september 6-7, 1996.
 7. Tilak and K.N. Bhat, "Effect of Poly Thickness on the Performance of Polyemitter Solar Cells", Proceedings of the Symposium on current status on Solar Energy Materials and Systems. held at Anna University; Madras, February 24-25, 1997, pp.33-34.
 8. Rangarajan and S. Srinivasan, "Fast Progressive Image Transmission by Successive Pruning", Proceedings of the National Conference on Communications, Madras, Jan-Feb. 1997.
 9. Srivaths and S. Srinivasan, "Content Based Image Retrieval", Proceedings of the International Conference on Multimedia Technology and Management, Hong Kong, Dec. 1996.
 10. Anand Rangarajan and S. Srinivasan, "Personalized Trailer Making of MPEG Sequences", Proceedings of the International conference on Multimedia Technology and Management, Hong Kong, Dec. 1996.
 11. Nagaraj, S. Srinivasan and S. Radha Krishnan, "Spectral Estimation of Brainstem Auditory Evoked Responses by Autoregressive Modelling", Proceedings of the International Conference on Biomedical Engineering, Coimbatore, Dec. 1996 Chaired Sessions in Photonics - 96.2
 12. Aravind and G.V. Ajay Chanda, "*System layer coding in the MPEG-1 standard*", Proceedings of the Third National Conference on Communications and Networking, National Conference on Communications 1997, January 31-February 2, p.37
 13. Mammen and Bhaskar Ramamurthi, "*PE-LPC: A Variable Bitrate Speech coder*" Proceedings of the Third National Conference on communications and Networking, National Conference on Communications 1997, January 31-February 2. p.51.
 14. Vasudevan, K. Giridhar and Bhaskar Ramamurthi, "*Nyquist-Rate Detection of CPM Signals Using the Viterbi Algorithm*", Proceedings of the Third National Conference on Communications and Networking, National Conference on Communications 1997, January 31-February 2, p.85.
 15. Abhay Joshi and Bhaskar Ramamurthi, "*Adaptive Data Detection of ISI Channels*" Proceedings of the Third National Conference on Communications and Networking, National Conference on Communications 1997, January 31-February 2 p.191.
 16. Vasudev Nambakkama, Bhaskar Ramamurthi, and Devendra Jalihal, "*Statistical Multiplexing with Variable Rate Embedded Coding for Voice Circuit Multiplication*", Proceedings of the third National Conference on Communications and Networking, National Conference on Communications 1997, January 31 - February 2, p. 208.
 17. Joseph Reddy, M.A. Aziz Ahmedwazzu, and C. Mathiazhagan, "*A Low Cost Cordless EPABX Solution*", Proceedings of the Third National Conference on Communications and Networking, National Conference on Communications 1997, January 31-February 2, p.223.
 18. Elwin Stelizer, Ashok Jhunjunwala, R. Lakshmi Narasimhan, Timothy A. Gonsalves, and D.N. Rajan, "Computer Telephony Integration", Proceedings of the Third National Conference on Communications and Networking, National Conference on Communications 1997, January 31-February 2, p.240.
 19. Rolland J. Enoch, N.p. Manoj, c. Sanjay, Umesh sirsiwal, J. Sowdhamini, and Ashok Jhunjunwala "NovaSwitchTM-A Large High Performance Ethernet Switch", Proceedings of the Third National Conference on communications and Networking, National Conference on Communications 1997, January 31-February 2, p.247.

20. Ravichandran, Maneesh Bomb, Rolland J. Enoch, and Timothy A. Gonsolves, "A Family of Low-Cost Ethernet Switches", Proceedings of the Third National Conference on Communications and Networking, National Conference on Communications 1997, January - 31 - February 2 p. 256.
21. Bhattachariya, P. Ramesh and N. Das Gupta, "Effect of Hydrogen plasma on Porous Silicon", Photonics 96, Proceedings of the International Conference on Fibre Optics and Photonics.
22. Das Gupta and G.B. Srinivasa Murthy, "A study of Gate Length, Channel length and Gate source on the GaAs MESFET Characteristics", 3rd International Conference on Semiconductor Materials and Technology New Delhi, 1996.
23. Pavan Kumar and A. Das Gupta, "Influence of Emitter-Base Junction Displacement on the bond Structure in Hetero Junction bipolar Transistor", 3rd International Conference on Semiconductor Materials and Technology New Delhi, 1996.
24. Mukuntha Rao, V. Blazek and H. J. Schmitt, "Real time Detection of Brain Events Using Optical Sensors: Preliminary Results", CNVD 95, VDI No 221. 15 November 1996.
25. Mukuntha Rao, V. Blazek and H. J. Schmitt, "Investigations on the Influence of breathing on Brain Activity Using Optical Sensors", Proceedings of International Conference of SPIE-BIOS 97.
26. Raja, S.S Venkata and V.V. Sastry "A decoupled series compensator for voltage regulation and Harmonic compensation" IEEE Power Electronics Specialists Conference, (PESC) June 1996, Baveno, Italy, pp. 527-531.
27. Jayaprakash, t.V. Sivakumar and V.V. Sastry "Object-Oriented modelling, Simulation and optimisation of Power Electronic Circuits", IEEE PESC, 96, Baveno, Italy June, pp. 581-588.
28. Sastry, T.M. Rangarajan and T.V. Sivakumar, "A PC based object oriented modelling and simulation of Power Electronics Systems" National Symposium on Power System Instrumentation and Control, CPRI, Bangalore, December 26-27, 1996, pp. 217-223.
29. Sastry "Object-Oriented modelling and Design of Engineering Systems", National Seminar on Engineering Education for 21 st century, Indian National Academy of Engineering, Madras, January 17-19, pp.24-32.
30. Jankiraman and Abhijit Bhattacharya, "A new procedure for Parameter Estimation by Exciting Limit Cycles of specified periods" in International Journal of Adaptive Control and signal Processings, Vol 2, pp. 101-113, 1997.
31. Farokhrooz F.N., H.A. Tafti and J.P. Raina (1996) Design considerations in synchronous detection schemes in the presence of optical amplifiers. (Invited paper), being published in the Proceedings of SPIE's Aerosense '1996 Conference Orlando, USA, April 8-12.
32. Farokhrooz F.N., H.A. Tafti and J.P. Raina (1996) Impact of laser phase noise on multiple optical amplifier based binary and M-ary synchronous PSK coherent optical systems. Accepted for presentation at the International Conference on applications of Photonics, Montreal, Canada, July 29-Aug1.
33. Farokhrooz F.N., and J.P. Raina (1996) Laser phase noise effects in multilevel signalling schemes using cascaded optical amplifiers. Accepted for presentation at the International conference on Photonics, IIT Madras, India, Dec.9-13.
34. Nair, P, B.M. Sivaram, J.P. Sivaram, J.P. Raina, (1996), "Experimental and theoretical studies of gain of EDFA's with pump excited state absorption and signal upconversion losses under co and contradirectional pumping", Proc. SPIE, 2695, 149-155.

35. Venkataseshaiah, R. Sarathi and M/V. Aleyas, Studies on the dielectric strength of transformer oil under oscillatory impulse voltages, 1996 International Symposium on Electrical Insulation, Montreal, Canada.
36. Sarathi, Dynamical aspects of electrodeposition, National conference on fundamentals of crystal growth, karaikudi, 1997.
37. Yegnanarayanan and g. Sridhar Rao Induction machine with the generalised unsymmetrical 3 phase stator winding for use as an arno-converter with controllable unbalanced voltage characteristics, 9 th national conference Dec' 96, 291-296.

4.7.6. Distinguished Visitors to the Department

Sl.No.	Name of the Visitor and Occupation	Date of visit	Purpose of visit (Lecture/Discussion)
1.	Dr. V.C. Pratapa Reddy Rochester Institute of Technology	Dec.'95-May '96	Visiting Professor
2.	Prof. A. Avatar Singh Sanjose State University	1.8.96 to 30.10.96	Lecture
3.	Peter O. Louritzen Univ. of Washington, USA	-	Lecture
4.	Thomas Alexander Bit Corp, USA	-	Lecture
5.	Keerthi Aravind Univ. of California Santa Barbara	-	Lecture
6.	Nitin Jain MACOM, USA	-	Lecture
7.	David Koil Pillai Ericsson, USA	-	Lecture
8.	H.J. Schmitt Tech. Univ. of Aachen, Germany	-	Lecture
9.	J. Holtz Univ. of Wuppertal AEG, Frankfurt	-	Lecture

4.8 Humanities and Social Sciences Department

4.8.1 Introduction

The Department of Humanities and Social Sciences was established in 1959. Ph.D., M.S., and M.Tech. programmes are being offered. The major areas of teaching and research of the Department are :

- * Undergraduate courses in Humanities and Social Sciences.
- * M.Tech. courses in Industrial Management
- * Programme in Operations Management, Applied Decision Analysis, Materials Management, systems Analysis and Modelling, Financial Management, Business Policy/Strategic Management, Marketing Management, Organisational Behaviour, Personnel Management and Industrial Relations, Technology Management, Science and Technology Policy Studies.

Ph.D Programme in New Literatures in English, Linguistics, Teaching of English as a Second Language (TESL), German Literature, Modern Indian History, Socio-Economic Cultural Developments, Applied Economics, Psychology, Marketing Management, Organisational Behaviour, Personnel Management and Industrial Relations, Financial Management, Business Policy/Strategic Management, Applied Decision Analysis, System Analysis and Modelling, Operations Management, Technology Management and Science and Technology Policy Studies.

4.8.2 New Courses Introduced:

The following New Courses were introduced during the period under report.

S.No	Course No.	Title	Faculty
1.	HS 404	Communication and Discourse Strategies	R G Koeckritz T J Kamalanabhan
2.	HS 615	Organisational Decision Making	R G Koeckritz L S Ganesh

4.8.3 Details of Faculty:

Name & Qualification	Major area of Specialisation
Professors	
R.N. Anantharaman, Ph.D.(Bangalore)(on EOL)	Organisation and Consumer Behaviour, Social Psychology, Psycholinguistics
S.C. Chaudhary, Ph.D.(CIEFL Hyderabad)	Theoretical Linguistics, ELT Need Based Courses in English.
L.S. Ganesh, Ph.D.(IIT Madras)	Technology Forecasting, Multicriteria Decisions, Project Management and Applied Systems Analysis.
T.T. Narendran, Ph.D.(IIT Madras)	Operations Management, Decision Support Systems, Group Technology

Name & Qualification	Major area of Specialisation
R.Rajagopalan, Ph.D.(IIT Kanpur)(on EOL)	Production Management, Group Technology, Science and Technology Policy, German
C. Ramachandran, Ph.D.(IIT Madras)	Modern Indian History, Labour History.
L.V.L.N. Sarma, Ph.D.(IISc)[Head]	Financial Management, Business Policy & Corporate Strategies.
Associate Professors	
(Mrs)Elizabeth Nainan Kurian, Ph.D.(IIT Madras)(on EOL)	American Fiction
(Ms)Evangeline Manickam, Ph.D.(Madras)	Americal Literature, English, French
S. Jayachandran, Ph.D.(IIT Madras)	Marketing Management
(Mrs) Malathy Duraisamy, Ph.D.(Madras)	Applied Economics/Econometrics, Labour Economics, Economics of Science and Technology.
V.R. Muraleedharan, Ph.D.(IIT Madras)	Health Economics, Public Policy, History of Healthcare in South India
C. Rajendran, Ph.D.(IIT Madras)	Production Management, Scheduling, Computer Simulation.
B. Subramanian, Ph.D.(Karnataka)	German and Philosophy
Assistant Professors	
M. Durgaprasada Rao, M.B.A(Andhra)	Management Accounts, General Management.
T.J. Kamalanabhan, Ph.D.(Madras)	Industrial Psychology, Organisational Behaviour.
S. Mohan, M.A.(Madras)	English, Science Fiction & Indian Fiction in English
G. Srinivasan, Ph.D.(IIT Madras) (on EOL)	Group Technology, Production Management, Operations Research.
D.Veeraraghavan, Ph.D.(IIT Madras)	Social and Economic History, Labour Movements.
DAAD Visiting Faculty	
R.G. Koeckritz	German, Communication Strategies
Visiting Faculty	
(Mrs) Zoya Abraham	German Language Teaching
Dr (Mrs) Devaki Reddy	English
Dr (Mrs) V. Padma	English

Name & Qualification	Major area of Specialisation
Dr (Mrs) R Rukmani	Economics
Mr Subbalaah Arunachalam	Management

4.8.4 Students on Roll:

Programme	I Year	II Year	III Year	IV Year	V Year	Total
Ph.D.	3	5	6	5	6	25
M.S.	5	2	1	1	-	9
M.Tech.	19	23	-	-	-	42
Total	27	30	7	6	6	76

4.8.5 Number of Scholarships/Fellowships holders:

Programme	Institute	CSIR	Others	Total
Ph.D	10	1,3(QIP)	7 (Ext)	21
M.S.	9	-	1 (Ext)	10
M.Tech.	38		3(SPON)	41
Total	57	4	11	72

4.8.6 Number of Degrees Awarded:

Programme	Number
Ph.D	5
M.S.	5
M.Tech.	23
Total	33

4.8.7 New Facilities added and Major Equipment procured:

INTERNET Facility provided In the Systems Laboratory

4.8.8 Short-term Courses/Workshops/Seminars/Symposia/Conference organised:

S.No.	Co-ordinator(s)	Title of Course/Workshop/Seminar/Symposia/Conference	Period
1.	Dr S C Chaudhary	"Role of English Language & Literature In Nation Building"	26 Sept'96
2.	Mr M Durgaprasada Rao Dr T J Kamalanabhan	SMALL INDUSTRIES MANAGEMENT ASSISTANT PROGRAMME	June-Aug'96
3.	Mr M Durgaprasada Rao Dr T J Kamalanabhan	SWIL-Executive Development Programme	6&7 July'96

4.	Mr M Durgaprasada Rao Dr L S Ganesh	Industrial Projects for Canara Bank Officers	November'96
5.	Dr L S Ganesh	Awareness Programme on "INTELLECTUAL PROPERTY RIGHTS"	October'96

4.8.9 Short term Courses/Workshops/Seminars/Symposia/Conferences/Training attended by the Faculty in recognised Academic Institutions and Public Sectors:

S.No.	Name of Faculty	Title	Period/Duration
1.	Dr B Subramaniam	International Symposium of Cultural Delimitations, JNU, New Delhi	Feb 16-19, 1997
		National Conference on Indian Modernities, CIEFL Hyderabad	Feb 25-27, 19'97
2.	Dr L V L N Sarma	Liberalisation and Financial Services - National Seminar, Ambedkar Univ. Hyderabad - Chaired a Tech. Session on "Liberalisation and Financial Services" and acted as an expert and presented the principle theme paper	Mar. 15-16,1997
3.	Dr Evangeline Manickam	7th International Conference on Humour Studies Research, Univ. of New South Wales, Sydney, Australia	July 7-12, 1996
		6th Annual Conference of the Mark Twain Society of India, Annamalai Univ. Study Centre	Nov 29-30, 1996
4.	Dr D Malathy	Elementary Education in India	3 days

4.8.10 Invited Lectures Delivered by the Faculty in Academic Institutions/Public Bodies:

S.No.	Name of the Faculty	Topic of the Lecture	Delivered at	Date
1.	Dr S C Chaudhary	How English came to India	Academic Staff College Univ. of Madras	8-8-1996
2.	Dr L V L N Sarma	Capital Asset Pricing Models	Academic Staff College Bharathiar Univ. Coimbatore	June 29-30 1997
		"Portfolio Theory" IFMR	IFMR Madras	Oct 6-7 1996
		Significant Contributions in the Theory of Finance	Academic Staff College Univ. of Madras	22-2-1997

S.No.	Name of the Faculty	Topic of the Lecture	Delivered at	Date
3.	Dr B Subramaniam	Rhetorik Conka Linguistik Rhetorische Strategien im FSU Interkulturelles Verstehen als dvachronische Perspective The Political Implications in Economies 'Name of the Rose'	CIEFL Hyderabad -do- -do- CIEFL UGC Lecture	Sept. 1996 Feb. 1997
4.	Mr M D P Rao	Principles of Management	Regional Labour Institute Madras	Feb. 1997
5.	Dr T T Narendran	Technological Changes and Developments that are Emerging and their impact on Organisations & Managers	Kautila Mgmt. & Technical Services Tiruvananthapuram	Nov. 1996
	Dr T T Narendran	Seminar on "Challenges to the 21st Century Manager" Window to Flexible Manu- facturing at a Seminar on 'Challenges of Manage-ment beyond 2000 A.D.'	-do- Palghat Management Association	Dec. 1996
6.	Dr Evangeline Manickam	English for Technical Writing	MNM Jain Engg. College Madras	Jan 1997
7.	T J Kamalanabhan	Human Resource Management Time Management	Indian Airlines Regn. Trg. Institute	Jan. 1997 April 1997

4.8.11 Distinguished Visitors to the Department:

S.No.	Name of the Visitor and Occupation	Date of Visit	Purpose of Visit
1.	Prof Chaman Nahal Distinguished Professor of English Mr Jasper Utley - British Author Shree Ashokamitran - Tamil Writer	Sept'96	A.V.Krishna Rao Memorial Symposium
2.	Prof J Satyanarayana, Hyderabad	25.02.97	Lecture
3.	Prof U. Shankar Director, Madras School of Economics, Chennai	11.03.97	Lecturer
4.	Dr. S. Ramani Vice Chancellor Sri Chandrasekharandra Saraswathi Vishwa Maha Vidyalaya, Kancheepuram	21.03.97	Lecture
5.	Mr G C Doctor General Manager Syscon Business Systems Madras	26.03.97	Lecture

4.8.12 Memberships/Fellowships in Professional Bodies:

S.No.	Name of the Faculty	Organisation
1.	Dr S C Chaudhary	Elected to the Special Interest Group "Global Issues" of the IATEFL, U.K.
2.	Dr B Subramaniam	Designated Editor of "Jahrbuch Germanistik In Indien" by DAAD - Experts Committee on German Studies, Nov. 1996.
3.	Dr L S Ganesh	Member In the Executive Committee of "National Society of Technology Managers", Nominated in 1996.
4.	Dr Evangeline Manickam	Executive Member, Board of Mgmt, Fulbright Alumni Association, Madras, 1997-98. Editorial Board Editorial Board, City Academy, Literary Journal Published by Madras University, Annamalai Univ.and Pachaiyappas College Madrass.
5.	Dr T J Kamalanabhan	Life Member in Indian Academy of Applied Psychology and Member in Madras Psychology Society
6.	Dr D Malathy	Member in Indian Econometric Society and Indian Society for Labour Economics

4.8.13 Sponsored Projects:

S.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Co-ordinator(s)
1.	CCE (SIDBI-SIMAP)	April 1997	SIDBI	20.00	T J Kamalanabhan M Durgaprasada Rao
2.	Role of Govt. In The London Adjusting Economies: School of Health Sector, India Case Study	Jan-July 1997	The London School of Hygiene & Tropical Med.	1.80	V R Muraleedharan

4.8.14 Books:

Name	Title	Publisher
S Jayachandran and R N Anantharaman	A Chapter in a book by "Inter-group Conflict in the Purchasing Decision-Making Process A Conflict Oriented Approach to Organisational Buying Behaviour"	Marketing Management, pp.22-34, (1996).

4.8.15 Visits Abroad by Faculty:

S.No.	Name of Faculty	Country Visited	Date	Purpose of Visit
1.	Dr S C Chaudhary	Keele, U.K.	April 96	To present paper at IATEFL Conference
2.	Dr C Rajendran	Germany, England Netherlands	Feb. 96 to Mar.97	On Alexander Von Humboldt Research Fellowship
3.	Dr Evangeline Manickam	Australia and Singapore	July 96	To present paper Conferences
4.	Dr T J Kamalanabhan	Canada USA	July 96 Aug.96	To present paper at Conferences

4.8.16 Industrial Consultancy (only ongoing):

S.No.	Title	Organisation	Amount	Co-ordinator(s)
1.	Analysis of business projections	SPIC JEL Eng.Constrn. Ltd.	20.00	L.S. Ganesh M.D.P. Rao
2.	Productivity Analysis	NF Pvt. Ltd.	30.00	L S Ganesh T T Narendran
3.	Competition, Incent.& Structure of private hospital market in Urban India: A Study of Madras City	ABT Associates Inc./US AID	Rs.7.0 lakhs	V R Muraleedharan D Veeraraghavan
4.	"Role of Government in Adjusting Economies: Health Sector, India Case Study"	London School of Hygiene & Tropical Medicine	Rs.1.8 lakhs	V R Muraleedharan
5.	RBIC for development of a Statistical package for fitting distributions and for generating random variates	CASSA,DRDO Bangalore	-	G Srinivasan T T Narendran

4.8.17 Research Publications:

a. Papers Published In Journals

1. S.C.Chaudhary, "Materials for Teaching Spoken English", The Journal of English Language Teaching, Vol.XXXI XIO-1 Jan-Feb 1965, pp.15-33.
2. S.C.Chaudhary, "Do Humanities and Social Sciences Have a Chance in Modern India?", University News, Vol.34, No.28, Jan 8, 1996, pp.4-6.
3. S.C.Chaudhary, "What Grammar Shall We Teach?", English Association Journal, Vol.8, Summer 1994-96, pp.189-207.

4. Sridhar J and Rajendran C, "Scheduling in Flowshop and Cellular Manufacturing System with Multiple Objectives - A genetic Algorithmic Approach", *Production Planning and Control*, Vol.7, No.4, 374-382 (1996).
5. Shaṛada Priyaclārshini B and Rajendran C, "Formulations and Heuristics for Scheduling in Buffer-constrained Flowshop and Flowline based Manufacturing Cell with different Buffer-space requirements for jobs: Part 1". *International Journal of Production Research*, Vol.34, No.12, 3465-3485 (1996).
6. N Vinod Kumar and L S Ganesh, "An empirical analysis of the use of the Analytic Hierarchy Process for estimating membership values in a fuzzy set" *Fuzzy Sets and Systems*, Vol.82, pp.1-16. (1996).
7. N Vinod Kumar and L S Ganesh " A Simulation-based evaluation of the approximate and the exact eigenvector methods employed in AHP". *European Journal of Operational Research*, Vol.95, pp.656-662 (1996).
8. Evangeline Manickam and Latha Rengachari, "Movement in Time and Place: The Work of Meera Alexander A comment" *Kavya Bharathi*, Vol.7,(1996).
9. Paul Pratap Jayaraj and T J Kamalanabhan, "Factors Impeding Trade Union Activities in Anglo-French Textiles Company, *Journal of Psychology*., Vol.9, No.1, pp.1-5 (1996).
10. Duralsamy P and D Malathy, "Substitutability Between Education and Experience in the India Labour Markets," *Journal of Educational Planning and Administration*, Vol.10, No.3, pp.271-278, (1996).
11. Malathy D Book Review: "The Great Transformation in Higher Education 1960-1980" by Clark Kerr(New York: State Univ. of New York Press), *Journal of Educational Planning and Administration*, Vol.10, No.2, pp212-214 (1996)
12. Malathy D and P Duralsamy, "Sex Discrimination in Indian Labour Markets," *Feminist Economics*, Vol.2, No.2, pp.42-61, (1996).
13. V Sudhir and V R Muraleedharan and G Srinivasan, "Integrated Solid Waste Management in Urban India: a critical operational research framework", *Socio-Economic Planning Sciences*, Vol.30, No.3, (1996).
14. Jayakrishnan Nair G and Narendran T T, "Grouping Index: a new quantitative criteria for goodness of block-diagonal forms in group technology", *International Journal of Production Research*, Vol 34, No.10, 2767-2782, (1996).
15. Jayakrishnan Nair G and Narendran T T, "Cluster Goodness: A New Measure of Performance for Cluster Formation in the Design of Cellular Manufacturing Systems", *International Journal of Production Economics*, Vol.43, 1-13, (1996)
16. Rajkumar, K and Narendran T T, "A Heuristic for Sequencing PCBs with due-dates", *International Journal of Production Management*, Vol.17, 5th Issue, (1997).
17. Subramaniam B, *Der Weg Zur Innigkeit*. In: *Indien In der Gegenwart*, 1/2, Dec, (1996).

Papers Presented In Conferences/Symposia

1. L.V.L.N.Sarma, "Conference Issue of National Seminar on Financial Services", National Conference at Dr B.R.Ambedkar Open University, Hyderabad on 15-16 March 1997.
2. S.C.Chaudhary, "Test in Spoken English", paper presented at 30th International Conference of IATEFL at Keele University, 8-12 April, 1996, Abstract on P.36 of the Proceedings.

3. Suman Kalyan and L S Ganesh "Two simple methods for identification of ARIMA models" International conference on Computers and Industrial Engineering; Korea, 1996.
4. G N Mohan Babu and L S Ganesh "A framework for understanding the dynamics of technological changes in developing countries". International conference on Operational and Quantitative anagement, Jaipur, 1997
5. Evangeline Manickam, "The Mind of the Migrant: Immigrant Humour In Salman Rushdie's East-West", 7th International Conference on Humour Studies Research, UNSW, Sydney, July 7-12, 1997.
6. Evangeline Manickam and Latha Rengachari, "Where History, Memory and Politics Converge: Reading Sara Suleri's Heatless Days as Post-Doctoral Feminist Autobiography." National Seminar on Configurations of Culture, Post-Coloniality and Nationalism in Literature In English" Feb, 4-6, 1997.
7. V Vijaya and T J Kamalanabhan, "Environmental concerns of Technology and Non Technology students Journal of Psychological researches, Vol.42, Jan. 1997 issue.
8. Malathy D, "Women's Status and Fertility in Urban Tamil Nadu" Paper presented at the India and South Asia Conference of the Economic Society, at New Delhi, Dec. 28-30, 1996.
9. Bhaskara Reddy, S.V. Shanmugam, M.S. and Narendran T T, "An Object Oriented Methodology for Feature Based Process Planning System", Proceedings of the 17th AIMTDR, January 9-11, REC-Warangal, 1997.

4.8.18 Any other Relevant Details:

1. The Department of Humanities and Social Sciences arranged on the eve of Budget'97 a Panel Discussion on "Indian Economy Today: A Post-budget Analysis" on 10.03.97. The Panelists were Mr N Kumar, Mr T Premkumar, Mr N Ravi and Dr U Shankar.
2. The Humanities and Social Sciences Department has established a Technical Communication and Editing Cell.

4.9. Mathematics Department

4.9.1 Introduction

The Department of Mathematics was established in 1959 along with the Institute. It offers both Ph.D and M.Sc. programmes in Mathematics. In addition, the department has taken the responsibility of teaching Mathematics courses to B.Tech., M.Tech., and Ph.D students of the Institute. The major areas of research of the department are:

1. Algebra and its Application
2. Applied Probability
3. Approximation Theory
4. Computational Fluid Mechanics
5. Continuum Mechanics
6. Coding Theory
7. Fluid Mechanics
8. Functional Analysis
9. Functional Differential Equations
10. Fuzzy Sets and Systems
11. Graph Theory and Combinatorics
12. Mathematical Logic & Applications
13. Mathematical Modelling
14. Numerical Analysis
15. Operations Research
16. Operator Theory
17. Statistical Quality Control
18. Stochastic Process and their applications
19. Theoretical Computer Science
20. Theoretical Physics

4.9.2. New Courses Introduced:

The following new courses were introduced during the period under report.

S.No.	Course No.	Title	Faculty
1.	MA 741	Mathematical Logic and Applications	Dr.A. Singh Prof.P.V.Subrahmanyam

S.No.	Course No.	Title	Faculty
2.	MA 757	Operator Theory	Dr.M.T. Nair
3.	MA 742	Formal Language Theory	Dr.R. Rama Dr.A. Singh
4.	MA 820	ODE's and PDE's	Dr.D. Bahuguna Dr.R. Usha

4.9.3 New facilities introduced:

1. Internet
2. Addition of Computers to Labs

4.9.4. Details of Faculty:

Name and Qualifications	Specialisation
Professors	
A. Avudainayagam, Ph.D.(IIT Madras)	Fluid Mechanics, Suspension Rheology, Polar Fluids, Low Reynolds number flows
P.Bhattacharyya, Ph.D.(London)	Complex analysis, Theory of Splines, Lacunary Interpolation, Approximation Theory.
(Mrs.)S.Kalpukam, Ph.D.(IIT Madras)	Applied Probability and Stochastic Processes, Operations Research.
S.H.Kulkarni, Ph.D.(IIT Bombay)	Functional Analysis, Numerical Analysis.
S.N.Majhi, Ph.D.(IIT Madras)	Fluid Mechanics, Bio-Fluid Mechanics, Mathematical Modelling.
P.R.Parthasarathy, Ph.D.(Annamalai)[Head]	Applied Probability and Statistic Models, Mathematical Ecology, Operations Research, Statistical Inference.
H.S.Paul, Ph.D.(IIT Kanpur)	Elasticity, Piezoelectricity Wave propagation, Bio-medical Engineering.
C.V.Raghava Rao, Ph.D.(IIT Madras)	Fluid Mechanics, Numerical Methods in Fluid Mechanics.
U.N.Srivastava, Ph.D.(IIT Madras)	Applied Mathematics, Differential Equations, Continuum Mechanics, Singular Perturbation Problems, Boundary Layer Theory, Differential inequalities, Mathematical Ecology, Dynamical Systems.
V.Subba Rao, Ph.D.(IIT Kharagpur)	Numerical Analysis, Approximation Theory, Computational Fluid Dynamics.

Name and Qualifications	Specialisation
P.V.Subrahmanyam, Ph.D.(IIT Madras)	Fixed Point Theory/Analysis.
R.Subramanian, Ph.D.(IIT Madras)	Applied Probability, Application of Stochastic Processes.
S.N.Venkataraman, Ph.D.(IIT Madras)	Fluid Mechanics, Variational Principles, Pade' Approximation, Decomposition Methods.
Associate Professors	
S.A.Choudum, Ph.D.(IIT Madras)	Graph Theory, Combinatorics.
S.G.Kamath, Ph.D.(DELHI)	Theoretical Physics, Elementary particle Physics.
M.T.Nair, Ph.D.(IIT Bombay)	Functional Analysis, Linear Operator Equations.
A.Rangan, Ph.D.(IIT Madras)	Probability Theory, Stochastic Processes, Operations Research Applications to Biological Sciences, Neural Methods, Inventory Controls, Ecology Reliability.
(Mrs.)R.Usha, Ph.D.(IIT Madras)	Fluid Mechanics Bio-fluid Mechanics
P.Veeramani, Ph.D.(IIT Bombay)	Functional Analysis.
Assistant Professors:	
D.Bahuguna, Ph.D.(IIT Kanpur)	Non-Linear Analysis, Differential Equations.
Y.Nagendra, Ph.D.(IIT Kharagpur)	Statistical Quality Control.
(Mrs.)R.Rama, Ph.D.(Anna Univ.)	Theoretical Computer Science, L-Systems, Formal Languages Automata Theory.
A.Singh, Ph.D.(IIT Kanpur)	Numerical Analysis, Mathematical Logic.
(Mrs.)W.B. Vasantha, Ph.D.(Madras)	Algebra, Coding Theory, Fuzzy Sets and Systems, Application of Algebra
Senior Scientific Officer (Gr.I)	
K.Swaminathan, Ph.D.(Agra)	Fluid Dynamics, Ship Hydro-Dynamics, Systems Simulations and Development of Software for Control Systems.

During the year under review, the following faculty members retired on superannuation.

Prof.H.S. Paul

Research Associates

1. Dr. R. Radha, Ph.D. (Madras)
2. Dr. G. Sarada, Ph.D. (IIT., Madras)
3. Dr. S. Sivagurunathan, (Ph.D - IIT, Kanpur)

4.9.5 Students on Roll:

Programme	I Year	II Year	III Year	IV Year	V Year	Total
Ph.D.	5	6	4	4	2	21
M.Sc.	30	22	-	-	-	52
Total	35	28	4	4	2	73

4.9.6. Number of Scholarship holders:

Programme	Institute	Project	Others	Total
Ph.D.	10	2	2	14
M.Sc.	8	-	-	8
Total	18	2	2	22

4.9.7. Number of Degrees Awarded:

Programme	Number Awarded
Ph.D.	6
M.Sc.	26
Total	32

4.9.8. Short-term Courses/Workshops/Seminars/Conferences Organised:

S.No.	Title	Date	Co-ordinator(s)
1.	One Day Symposium on Mathematical Methods and Applications (Conference)	22.12.96	Dr. S.G.Kamath Prof. S. N. Majhi
2.	FORAYS '97	22-23.2.97	Dr. M.T. Nair
3.	A short term QIP program on Essential Maths for Engineers	6-10.1.97	Dr.(Mrs.)W.B.Vasantha

4.9.9. Short term courses/workshops/conferences attended by the faculty.

S.No.	Name of the faculty	Title	Period
1.	Prof.S.Kalpakam	International Conference on stochastic Processes,Cochin	26-29 Dec.1996
2.	Prof.S.H.Kulkarni	Research Seminar in honor of Prof.Vasavade, S.P.Univ., Vallabh Vidya Nagar	14-15 Sept.1996

S.No.	Name of the faculty	Title	Period
3.	Prof.P.R.Parthasarathy	Third workshop on Mathematical Ecology, ICTP, Italy	14 Oct.-1 Nov.1996
4.	Prof.P.R.Parthasarathy	Seminar on statistics in Ecological & Environmental studies, Calcutta	24 Dec. 1996
5.	Prof.P.R.Parthasarathy	Indian Science Congress, Delhi	3-8 Jan.1997.
6.	Prof.P.R.Parthasarathy	International Workshop on Special Functions and Differential Equations, Inst.of Mathematical Sciences, Madras	13-14 Jan.1997
7.	Dr.R.Rama	National Workshop on Graph Theory & its applications, M.S.Univ. Tirunelveli	1996
8.	Dr.R.Rama	National Seminar on Advanced Mathematical Approaches to Problems in Indian Industry, Andhra Univ.	1996
9.	Prof.P.V.Subrahmanyam	Second World Congress of Nonlinear Analysis, Athens	10-17 July 1996
10.	Prof.P.V.Subrahmanyam	IMS,62nd Annual Conference, IIT Kanpur	23-25 Dec. 1996
11.	Prof.R.Subramanian	International Conference on Stochastic Processes, Cochin Univ. of Science & Tech. Cochin	Dec.26-29 1996
12.	Dr.R.Usha	ASME Fluids Engg. Conference,San-Diego, USA	7-11 July 1996
13.	Dr.W.B.Vasantha	One Day Symposium on Mathematical Methods & Applications, IIT Madras	22 Dec.1996.
14.	Dr.W.B.Vasantha	IMS,62nd Annual Conference,IIT Kanpur	23-25 Dec. 1996

4.9.10. Special Lectures Delivered:

S.No.	Name of faculty	Topic of Lecture	Delivered at	Date
1.	Prof.S.H.Kulkarni	Teaching Linear Algebra without using determinants	Anna Univ. Madras	Apr.24 1996
2.	Prof.S.H.Kulkarni	Operators on a quaternionic Hilbert Space	S.P.Univ. Gujarat	Sep.15 1996
3.	Prof.S.H.Kulkarni	Generalised Inverses of matrices and their appl. (2 lectures)	Mareshwade Univ.Aurangabad	Jan.24 1997

S.No.	Name of faculty	Topic of Lecture	Delivered at	Date
4.	Prof.S.H.Kulkarni	Spectrum in a Real Algebra	Marewshwade Univ. Aurangabad	Jan.27 1997
5.	Dr.M.T.Nair	Regularizations with unbounded	Kaiserslautem, Germany	May.23 1996
6.	Prof.P.R.Parthasarathy	Density-dependent Population models	Seminar on Statistics in Ecological and Environmental Studies, Calcutta Statistical Association	Dec.24 1996
7.	Prof.P.R.Parthasarathy	Stochastic models of compartmental systems	84th Indian Science Congress, Delhi Univ.	Jan 3 1997
8.	Prof.P.V.Subrahmantam	An Extremum Problm	Mathematics Association, Vivekananda College	Oct.4 1996
9.	Prof.P.V.Subrahmanyam	Fusion of old and new ideas in Calculus	Annual Conference of AMTI, New Delhi	Dec.27 1996
0.	Prof.P.V.Subrahmanyam	Fuzzy sets	One day Symposium, Queen Mary's College, Madras	1996
11.	Prof.P.V.Subrahmanyam	Facets of Fuzzy Mathematics	National Workshop on Fuzzy Techniques and Appl.Bapuji Inst.of Tech.	Dec.1996
12.	Prof.R.Subramanian	Reliability Eng. (Series of 10 lectures)	Dr.M.G.R. Eng. College	1996
13.	Prof.R.Subramanian	Some famous Problems and paradoxes in Probability	Anna Univ. Madras	Dec.27 1996
14.	Prof.R.Subramanian	What is Operations Research?	Annual Inter-Collegiate Students Symposium, REC, Tiruchi, Mar.24 1997	
15.	Dr.P.Veeramani	Fuzzy sets & their Appl.	Two-day Seminar Sithapathi Ramasamy College Tiruchi	23-24Jan. 1997
16.	Dr.P.Veeramani	2-level sets & fuzzy topological spaces	One-Day Symposium, P.G.Centre of Madras Univ. College of Eng. Salem.	Feb.21 1997

S.No.	Name of faculty	Topic of Lecture	Delivered at	Date
17.	Dr.P.Veeramani	On fuzzy metric Spaces	Sacred Heart College, Thirupattur	Mar.14 1997

4.9.11 Books and Monographs:

S.No.	Title	Faculty
1.	Differential Calculus (IGNOU, New Delhi)	Dr. S.N. Majhi Dr. P.Bhattacharyya (Co-authors)
2.	Fundamentals of Logic*	Dr. A. Singh Dr. C. Goswamy
3.	Introduction to Mathematical Modelling*	Prof.S.N.Majhi
4.	Introduction to Operator Theory*	Dr. M. T. Nair

* Under Preparation

4.9.12 Visits Abroad:

S.No.	Name of the faculty	Country visited	Date	Purpose of visit
1.	Dr.M.T.Nair	Germany	May-June 1996	as visiting Professor
2.	Prof.P.R.Parthasarathy	Italy	14 Oct-1 Nov 1996	to participate in a workshop at ICTP.
3.	Prof.P.V.Subrahmanian	Greece	July 10-17 1996	to deliver an invited talk in an Int.Conference.

4.9.13 Distinguished visitors to the Department:

S.No.	Name of the Visitor and Occupation	Date	Purpose of visit
1.	Prof.G.Sankaranarayanan Retired Head of the Dept. of Maths, Annamalai Univ. Annamalainagar	12.9.96	To give Special Seminar
2.	Dr.Matti Vuorinen Maths Department Univ. of Helsinki Helsinki, Finland	20.1.97	-do-
3.	Dr. D.N. Verma TIFR, Homi Bhaba Road Mumbai 400 005	27.1.97	-do-
4.	Dr.Herb Silverman Maths Department Univ. of Charleston Charleston, USA	30.1.97	To give Special Seminar
5.	Dr. W. Witte Univ. of Melbourne Australia	30.1.97	-do-

4.9.14 Sponsored Projects:

S.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Co-ordinators
1.	Functional Differential equations arising in the study of materials with memory	1997-2000	NBHM	4.00	Dr.D.Bahuguna
@2.	Differential-Integro Differential equations in visco elasticity	1996-98	ICSR	0.50	Dr.D.Bahuguna
#3.	Algorithmic Graph	1992-96	NBHM	1.00	Dr.S.A.Choudum
@4.	Design & implementation of Graph Theory Algorithms	1995-97	ICSR	0.50	Dr.S.A.Choudum
@5.	Anomalies in 2+1 dimensional quantum field theories	upto 1997	DST	1.76	Dr.S.G.Kamath
\$6.	On estimating errors in regularization methods for ill-posed operator equations	1997-2000	NBHM	3.34	Dr.M.T.Nair
@7.	On approximately solving ill-posed integral equations	1996-98	ICSR	0.50	Dr.M.T.Nair
@8.	Transient Analysis of queuing and related systems	1994-97	NBHM	3.50	Prof.P.R.Parthasarathy
@9.	Queueing models of computer performance	1996-99	Indo-German	-	Prof.P.R.Parthasarathy
@10.	Design & implementation of cell division on patterns	1996-98	ICSR	0.50	Dr.R.Rama
@11.	Implementation of a Numerical method for Singularly perturbed TPBVP using partial decoupling	1996-98	ICSR	0.50	Dr.A.Singh
@12.	Theoretical and Experimental investigation of heat transfer from a totally blocked fuel sub-assembly of a liquid metal fast breeder reactor	1996-98	IGCAR	15.20	Dr.S.K.Das Dr.R.Usha Dr.S.P.Venkateshan
@13.	Centrifugal effects in annual squeeze film	1994-96	ICSR	0.50	Dr.R.Usha

\$: Sanctioned, # : Completed, @ : Ongoing

4.9.15 Honours and Awards:

S.No.	Name of Faculty	Honours/Awards
1.	Prof.P.V.Subrahmanyam	Elected fellow of Forum D'Analyse (Madras)

4.9.16 Weekly Seminar:

Under the auspices of Mathematics Department, a seminar talk is being arranged on every Thursday during 3.00 p.m. to 4.00 p.m. The speakers include visitors from abroad, faculty members of various Institutes in Madras and various Departments from IIT Madras. The post-graduate students of the Department, the Research Scholars and the Faculty Members of the Department and interested persons from the other neighbouring Institutions are highly benefitted by this programme. Topics dealt with by the speakers range from pure mathematics to applications relevant to engineering problems, social sciences and biological sciences. The co-ordinator of this programme for the period under report was Dr.P.Veeramani.

4.9.17 Other activities:

The Department conducted an exhibition on the occasion of Open House - Tech 21 which attracted a number of visitors specially young students.

The department has taken appropriate steps to develop interaction with industry which resulted in opening up new avenues for job opportunities for its postgraduate students. It is to note that a majority of its students have been recruited in software firms with attractive salary.

Many of the faculty members have also been working in Editorial Boards of Journals of national and international repute.

4.9.18. Research Publications:

1. D.Bahuguna (with P.S.Srinivasan) Integrodifferential equations of the parabolic type, Proceedings of the Conference on Mathematics and Applications Engg. and Industry, Roorkee University, Roorkee, 1996.
2. D.Bahuguna, Regular solutions to quasilinear integrodifferential equations in Banach spaces, *Applicable Analysis*, 62 (1997) 1-9.
3. S.A.Choudum, (with S.P.M.Kishore) All 5-starts are Skolem graceful, *Ind. J. Pure & Appl. Maths.*, 27 (1997) 1101-1105
4. S.Kalpakam (with K.P.Sapna) An (s,S)-perishable system with arbitrarily distributed lead times, *OPSEARCH*, 33 (1996) 1-19.
5. S.Kalpakam (with K.P.Sapna) A lost sales inventory system with supply uncertainty, *Computer Math. Appl.*, 33 (1996) 81-93.
6. S.H.Kulkarni, The concept of spectrum in the context of a real algebra, *MAthematics Newsletter*, 6 (1996).
7. M.T.Nair, Error estimates for Tikhonov Regularization with unbounded operators, *Res. Rep. Pre-print No 279*, ISSN0943-8874, June 1996, Univ. of Kaiserslauten.
8. P.R.Parthasarathy (with G.K.Agrofiotis, M.Sharafali) On the total overtime service in some loss queueing systems, *J. Appl. Stats. Sci.*, 5 (1996) 27-37.

9. P.R.Parthasarathy, On the transient solution of birth-death master equation with an application to a chiral chemical system, *Ind. J. Chemistry*, 35A (1996) 1021-1024.
10. P.R.Parthasarathy (with R.B.Lenin) On the numerical solution of transient probabilities of quadratic birth & death process, *J. Difference Eqns. & Applns.*, (1997).
11. P.R.Parthasarathy, The effect of super infection on the distribution of infectious period - A continued fraction approximation, *IMA. J. Math. Appl. in Med. & Biology*, (1996).
12. P.R.Parthasarathy (with J.H.Matis, R.Kiffe) Using density dependent birth-death migration models for analyzing Muskrat spread in Netherlands, *Ind. J. Agr. Stat.*, 49 (1996) 149-156.
13. C.V.Raghava Rao (with YVSS Sanyasiraju) Steady simple shear flow past a circular cylinder at moderate and high Reynolds numbers - A numerical study, *J. Indian Inst. Sci.*, 76 (1996) 379-387.
14. C.V.Raghava Rao (with YVSS Sanyasiraju) Natural convection heat transfer of cold water in an eccentric horizontal cylindrical annulus, *Int. J. Computational Mechanics*, 18 (1996) 464-474.
15. C.V.Raghava Rao (with YVSS Sanyasiraju) Steady flow past a circular cylinder with parabolic velocity distribution -A numerical study, *J. Indian Inst. Sci.*, 77 (1997)
16. R.Rama (with L.Anbarasu) Note on separated handle rewriting interval hypergraph grammar, *Proceedings of National Workshop on graph theory and its Applications*, M.S.University, Tirunelveli, (1996) 24.
17. R.Rama (with Kamala Krithivasan, V.Sunitha) Splicing arrays, *Proceedings of National Seminar on advanced Mathematical*
18. approaches to Problems on Advanced Mathematical Approaches to Problems in Indian Industry, *Andhra Univ.*, (1996) 12-14.
19. P.V.Subrahmanyam (with S.K.Sudarsanam) A note on fuzzy Volterra integral equations, *F.S.S.*, 81 (1996) 237-240.
20. P.V.Subrahmanyam, (with s.K.Sudarsanam) A note on a functional integral equation, *DEDS*, 4 (1996) 473-478.
21. P.V.Subrahmanyam, On the integrable solution of a class of fuzzy functional equations, *Int. J. Fuzzy & Knowledge based systems*, 5 (1997) 59-69.
22. R.Subramanian (with V.Anantharaman) A two unit warm standby system with variable repair rate, *Probability models and statistics*, A.J.Medhi Festschrift, Eds. A.C.Borthaken and H.Chodhury, New Age Internation (P) Ltd., New Delhi (1996) 199-209.
23. R.Usha (with R.Sridharan) Arbitrary squeezing of viscous fluid between elliptic plates, *Fluid dynamics Research*, 18 (1996) 35-51.
24. R.Usha (with R.Sridharan) Effect of mass transfer on a similar flow in the magnetohydrodynamic squeeze film, *Trans. ASME-J. Appl. Mech.*, 64 (1997).
25. W.B.Vasantha, I^* -rings, *Chinese Quat. J. Maths*, 11 (1996)11-13 W.B.Vasantha, A note on group rings which are F-rings, *Acta Clinica Indica*, XXIIIM (1996) 251-252.
26. W.B.Vasantha, On psuedo Niven numbers, *The Maths Educations*, XXX (1996) 191-192.
27. W.B.Vasantha, Division of lattice intervals and new lattices, 4 (1996) 45-50.
28. W.B.Vasantha, On ideally strong group rings, *The Maths Education*, XXX (1996) 71-72.
29. W.B.Vasantha, On semipotent linear operator and matrices, *J. Phy. Sciences*, 8 (1996) 254-256.
30. W.B.Vasantha, On the matrix equation $X^n+Y^m=Z^p$, *Ul. Sc. Phy. Sci. No.2* (1996) 265-266.

31. W.B.Vasantha, On ordered groupoids and its groupoid rings, J. Math. and Computer Science, 9 (1996) 145-127.
32. W.B.Vasantha, Finite rings which have isomorphic quotient rings formed by non-maximal ideals, The Maths Education, XXX(1996) 125-126.
33. W.B.Vasantha, Multi-fuzzy differentiation in fuzzy polynomial rings, J. Math & Comp. Science, 9 (1996) 171-173.
34. P.Veeramani (with S.Sadiq Basha), Best proximity pairs and best approximations, Acta Sci. Math., 63 (1997) 3-14.

4.10 Mechanical Engineering Department

1. Introduction:

The Department of Mechanical Engineering was established in 1959. The Department offers Ph.D., M.S., M.Tech., and B.Tech. programmes. The M.Tech programme has been re-organised during 1996-97 and will have only three streams, namely:

1. Thermal Engineering Stream

Comprising of Combustion and Propulsion, Heat Transfer and Thermal Power, Hydroturbomachines, I.C.Engines and Gas Turbines, Refrigeration and Airconditioning and Thermal Turbomachines.

2. Design Stream

Comprising of Machine Design, Machine Dynamics, Mechanical Handling and Composite Technology.

3. Manufacturing Engineering Stream

Consisting of Advanced Manufacturing Engineering, Computer Integrated Manufacturing and Precision Engineering.

Teaching and Research are carried out in all the above mentioned areas of specialisation.

2. Academic Programmes:

2.1. New Courses Introduced

S.No.	Course No.	Title	Structure	Faculty
1.	ME 670	Stress and Compliance in Machine Components	3 0 0 3	M E Lab.
2.	ME 680	Finite Element Evaluation of Designs	3 0 0 3	ME Lab.
3.	ME 679	CAD and Machine Elements Laboratory	0 0 3 1	M E Lab
4.	ID 701	Constitutive Modeling in continuum Mechanics		Dr.Raju Sethuraman Dr.J.Ravi Prakash Dr.M.S.Sivakumar Dr.C.Lakshmana Rao

2.2. Students on Roll

Programme	I year	II year	III year	IV year	V year	Others	Total
Ph.D.	13	12	15	9	11	32	92
M.S.	21	14	13	5	-	-	53
M.Tech.	88	61	-	-	-	-	149
B.Tech.	84	78	86	90	-	-	338
Total	206	165	114	104	11	32	632

2.3. Number of Scholarship/Fellowship holders

Programme	Institute Scholarship	Others	Total
Ph.D.	46	17 (QIP)	63
M.S.	31	-	31
M.Tech.	60	8 (QIP)	68
Total	137	25	162

2.4. Number of Degrees Awarded in the last convocation

Programme	Total
Ph.D.	11
M.S.	11
M.Tech.	83
B.Tech.	80
Total	185

3. Faculty and their Development:

3.1. Faculty

Name and Qualifications

Major area of Specialization

Professors

Ajit Kumar Kolar, Ph.D.(IIT Madras)

Fluidized Bed Combustion Technology, Heat Transfer, Energy

Balabaskaran, V., Ph.D.(IIT Madras)

Fluid Mechanics, Pumps and Hydroturbines

Bhaskaran, K.A., Ph.D.(IIT Madras)[Head]

Thermodynamics, Combustion and Propulsion, Kinetic Modelling of Combustion Reactions, Shock Tube Studies

Ganesan, V., Ph.D.(IIT Madras)

I.C. Engines & Gas Turbines

Name and Qualifications	Major area of Specialization
Gopalakrishnan, K.V., Ph.D.(IIT Madras)	I.C. Engine
Gopinath, K., Ph.D.(IIT Madras)	Machine Design, Friction & Wear Powder Metallurgy
Krishnaiah Chetty, O.V., Ph.D.(IIT Madras)	Manufacturing Engg./Metal Removal Processes
Krishnamurthy, R., Ph.D.(IIT Madras)	Manufacturing Engg./Tribology/Ceramic & Composite Materials
Krishna Sastrl, V.M., Ph.D.(Delaware,USA)	Fluid Mechanics, Heat & Mass Transfer, Renewable Energy Studies
Kumaraswamy, S., Ph.D.(IIT Madras)	Fluid Mechanics, Pumps and Hydroturbines
Lakshminarayana, K., Ph.D.(IIT Madras)	Mechanisms & Transmissions Design Optimization, Machine Design
Madhusudana Rao, M., Ph.D.(IIT Madras)	Mechanical Handling, Material Flow (Bulk), Design of Equipment
Nagalingam, B., Ph.D.(IIT Madras)	I.C. Engines
Nagarajan, T., Ph.D.(IIT Madras)	Robotics, Pneumatics, Medical Instruments
Natarajan, R., Ph.D.(Waterloo) (Director, IIT, Madras)	Hetrogeneous Combustion, Energy conservation, Rocket and Ramjet Combustion, Thermodynamics, Analysis of Energy Systems
Phillp, P.K., Ph.D.(IIT Madras)	Manufacturing Eng./CAD/CAM/Material Removal Processes
Premananda Shet, U.S., Ph.D.(IIT Madras)	Thermodynamics, Combustion & Propulsion, Industrial Gas Utilization, Swirl and Supersonic Combustion
Radhakrishnan, V., Ph.D.(IIT Madras)	Manufacturing Engg./Metrology
Raman, R., Ph.D.(IIT Madras)	Precision Engineering, Measurements, Tribology
Seetharamu, K.N., Ph.D.(IIT Madras)	Heat Transfer, Fluid Flow
Shunmugam, M.S., Ph.D.(IIT Madras)	Manufacturing Eng./Metrology & Quality Control, CAM
Singaperumal, M., Ph.D.(IIT Madras)	Fluid Power Systems, Mechatronics, Modelling and Simulation
Siva Prasad, N., Ph.D.(IIT Madras)	Finite Element Analysis, Computer Aided Design
Sriramulu, V., Ph.D.(IIT Madras)	Thermodynamics, Combustion & Propulsion
Srinivasa, Y.G., Ph.D.(IIT Madras)	Instrumentation and Control, Active Noise Control, Active Suspension
Srinivas Rao, P., Ph.D.(IIT Madras)	I.C. Engines

Name and Qualifications

Srinivasa Murthy, S., Ph.D.(IIT Madras)

Venkatesh, A., Ph.D.(IIT Madras)

Venkateshan, S.P., Ph.D.(IISc,Bangalore)

Vijay R Raghavan, Ph.D.(IIT Madras)

Pramod S Mehta, Ph.D.(Loughborough, UK)

Sundararajan, T., Ph.D.(Pennsylvania)

Associate Professors:

Govindamallan, K.R., Ph.D.(IIT Madras)

Govardhan, M., Ph.D.(IIT Madras)

Jayaprakash, V., Ph.D.(IIT Madras)

Krishna Kumar, R., Ph.D.(IIT Madras)

Krishnamurthy,S., Ph.D.(IIT Madras)

Kuppuswamy, G., Ph.D.(IIT Madras)

Mani, A., Ph.D.(IIT Madras)

Muthuveerappan, G., Ph.D.(IIT Madras)

Narayanasamy, K., Ph.D.(IIT Madras)

B.V.S.S.S. Prasad, Ph.D.(IIT Kharagpur)

Raju Sethuraman, Ph.D.(IIT Bombay)

Ramamoorthy, B., Ph.D.(IIT Madras)

Ramesh Babu, N., Ph.D.(IIT Madras)

Vijayaraghavan, L., Ph.D.(IIT Madras)

Major area of Specialization

Refrigeration & Airconditioning, Thermal Energy Conservation, Food Processing & Preservation and Transport

Thermodynamics, Thermal Applications of Solar Energy

Heat Transfer, Measurement, Controls & Instrumentation

Heat Exchangers and Cooling Towers, Heat Recovery and Conservation

I.C. Engines

Spray Combustion, Mixing & Combustion of High Speed Jets, Computational Fluid Dynamics & Heat Transfer, Thermodynamics

I.C. Engines

Thermal Turbomachines (Tip Clearance Flows, Inlet Distortion Studies, Well's Turbine)

Machine Design, FEM Analysis, CAD Chemical Machiavelli Design

Non-linear/Linear F.E., CAD, Fracture Mechanics

Machine Design, Failure Analysis Gears

Manufacturing Engineering

Refrigeration & Airconditioning Thermal Applications of Solar Energy Cryogenic Eng.

Machine Design, Vibration & Stress Analysis

Precision Engineering, Manufacturing Methods & Surface Engineering Methods

Thermal Turbomachines (Heat Transfer in Turbine Blades, Cascade Flow Studies)

Computational Mechanics, Stress Analysis, Design of Machine Elements & Fracture Mechanics

Metrology, CAI/sensors/Mfg. Eng./Quality Control

CIM/CNC/PLC/Sensors/Unconventional Machining/Lasers

Metal Cutting/CAD/Condition Monitoring

Name and Qualifications**Major area of Specialization****Assistant Professors:**

Gopalan, K.N., Ph.D.(IIT Madras)

Analysis, Simulation & Dynamics

Mayuram, M.M., Ph.D.(IIT Madras)

Surface Engineering, Wear & Wear Control, Stress Analysis

Prakash M. Malya, Ph.D.(IIT Madras)

Refrigeration and Airconditioning, Industrial Ventilation, Absorption Heating & Cooling Systems

Ramalingeshwara Rao, M.Tech.(IIT Madras)

Instrumentation and Control

Ramesh, A., Ph.D.(IIT Madras)

Alternative Fuels, Performance Improvement of Two Stroke & Four Stroke Engines

Sarit Kumar Das, Ph.D.(Sambhalpur)

Heat Exchangers, New Test Techniques for Heat Exchangers Thermal Hydraulic Simulation of Fast Breeder Reactor

Sitaram, N., Ph.D.(Pennsylvania-USA)

Thermal Turbomachines (Boundary Layer Studies, CFD, TIP Clearance Flows)

Venkatarathnam, G., Ph.D.(IIT Karagpur)

Cryogenic Systems, Compact Heat Exchangers, Refrigerant Mixtures

Chief Design Engineer:

Chennabasavan, T.S., M.Sc.(Eng.) (Aston)

Design of Special Purpose Machines

Senior Design Engineer:

Kalandar Saheb, S.D., M.Tech.(IIT Madras)

Design of Mechanical Machines/Design of manufacture, Jigs and fixtures/Powder Metallurgy Parts

Scientific Officer:

Boopathy, S., M.E.(Bharathiyar Univ.)

Manufacturing Eng./Automation

Senior Maintenance Engineer:

Arun, A., B.E.(Madras Univ.)

Refrigeration Engineering

3.2. Short-term Courses/Workshops/Seminars/Symposia/Conferences organised by the Department Need Analysis for Short Term Programmes in Mechanical Engineering

S.No.	Co-ordinators	Title and Venue	Period
1.	Prof.K.A.Bhaskaran Prof.M.S. Shunmugam	Workshop on Need Analysis for Short Term Programmes in Mechanical Engineering Sponsored by AICTE for Tamil Nadu and Andhra Regions at PSG College of Technology, Colmbatore	03/03/1996

S.No.	Co-ordinators	Title and Venue	Period
2.	Prof.K.A.Bhaskaran Prof.M.S. Shunmugam	Workshop on Need Analysis for short term programmes in Mechanical Engineering at University College of Engineering Osmania Univ. Hyderabad	10/02/1996
3.	- do -	-do- at College of Engineering, Guindy, Madras	17/02/1996
4.	Dr.V.Balabaskaran & Dr.S.Kumaraswamy	Members of the Local Organizing Committee for the 4th National Conference on Air-Breathing Engines	Dec. 1996
5.	Dr.S.Kumaraswamy	Member of the Organizing Committee for TECH 21 Exhibition and Symposium organized by IIT, Madras	Jan. 1997
6.	Dr.V.Balabaskaran	Member of the International Advisory Committee for the International Symposium on Fluid Machinery and Fluid Engineering, organized by the Chinese Society for Engineering Thermophysics, Beijing, China	Sep. 1996
7.	Prof.B.Nagalingam Dr.A.Ramesh	QIP Short-term course on "Use of Natural Gas in I C Engines"	02/12/96 to 06/12/96
8.	-do-	Third National Conference on "Air Breathing Engines & Aerospace Propulsion" was organised by Mechanical Engineering Department and Aerospace Engineering Department	28/12/1996 to 30/12/1996
9.	Dr.N.Siva Prasad	Short-term Training Programme: Computer Graphics	1996
10.	Prof.V.Radhakrishnan Dr.N.Ramesh Babu	First SERC School on 'Advanced Manufacturing Technology'	03/06/1996-to 16/06/1996
11.	Prof.T.Nagarajan	IDP (Technology application Programme) on "Robotics: Its application and adoption in India." organised under the Industrial Associateship scheme of IIT., Madras	09/07/1996
12.	Dr.Sarit Kumar Das	Technology Appreciation Program on Plate Heat Exchangers	07/06/1996
13.	Dr.Sarit Kumar Das	Workshop on Recent Trends in the Design & Analysis of Heat Exchangers	17/08/1996
14.	Dr.Sarit Kumar Das	Winter School on Advances in Heat Exchangers	16-20 Dec.1996

3.3. Short-Term Courses/Workshops/Seminars/Symposia/Conferences/ Training attended by the Faculty in recognised Academic Institutions and Public Sector Units

S.No.	Name of Faculty	Title	Period/Duration
1.	Prof.K.A.Bhaskaran	NBA Workshop on Accreditation	16/04/1996
2.	Prof.K.A.Bhaskaran	Workshop on Strategic Options for IIT Madras	6/01/1996
3.	Prof.K.A.Bhaskaran	Implementation of ISO-9000 and TQM at IIT Madras	24/08/1996
4.	Dr.V.Balabaskaran & Dr.S.Kumaraswamy	One Day Workshop on Design, Selection, Testing and Maintenance of Pumps, PSG College of Technology, Coimbatore	Jun. 1996
5.	Dr.V.Balabaskaran & Dr.S.Kumaraswamy	2nd National Symposium on Fluid Machinery, PSG College of Technology, Coimbatore	Jun. 1996
6.	Dr.S.Kumaraswamy	Workshop on Organization change Processes for IIT, Madras, conducted by ACME, Madras	1996
7.	M.M.Mayuram	AIMTDR Conference	09/01/1997-11/01/1997
8.	Dr.M.S.Shunmugam	Invited paper: Trends in Precision Metrology, National Seminar on 'Computer aided Inspection and Advanced metrology MIT, Anna University	Feb. 1996
9.	Dr.N.Ramesh Babu	Workshop on 'Organisational change processes' for IITM by ACME, Madras	24/06/1996-26/06/1996
10.	Dr.M.Madhusudana Rao	SILO Tech 97, Hyderabad Bucket Elevator, NBC, Hyderabad	23/01/97-24/01/97
11.	Dr.U.S.P.Shet	National Symposium on Acoustics, NSA-96	21/11/1996-23/11/1996
12.	Dr.U.S.P.Shet	NCABE 96	28/12/1996-30/12/1996
13.	Dr.U.S.P.Shet	AICTE	20-05-1996

3.4. Special Lectures Delivered by the faculty in other Institutions

S.No.	Name of Faculty	Topic of Lecture	Venue & Date
1.	Dr.V.Balabaskaran	Mechanical Design and Construction of Centrifugal Pumps, Workshop on Design, Selection, Testing and Maintenance of Pumps	PSG College of Technology, Coimbatore 27th June 1996
2.	Dr.S.Kumaraswamy	Hydraulic Design of Impeller and casing of Centrifugal Pumps, Workshop on Design, Selection, and Maintenance of Pumps	PSG College of Technology, Coimbatore, 27th June 1996
3.	Dr.Raju Sehturaman	'Visco-Plastic flow and thermal analysis of metal forming process' Int. Workshop on role of Fluid mechanics in material processing & manufacturing	University of Bangalore, 1-3 July 1996
4.	Prof.P.K.Phillip	Present development in flexible automated manufacturing	MA College of Engineering, Kothamangalam, Kerala
5.	Prof.R.Krishnamurthy	AICTE sponsored short term courses on 1. Megatrends In Manufacturing 2. Mechatronics	REC Surathkal Oct. 1996
6.	Dr.R.Krishnamurthy	Special lecture on CAM a National seminar	Anna University
7.	Dr.B.Ramamoorthy	Special lecture on "Machine Vision Application in Metrology"	MIT Madras Jan. 1997
8.	Dr.S.Boopathy	Open System controllers, for AICTE Training Programme on Drives and Controls	PSG Techology Coimbatore Dec. 1996
9.	Dr.S.Boopathy	Lecture on CAD implementation for design and development of railway coaches (20 lectures)	ICF Madras Jan-Mar. 1997
10.	Dr.M.Madhusudana Rao	Pneumatic Earveyer and Bucket Elevator	NBC, Hyderabad Oct. 1996
11.	Prof.M.Singaperumal	Hydraulic controls & Precision Tools	KREC, Surathkal 4-6 Oct., 1996
12.	Prof.M.Singaperumal	Proportional & Electrohydraulic servo-valve Technology	FPSI, Bangalore 5-6 Dec., 1996.
13.	Prof.M.Singaperumal	Application of Digital Hydraulics	RCI, DRDL, Hyderabad 19- 23 Aug. 1996.

S.No.	Name of Faculty	Topic of Lecture	Venue & Date
14.	Prof.Y.G.Srinivasa	Fuzzy Logic Control	KREC, Surathkal.
15.	Dr.M.Govardhan	Steam Turbines	MRL, 21/11/96
16.	Prof.U.S.P.Shet	Image Processing of Turbulent Jet Flames Seminar: Development in Optical Diagnostics for Spray Characterization & Fluid Dynamics Instrumentation	I.I.Sc., Bangalore Feb 17, 1997
17	Prof.Ajit Kumar Kolar	Fluidised Bed Combustion - The First Choice Tech. Energy and Fuel Users Association	1996
18	Prof.Ajit Kumar Kolar	Energy Scenario in India - An Overview	Anna Institute of Management 25th Nov.1996
19.	Prof.Ajit Kumar Kolar	Recent Development in Fluidized Bed Bio-mass Gasification	Anna Univ. 21/03/1997
20.	Prof.V.M.K.Sastri	Heat Transfer In Rotating	State Univ. of New York at Stony Brook, NY, USA, June 1996.
21.	Prof.V.M.K.Sastri	Fluidized Bed Heat Transfer	Drexel University, Philadelphia, PA, USA, May 1996.
22.	Prof.T.Sundararajan	Invited lecture on Unstructured Grid Generation	DRDL Hyderabad Nov.1996
23.	Dr.M.S.Shanmugam	Invited Lecture: Precision Metrology and Tolerance analysis	DRDL Hyderabad, Nov.1996
24.	Prof.V.Radhakrishnan	Invited speaker on Material Handling and Automation	International Seminar organised by the Confederation of Eng. Industries
25.	Prof.V.Radhakrishnan	Golder Jubilee Commemoration lecture	Mech. Eng. Dept. IISc Bangalore

3.5. Visits Abroad by faculty

S.No.	Name of Faculty	Country visited	Date	Purpose of visit
1.	Dr.Raju Sethuraman	Canada, Univ.of Waterloo	May-July 1996	
2.	Prof.V.Radhakrishnan	Germany	Return In Sept.1977	AvH Foundation award

S.No.	Name of Faculty	Country visited	Date	Purpose of visit
3.	Dr.N.Ramesh Babu	Germany	Jan. 96	In connection with Volkswagen Foundation project
4.	Dr.N.Ramesh Babu	Boston, MA USA	7-10 July 1996	Attended '1996 Japan-USA symposium on Flexible Automation' (sponsored by ASME) to present a paper
5.	Dr.O.V.Krishnah Chetty	Trinidad & Tobago, West Indies	Dec. 94	As Professor of Production Eng. & Management - Programme Leader of P G Courses In Production Engg. & Management
6.	Prof.M.Singaperumal	Japan	2-16 Nov. 1996	Conference & Visit to Universities
7.	Prof.S.Srinivasa Murthy	Germany	May-June 1996	Indo-German Project
8.	Dr.A.Venkatesh	U.S.A. Denver Colorado	15.6.96-24.6.96	World Renewable to Energy Congress (WREN IV), (to present a paper)
9.	Prof.S.P.Venkateshan	U.S.A.	May-July 1996	Visit to JPL, USA for Fuel Cell Research
10.	Prof.V.M.Krishna Sastril	San Diego; U.S.A	7-11 July 1996	1996 ASME Fluids Engineering Division Summer Meeting

3.6. Honours and Awards

S.No.	Name of Faculty	Honours/Awards	Purpose
1.	Dr.V.Balabaskaran	Invited by the Chinese Society of Engineering Thermophysics, Beijing, China to act as a member of the International Advisory Committee for the International Symposium on Fluid Machinery & Fluid Engineering held during Sept. 9-12, 1996	
2.	Dr.S.Kumaraswamy	Award of excellence	In his field of work by the Industrial Economic Forum, New Delhi.

S.No.	Name of Faculty	Honours/Awards	Purpose
3.	Prof.V.Ganesan	Sir Rajendra Nath Mookerjee Memorial Medal for 1995-96	For paper entitled "New Methodologies in Numerical Simulation of Gas Turbine Combustor Flows" published in the Journal of Institution of Engineers, India, 1996
4.	Dr.Raju Sethuraman	Included In Who's Who In Science & Engineering	
5.	Prof.V.Radha Krishnan Humboldt Research	Award of DM.150,000/- by Alexander von Humboldt Foundation, Germany	For internationally acclaimed research and excellence in the field of specialisation - 1996
6.	Prof.P.K.Phillip	Biographical sketch has been indented in the 15th Edition of Marqu's Who's Who in the World, USA	
7.	Dr.N.Ramesh Babu	Member, Organising Committee, 5th Pacific Rim Intl. Conference on Waterjet Technology to be held at Delhi during Feb 3- 5, 1997	
8.	Dr.B.Ramamoorthy	Two Awards	For the technical papers from the leading National conference conducted by Coimbatore Engineering College & Anna University (won by the B.Tech Students - project)

3.7. Books / Monographs Published

S.No.	Name of Faculty	Title	Publisher
1.	Prof.V.Ganesan	"Internal Combustion Engines	Tata McGraw Hill In Engines" 1994 & within the span of two years 4 reprints have been published. McGraw Hill International have brought out this book as an American edition in 1996. This is considered as one of the rarest honours for an Indian book to have the Ame edition.
2.	Prof.V.Ganesan	"Computer Simulation four-stroke spark ignition engines"	University Press (Orient Longman Ltd. Hyderabad) In 1996.

S.No.	Name of Faculty	Title	Publisher
3.	Prof.V.Ganesan	Edited a book on "Air Breathing Engines and Aerospace Propulsion", which is the Proceedings of the Third National Conference on Air Breathing Engines and Aerospace Propulsion, 1996	Orient Longman Ltd.
4.	Dr.N.Siva Prasad	Computer Applications (Course Material on CAD)	IGNOU 1996.
5.	Dr.V.Jayaprakash Bhalde Paresh S.Krishnamurthy	"Effect of Profile error on Transmission errors in spur gear drives", Mechanical Eng. Divn.	Journal of Institution of Engineers, India. October 1996
6.	Dr.G.Kuppuswamy	'Principles of Metal Cutting	University Press, 1996

4. Design and Development Activities:

4.1 Brief and specific details of Process/Instruments/Equipment/Software Designed and Developed

1. Abrasive Waterjet Cutting System
2. Developed non-contact optical sensor for temperature measurement.
3. Heat Pump Assisted Dryer for low temperature drying of heat sensitive materials
4. Personal Chair Airconditioner
5. Bubble pump operated absorption cooler
6. A heat flux probe is designed and developed for BHEL Tiruchirapalli for measuring heat flux in the Power Plant boilers.
7. Developed a PC-based Hot-wire Signal Analyser with Fortran Program, for Statistical analysis of hot-wire signal
8. 15 cm dia Bubbling Fluidised Bed to study Drying
9. Test rig for regenerator under development
10. 10 kW burner for the HX test rig.

5. Research and Consultancy:

5.1. Sponsored Projects on hand (only ongoing)

S.No.	Title	Period	Funding Agency	Amount in lakhs)	Co-ordinator(s)
1.	Ignition Studies on Solid Propellant	1993-1996	ISRO	4.495	Prof.K.A.Bhaskaran Dr.Job Kurian (Aero. Engg)

S.No.	Title	Period	Funding Agency	Amount In lakhs)	Co-ordinator(s)
2.	Computational Modelling of the 3 Dimensional Unsteady Viscous Compressible Flows Associated with Cryogenic Steering Engine	1996-1998	ISRO	4.900	Prof.K.A.Bhaskaran Prof.T.Sundararajan
3.	Development of a slurry pumping system using jet pumps		NIOT	43.67	Dr.S.Kumaraswamy Dr.M.Madhusudana Rao (MH Lab)
4.	Development of Lean Burn Spark Ignited Natural Gas Engine for Generator Set and Automotive applicatio		AICTE	6.00	Prof.B.Nagalingam Prof.K.V.Gopalakrishnan Prof.V.Ganesan Prof.P.Srinivasa Rao
5.	Investigation of Flow-Combustion Interaction In the Combustion Chamber of Low Emisson Direct Injection Diesel Engine		DST	6.18	Prof.Pramod S. Mehta
6.	Numerical Prediction of Flow & Combustion In Gas Turbine Combustion Systems	1997-1999	Aeronautical R&D Board	4.34	Prof.V.Ganesan
7.	Development of engine energy systems for Rural applications using renewable energy		DST & Eicher Tracotrs Eng. Ltd. (Technology Mission Project-1)	9.00	Dr.A Ramesh Prof.K.V.Gopalakrishnan Prof.B.Nagalingam
8.	Design modifications to Improve the fuel economy & emission of a two-stroke two wheeler engine		DST & LML Vespa & IOC, Faridabad (Technology Mission Project-2)	7.00	Dr.A Ramesh Prof.K.V.Gopalakrishnan Prof.B.Nagalingam
9.	Development of a Model for Combustion, Soot & NOx Emissions from a Direct Injection Diesel Locomotive Engine using Oxygen Enriched Air	1996-97	Argonne National Lab. USA	US \$ 10000/	Prof.Pramod S.Mehta
10.	Development of a fuel efficient low emission two stroke park Ignited engine design		DST	3.59	Dr.A.Ramesh
11.	Finite Element Analysis of Weldments	1996-99	DST	6.07	Dr.N.Siva Prasad Dr.K.N.Seetharamu

S.No.	Title	Period	Funding Agency	Amount In lakhs)	Co-ordinator(s)
12.	Application of Computer Graphics	1995-97	AICTE	8.00	Dr.C.R.Muthukrishnan Dr.N.Siva Prasad Dr M Ramanujam
13.	Automatic and Adaptive Grid Generation for Engineering Analysis	1996-98	ADRB	9.75	Dr.K.N.Seetharamu Dr.T.Sundararajan Dr.N.Siva Prasad
14.	Applications of waterjet Technology In Manufacturing		DST	46.072	Dr.N.Ramesh Babu Dr.O.V.Krishnalaha Chetty
15.	a) Machining of Composites b) AE Studies on Aerospace materials		ISRO-IIT	5.00	Dr.R.Krishnamurthy
16.	Tribological character of plasma sprayed coatings		AICTE	8.00	Dr.R.Krishnamurthy
17.	Application of Vision for Surface and Dimensional Inspection		CSIR	6.87	Dr.V.Radhakrishnan Dr.B.Ramamoorthy
18.	Development of an Interaction computer based Information & guidance package for educational and employment planning		MHRD	6.00	Dr.M.S.Shunmugan
19.	Development of an Improved reciprocating circuit orthosis for paraplegics		Min. of Welfare	7.70	Dr.M.S.Shanmugam
20.	Development of Tech. and Equipment for rapid prototyping & Manufacture using CIM approach	2 years	DST	13.454	Prof.V.Radhakrishnan Dr.N.Ramesh Babu Dr.S.Boopathy
21.	Development of object oriented software for simulation of automated manufacturing systems		DST	7.50	Dr.N.Ramesh Babu Dr.S.Boopathy
22.	Volkswagen Foundation project 'Development of a Production Integrated Quality control loop for NC machining operation through coordinate measurement of finished part and feedback of parameter - modifications to NC		Indo-German Project	DM70900	Prof.A.Weckenmann (German side) Prof.V.Radhakrishnan/Dr.N.Ramesh Babu/Dr.B.Ramamoorthy/Dr.S.Boopathy (Indian side)

S.No.	Title	Period	Funding Agency	Amount In lakhs)	Co-ordinator(s)
23.	Underwater Manipulator		NIOT	25.00	Prof.M.Singaperumal Prof.T.Nagarajan
24.	Dev.of Metal Matrix Composites		TDM	85.00	Prof.M.Singaperumal is one of the member of project team
25.	Development of Active & semilactive suspensions for vehicle	1996-99	DST	9.40	Prof.Y.G.Srinivasa
26.	Development of pumpless solar absorption refrigeration system	1993-1996	Dept. of Nonconventional Energy Sources	11.50	Dr.S.Srinivasa Murthy Dr.M.P. Malya
27.	Alternatives to CFCs for refrigeration applications Energy & Environmental aspects	1994-1996	MHRD & KFA Julich Indo-German Co-operation	1.50+(Appx.trave+equipme nt)	Dr.S.Srinivasa Murthy Prof.L.R.Oellrich Dr.A.R. Balakrishnan Dr.G.Venkatathnam
28.	Development of continuous solar refrigerator with transfer tank	1993-1996	CSIR	4.20	Dr.A.ManI Dr.S.Srinivasamurthy
29.	Development & Testing of Compact Cryogenic Heat Exchangers	1994-1996	DST	7.50	Dr.S.Srinivasa Dr.G.Venkatathnam
30.	Development of Metal Hydride Heat Pumps and Heat Transformers	1995-	Min.of Nonconventional Energy Sources	6.842	Dr.S.Srinivasamurthy
31.	Heat Recovery Systems: Heat Pump Assisted Agricultural Dryer	1996-1998	Planning Commission-MHRD Tech. Dev. Mission	70.00	Dr.S.Srinivasamurthy Dr.A.R.Balakrishnan Dr.M.P. Malya
32.	Vapour Absorption Heat Pump/Chiller	1996-1998	-do-	120.00	Dr.S.Srinivasamurthy Dr.A.R. Balakrishnan Dr.M.P.Malya Mr. Sreenivas Jayanti
33.	Vapour Compression Heat Pump-Chiller	1997-1998	-do-	100.00	Dr.S.Srinivasamurthy Dr.A.R.Balakrishnan Dr.M.P. Malya

S.No.	Title	Period	Funding Agency	Amount In lakhs)	Co-ordinator(s)
34.	Environmentally Friendly Alternatives to CFCs for Compression Heat Pump Applications	1997-	MHRD & DLR Bonn(Indo-German Cooperation)	1.50 (appx. travel equip)	Dr.S.Srinivasa
35.	Tip Clearance Flows in Compressors	1992-95	ARDB	5.00	Dr.N.Sitaram
36.	Self Rectifying Air Turbine	-	NIOT	3.45	Dr.M.Govardhan
37.	Hydrogen Combustion in Supersonic Flows	1994-1998	ISRO	6.771	Prof.T.Sundararajan Prof.U.S.P.Shet
38.	Investigation of Steady & Transient Injection & Mixing in Liquid Rocket Combustors	1995-1998	ISRO	7.30	Prof.R.Natarajan Prof.T.Sundararajan
39.	Investigation of Multi-phase Jet Mixing & Combustion in a Dump Combustor	1995-1998	ARDB	8.03	Prof.R.Natarajan Prof.T.Sundararajan Prof.V.Ganesan
40.	Automatic & Adaptive Mesh Generation	Jul.95-June 97	ARDB	5.65	Prof.K.N.Seetharamu Prof.T.Sundararajan Prof.N.Siva Prasad
41.	Development of a 3-D Unstructured Grid for Blunt cone - Cylinder - Flare with a set of Cruciform Control Surfaces with large Deflections	20.12.95 - 19.06.96	DRDL	4.77	Prof.T.Sundararajan Prof.K.N.Seetharamu

S.No.	Title	Period	Funding Agency	Amount in lakhs)	Co-ordinator(s)
42.	Computational Modeling of the 3-D Unsteady/Steady Viscous Compressible Flows Associated with Cryogenic Steering Engine	Jan.97- Dec.99	LPSC Mahendragiri	4.90	Prof.T.Sundararajan Prof.K.A.Bhaskaran
43.	Studies on the Inter action Between Multiple Supersonic Jets	Jan.97- Dec.99	ISRO Trivandrum	4.94	Prof.T.Sundararajan Prof.V.Ramjee
44.	Technology Development Mission on "Atmospheric Circulating Fluidised Bed Boiler for Industrial Application"	96-98	MHRD & Planning Commission	364	Prof.A.K.Kolar Prof.P.S.Mehta Prof.V.M.K.Sastri
45.	Development of Computer Aided Design & Analysis of Plate Heat Exchangers in the Post Graduate Engineering Education.	96-97	AICTE	2.00	Dr.S.K. Das
46.	Theoretical and Experimental Investigation of Heat Transfer in a totally blocked fuel sub-assembly of a liquid sodium fast breeder reactor	96-98	IGCAR	19.01	Dr.S.K.Das Prof.S.P.Venkateshan Dr. Usha (Maths)
47.	Experimental Set-up under the Young Faculty Scheme of IC & SR	96-97	IC & SR	0.50	Dr.S.K. Das
48.	Development of a Temperature Sensitive Magnetic Switch	96-98	IGCAR	24.73	Prof.K.V.S.Rama Rao Prof.V.Radhakrishnan Prof.A.K.Kolar Prof.K.Prasad Rao

5.2. Industrial Consultancy (only ongoing)

S.No.	Title	Industry	Value In thousands	Co-ordinator
1.	Supply of Hot Water to Pilgrims at Kalyanakatta, Tirumala, 1996-97	Tirumala Tirupathi Devasthanams	Honorary Consultant	Prof.K.A.Bhaskaran
2.	Air-condition Srivari Temple of Tirumala, 1997	Tirumala Tirupathi Devasthanams	Honorary Consultant	Prof.K.A.Bhaskaran
3.	Establishing Post Graduate Courses in Heat Power Eng. - Started In 1996	Vishwakarma Institute of Technology, Pune	Educational Consultant	Prof.K.A.Bhaskaran
4.	Technical Evaluation of Small Scale Industrial Project proposals	SIPCOT	Consultant	Prof.K.A.Bhaskaran
5.	CETP projects at SIDCO, Ranipet, Erode, Kodaikanal, Melpudupet, Chettithangal and Visharam (Ranipet)	Pollution Control Board, Madras	1% of Project Cost	Dr.S.Kumaraswamy
6.	CETP projects at Ayyampet-Muthialpet, Perumalpet, Amaravathi (Karur), Andankoll(Karur), Vaniambadi-VETCO, Sukkalyur(Karur), Karur Taluk, Tiruvai(Karur) and Karur Vanchi	Pollution Control Board, Madras	1% of Project Cost	Dr.S.Kumaraswamy
7.	CETP project for M/s SIPCOT and SIDCO Phase II & Entrepreneur Finished Leather Treatment Company (P) Ltd.	Pollution Control Board, Madras	1% of Project Cost	Dr.V.Balabaskaran
8.	Technical Advice on the design of Pumping System for New Veeranam Project	STC, Bombay	26.00	Dr. S.Kumaraswamy
9.	Technical Consultancy for graphite project at Sivaganga	TAMIN, Madras	1% of Project Cost	Dr.S.Kumaraswamy
10.	Scrutiny of Design and other advisory assistance for the treatment plant	MPT, Madras	91.60	Dr. S.Kumaraswamy

S.No.	Title	Industry	Value In thousands	Co-ordinator
11.	Design and Flow Analysis of Three Dimensional probes & Probe Traversing Mechanisms	University Technology Malaysia, Malaysia	US\$5000	Dr.V.Balabaskaran
12.	Prototype Testing of a process pump	Kirloskar Brothers Ltd	150.00	Dr.S.Kumaraswamy Dr. V. Ramamurthy Dr. S. Swarnamani (App.Mechs.)
13.	Selection of pumping system for a dyeing unit	S.P.Textile Processing P. Ltd. Chitode	10.00	Dr.S.Kumaraswamy
14.	Consultancy for a CETP for Kasipalayam, Tirupur	Pollution Control Board	1.5% of Project Cost	Dr.S.Kumaraswamy
15.	Effect of Ceramic Coated Combustion Chamber on the performance of the Shaktiman Engine	Vehicle Factory, Jabalpur	300.00	Prof.B.Nagalingam Dr.A.Ramesh
16.	Analysis of the Process of Combustion of Pulverised Coal in utility boiler furnaces	BHEL, Hyderabad	105.00	Prof.V.Ganesan
17.	Load testing & stress analysis of Aluminium Cable trays	Crompton Greaves Ltd. Madras	60.00	Dr.K.Gopinath Dr.K.Anantharaman Dr.Raju Sethuraman Dr.C. Lakshmanana Rao Dr.M.S.Shunmugam
18.	Design of Mech. Systems of Doppler Weather Radar Antenna	ISTRAC	120.00	Dr.K.Lakshminarayana Dr.K.Gopinath
19.	FEA of Connecting rod	ISGEC, Yamunanagar	15.00	Dr.N.Siva Prasad
20.	Design of stiffener ring	Whirlpool, Pondicherry	25.00	Dr.N.Siva Prasad
21.	Callbration of CMM with Laser interferometer	M/s Simpson & Co. Madras	25.00	Dr.N.Ramesh Babu Dr.B.Ramamoorthy

S.No.	Title	Industry	Value In thousands	Co-ordinator
22.	Development & Commissioning of Railway Coach Air-conditioning system test-rig (In Three phases I & II Phases completed III phase on going)	I.C.F. Avadi Madras	I, II & III Phases 100.00	Dr.S.Srinivasamurthy Dr.A.Mani Mr.A. Arun
23.	Development of absorption refrigeration systems with environmentally safe working fluids	Sterling Strips Ltd. Bombay	125.00	Dr.S.Srinivasamurthy Dr.G.Venkatarathnam
24.	Test Rig for Air Terminals Air Breeze	HVAC System India (P) Ltd., Madras	100.00	Dr.S.Srinivasamurthy Dr.M.P.Maiya Dr.B.H.L.Gowda
25.	Thermal Modelling of Cryogenic Rocket Pumps Systems Centre, Dept. of Space Liquid Propulsion		150.00	Dr.S.Srinivasamurthy Dr.G.Venkatarathnam Dr.B.V.S.S.S.Prasad
26.	Development of a deep freezer	Fluid Therm Ltd. Madras	1.00	Dr.A.Mani Mr.A.Arun
27.	Upgradation of 1200 kW D.C. Motor to 1400 kW D.C. Motor, Cooling requirements	Ariyalur Cement Facotry	25.00	Dr.M.Govardhan
28.	Design, Fabrication & Calibration of 3-Hole & 5-Hole Probes	BHEL Hyderabad	64.00	Dr.N.Sitaram Dr.M.Govardhan
30.	Development & Supply of Conductivity type Heat Flux Probes - Phase I	BHEL,Tiruchirapalli	360.00	Dr.BVSSS Prasad
31.	Design of Centrifugal Blower for Nitriding	Precision Controls, Madras	6.00	Dr.M.Govardhan
32.	Calibration of "S" Type Probes	G.M.Industries Hyderabad	8.00	Dr.N.Sitaram Dr.M.Govardhan
33.	Design, Fabrication and Callbration of KEIL Probes	Andrew Yule, Calcutta	18.00	Dr.M.Govardhan

S.No.	Title	Industry	Value In thousands	Co-ordinator
34.	Experimental Investigation of air Ingress on Condensation in Surface Condensers and Effect of Spray on Condenser Performance	BHEL Hyderabad	1573.2	Prof.V.M.K.Sastri Prof. A.K. Kolar Prof.S.P.Venkateshan
35.	Conductivity Type Heat Flux Probe	BHEL Trichy	315.00	Prof.A.K.Kolar Prof. S.P. Venkateshan Prof. V.M.K.Sastri Dr.B.V.S.S.S.Prasad
36.	Thermal Analysis of Various Elements Housed inside GSLV L-40 Base Shroud and Thermal Boot	VSSC, Trivandrum	433.00	Prof.S.P.Venkateshan Prof.V.M.K.Sastri Prof.A.K.Kolar
37.	Testing of coal	Commissioner of Customs Tuticorin	25.00	Prof.A.Venkatesh

5.3. RBIC (only ongoing)

S.No.	Name of the Investigator/ CoInvestigator	Title	Number	Value (In lakhs)
1.	Dr K Gopinath	Rolling contact fatigue testing of bearing steel for TISCO Jamshedpur		1.98
2.	Dr K Gopinath	Stainless steel bellow forming machine design Insap Flexibles & Engineers Pvt. Ltd.		1.15
3.	Dr.T.Sundararajan	Computational Fluid Flow Simulation of Gimballed Rocket Nozzles in Ejector - Diffusers for CUS Engine Development, sponsored by LPSC, Trivandrum from Jan. 97 - Jul 97		2.0
4.	Dr.A.Mani Dr.A.Venkatesh	Analysis, design and development of 2 TR LiBr evaporative cooler by Naval Science and Technological Lab. Visakapatnam		1.15

5.4 Retainer Consultancy (only ongoing)

S.No.	Name of the faculty	Title	Industry
1.	Prof.M.S.Shunmugam	Machine Tools Development	M/s.Kerry Jost Eng. Ltd. Madras
2.	Prof.T.Sundararajan	Improvements in Product/Design	M/s. Fluidtherm Technology (P) Ltd. Ambattur, Madras
3.	Prof.Vijay R. Raghavan	Process and Product Improvement	M/s. Fluidtherm Technology (P) Ltd. Ambattur, Madras
4.	Prof.M.Singaperumal	Deep Sea Mining	NIOT
5.	Dr.A.Manil Dr.A.Arun	Development of deep freezer	M/s.Fluidtherm Technology (P) Ltd. Ambattur, Madras

5.5 Research Publication

(a) Journals - International and National

1. Bhaskaran, K.A., Job Kurian, Suresh, V., and Umashankar, P.B., "Ignition Studies on Aluminised Propellant", Defence Science Journal, Vol.45, No.4, Nov.96, pp.411-416.
2. T.Ravisundar, E.G. Tulapurkara, V. Balabaskaran, "Effect of Fins in a Curved Square Duct", Journal of the Aeronautical Society of India, Vol. 28, pp 48-55, May 1996, Madras, January 1996.
3. Ravichandran, M. and Ganesan, V. (1996) "Computation of Isothermal and Reacting Flows in Turbojet Afterburners", International Journal of Numerical Method for Heat and Fluid Flow, U.K. Vol.6, pp 19-34.
4. Ram Reddy, P., Mohan Krishna, D. Govinda Mallan, K.R. and Ganesan, V. (1996) "Modelling of Direct Injection Diesel Engine Combustion and Emissions - An Easy and Reliable Method" Indian Journal of Engineering and Materials Sciences, India, Vol.3, pp.1-8.
5. Ravichandran, M. and Ganesan, V. (1996) "Isothermal Flow Modelling of Gas Turbine Afterburners", Journal of Institution of Engineers, India, Vol.77, pp.67-75.
6. Surface integrity studies on shot-peened thermal-treated EN Steel Spur gears - Dr M M Mayuram (Wear, Vol 193(2), PP 242-247, 1996)
7. Sankaranarayanan T.K. and Siva Prasad N, 'Finite Element Analysis of Temperature Distribution during Arc Welding using Adaptive Grids', ASME Welding Journal, Vol 75, No.4, pp 1235-1285 (1996).
8. Siva Prasad N and Sankaranarayanan T K 'Estimation of residual stress in weldments using Adaptive grids', Computers & Structures, Vol. 16, No.6 pp 1637-1645.
9. Mathews P.Samuel and P.K.Phillip, "Properties of Compacted, pre-sintered and fully sintered electrodes produced by powder metallurgy for electrical discharge machining", Indian JI. of Engineering and Material Sciences, V.3, Dec. '96, pp.229-233.
10. K.Durai and P.K.Phillip, "Variable radial magnetic field for debris evietion in EDM, JI. of Inst. of Engineers (India), Mech. Engg. Division, V.77, No.1996, pp.129-135.

11. O.V.Krishnalal Chetty and K.Raghava Rau, Production planning of FMS under tool magazine constraints, *Int. J. of Advanced Mfg. Techniques*, UK, VII (1996), pp.366-371.
12. O.V.Krishnalal Chetty and O.C.Gnanasekaran, Modelling, simulation and scheduling of flexible assembly systems with coloured petrinets, *Int. J. of Adv. Mfg. Techniques*, UK, VII (1996), pp.430-438.
13. A.K.Chinchoikar and O.V.Krishnalal Chetty, Stochastic coloured petrinets for modelling and evaluation and heuristic rule base for scheduling for FMS, *Int. J. of Advanced Mfg. Techniques*, UK (1996).
14. A.K.Chinchoikar and O.V.Krishnalal Chetty, Simultaneous optimisation of control factors in AS/RS and FMS using SCPN and Taguchi method, *Int. J. of Advanced Mfg. Techniques*, UK, (1996).
15. A.K.Chinchoikar, O.V.Krishnalal Chetty and G.Kuppuswamy, Stochastic coloured petrinets for modelling and performance evaluation for AS/RS, *Inst. of Engineers (India)*, Nov. 1996.
16. S.Gowri, G.Umashankar, K.Narayanaswamy, R.Krishnamurthy, Expert system for process optimisation of atmospheric plasma spraying of high performance ceramics, *Jl. Materials processing technology*, 63 (1997), pp.724-732.
17. M.Subramainam, S.K.Malhotra, R.Krishnamurthy, interesting fractographic observations on toughened epoxies, *J. Material Science Letters*, V.15, 1996, pp.576-578.
18. K.Venkataramana and B.Ramamoorthy, Amplitude varying rate matrix approach for machined surfaces classification, *Institution of Engineers, India*, Vol.77, Nov.1996.
19. S.Ramesh and B.Ramamoorthy, Measurement of surface finish using optical diffraction technique, *Intl. Journal of Wear*, 195, 1996, pp.148-151.
20. K.Venkataramana and B.Ramamoorthy, Statistical methods to compare the texture features of machined surfaces, *Intl. Journal of Pattern Recognition*, Vol.29, No.9, pp.1447-59, 1996.
21. Ganesha Udupa R.S.Sirohi, M.Singaperumal and M.P.Kothiyal, "An Optical System for Surface Roughness and Roundness Analysis" *Jl. of Communications in Instrumentation* Vol.4, No.3 July-Sept. 1996, PP 143-161.
22. Sadashivappa K, M.Singaperumal & K.Narayanasamy, "On the Efficiency of Axial Piston Motors Considering Piston Form Deviations", *Jl. of Mechatronics*, Vol.6, No3, PP 283-301, 1996.
23. Asokan T.& M.Singaperumal, "Damping Variation through Electrohydraulic Servosystem : an application to Active impedance control" *Int. Jl. of Mechatronics*, Vol.6, No.6, PP 613-630, 1996.
24. S.Ravi Teja and Y.G.Srinivasa, Investigations on the Stochastically Optimized PID Controller for a Linear Quarter- car Road Vehicle Model, *Vehicle System Dynamics*, vol.26, PP.103-116, 1996.
25. M.Fatouh and S.Srinivasa murthy, HCFC 22 based vapour absorption refrigeration system, Part I: Parametric studies *Int. J. of Energy Research*, Vol.20(4), 1996, pp.297-312
26. M.Fatouh and S.Srinivasa murthy, HCFC 22 based vapour absorption refrigeration system, Part II: Influence of component effectiveness *Int. J. of Energy Research*, Vol.20(5), 1996, pp.371-384
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6. Distinguished Visitors to the Department

S.No.	Name of the Visitor and Designation	Date of visit	Purpose of visit
1.	Dr.Jean-Loup Chenot and Dr.F.Bay Ecole Nationale Superieure Des Mines De Paris	14-16 Dec. 1996	Cooperation in the area of numerical modelling of die- casting processes
2.	Prof.L.R.Oellrich, Univ. of Karlsruhe, Germany	29/2/96	Industrial Lecture on Mech.Engg. Education & Prospects in Germany
3.	Prof.Satoshi Okajima Hosel University, Japan	12-18 Nov.96	Special Lectures on Combustion
4.	Mr.Claude Verbal and Mr.Max Rumbaugh President & Executive Vice President of SAE International	12-14 Nov.1996	To start Student Chapter of SAE
5.	Prof.E.W.Smith Massey University, New Zealand	5/11/96	Lecture
6.	Prof.Ahmad Yusoff Hassan, University Sains Malaysia	5/11/96	Co-operation in Research
7.	Prof.Dr.Roetzel University of Federal Armed Forces, Hamburg, Germany	2-3 Jan.1997	Special Lectures
8.	Dr.Sonke Brodersen, Director,	20-21 Feb.1997	To discuss about the possible

S.No.	Name of the Visitor and Designation	Date of visit	Purpose of visit
	Research & Development, KSB Pumps, Germany		collaborative projects. He also delivered a lecture on "Research Topics in Pumps in Germany" during his visit
9.	Mr.B.Bhattacharya Manager, Innovation Cell KSB Pumps, Pune, India	20-21 Feb. 1997	To discuss about the possible collaborative projects.
10.	Mr.R.D.Kulkarni, Associate Vice President, Kirloskar Brothers Ltd. Kirloskarwadi	11th Mar.1997	To discuss about the ongoing consultancy project & to give an Industrial Lecture to the B.Tech Students of the Department.
11.	Mr.Claude A.Verbal, SAE 1996 President, Mr.Max E.Rumbaugh, Executive Vice President and Mr.Muril M.Iyer, International Section Developer of SAE	13th Nov. 1996	Visit to IC Engines Lab
12.	Aime Parois Director, Centre for I.C.Engines IFP School, France	18th Mar.1997	Discussion to initiate course program for industry
13.	Prof.R.N.Dubey University of Waterloo	Feb. 1997	Delivered lectures
14.	Geza Heidegger Hungarian Academy of Sciences, Budapest	08-12-96	Lecture
15.	Mr.Kneur Univ.of Erlangen, Neurenburg, Germany	Feb-Mar 1997	Indo-German Project
16.	Prof.Chen Maozhand, Beijing Univ. of Aeronautics and Astronautics	26.4.96	Discussion
17.	Prof. Ram S. Azad University of Mallbou	26.2.97	Discussion
18.	Dr. Sonke Broderson Director, R & D, KSB Pumps, Frankenthal, Germany	21.2.97	Discussion
19.	Prof.W.Roetzel, Head, Institute of Thermodynamics, University of Federal Armed Forces,	Jan. 97	Discussion Indo-German Project

4.11 Metallurgical Engineering Department

1. Introduction:

The Department of Metallurgical Engineering was established in 1959. Now, Ph.D., M.S., M.Tech and Tech. programmes are being offered. The major areas of teaching and research of the Department are:

- a) Metal Casting
- b) Metal Forming
- c) Metal Joining
- d) Materials Technology

2. Academic Programmes:

2.1 New Courses Introduced:

S.No.	Course No.	Title	Structure	Faculty
1.	MT 417	Metal Forming Technology	3-0-0-3	Prof K A Padmanabhan
2.	MT 627	Metal Forming Processes	3-0-0-3	Prof P Venugopal Prof K A Padmanabhan
3.	MT 668	Advanced Powder Processing	3-0-0-3	Dr. Paramananda Singh

2.2 Students on Roll (as on 30th Sept. 1996)

Programme	I Year	II Year	III Year	IV Year	V Year	Total
B.Tech.	31	26	31	29	-	117
M.Tech.	11	12	-	-	-	23
M.S.	1	3	3	1	1	9
Ph.D.	-	4	3	4	21	32
Total	43	45	37	34	22	181

2.3 Number of Scholarship/Fellowship holders:

Programme	Institute Scholarship	Others	Total
M.S.	5	-	5
Ph.D.	12	-	12
Total	17	=	17

2.4 Number of Degree Awarded in the last convocation:

Programme	Number
B.Tech.	28
M.Tech	11
M.S.	-
Ph.D.	5
Total	44

3. Faculty and their Development

Faculty Name & Qualification	Major area of Specialisation
Professors	
Achar, D.R.G. Ph.D. [Head]	Metallurgical Engineering Welding Technology Corrosion, Industrial Metallurgy
Gokularathnam, C.V. Ph.D.	Physical Metallurgy, X-ray diffraction, Powder diffraction, powder metallurgy, advanced ceramics, SEM & TEM
Iyer, K.J.L., Ph.D.	Materials Science, Failure Analysis, Physical Metallurgy
Padmanabhan, K.A., Ph.D.(Cantab)	Metal forming, rolling, sheet metal forming, forging, mechanical metallurgy, superplasticity
Pathak, S.D., Ph.D.	Materials science and technology, mechanical behaviour, material testing, metal casting.
Prabhakar, O., Ph.D.	Metal Casting, Non-destructive testing and process modelling
Prasad Rao, K., Ph.D.	Metal Joining, Corrosion
Radhakrishnan V.M., Ph.D.	Fracture mechanics, high temperature materials, fatigue and creep
Raghavan, S., Ph.D.	Thermodynamics, Solid electrolyte sensors, Hot corrosion
Seshadri, S.K., Ph.D.	Chemical metallurgy, surface technology, utilisation of renewable agricultural resources
Sundaresan, S., Ph.D.	Metal Joining
Venugopal, P., Ph.D.	Metal Forming Processes, Press Tool Design, Hammers and Presses, Cold extrusion of materials
Associate Professors	
Kesavan Nair, P., Ph.D.	Physical Metallurgy

Faculty Name & Qualification

Paramanand Singh, Ph.D.

Major area of Specialisation

Powder Metallurgy, Ceramics and Composites

Assistant Professors:

□ Guha, B., Ph.D.

Fatigue and Fracture Mechanics of Welded joints
FEM/CAD/Testing of Weld & Metals

Sampath, V., Ph.D.

Materials technology, electroslag refining

Swaminathan, K., Ph.D.

Metal forming, materials science

Siddhartha Das

E.M.L.

Senior Scientific Officers

Annamalai, S. (M.S. IIT Madras)

Metal Forming, Forming of P/M Components &
Material Testing

Bhattacharyya, S.S., Ph.D.

High Temp. materials behaviour, Metal Forming

Jothinathan G., M.Tech.(IIT Madras)

NDT Metal casting, Electro Met, Corrosion.

Kumaran, S., M.S.(IIT Madras)

Non Ferrous Extraction Metallurgy, Chemical
Metallurgy**Technical Officer**

Raghunatha Rao, B., Ph.D.

Physical Metallurgy, Metallography & Heat
Treatment Metallurgical Failure analysis**3.2. Short Term Courses/Workshops/Seminars/Symposia/Conferences Organised by the Department**

S.No.	Co-ordinator(s)	Title of Workshop/Seminar/Symposium/Conference	Period
1.	D.R.G.Achar Paramanand Singh	National Symposium of Research Scholars on Metals and Materials Research	July 4-5, 1996
2.	S.Sundaresan	Workshop on Continuing Education	26.4.96
3.	P.Kesavan Nair	Residual Stresses (1-day workshop)	22.8.96
4.	Sampath, V. Raghunatha Rao, B.	Advanced Engineering Materials and Processes	10-11 Oct, 1996

3.3. Short Term Courses/Workshops/Seminars/Symposia/Conferences/ Training Attended by the Faculty in Recognised Academic Institutions and Public Sector Units:

S.No.	Name of Faculty	Title	Period/Duration
1.	D.R.G.Achar	Golden Jubilee NMD & ATM, IIM	14-17, Nov.1996
2.		International Welding Conference, IIW Bombay	5-7, Dec. 1996
3.		14th World Conference on NDT	8-13 Dec.1996
4.		Symposium on Joining of Materials IIW, Tiruchirappalli	Sept. 1996
5.	S.Sundaresan	Workshop on Joining of Aluminium (Aluminium Asso.of India) Bangalore	10-11, May 1996
6.		Symposium on Joining of Materials IIW, Tiruchirappalli	Sept. 1996
7.		International Welding Conference & National Welding Seminar of IIW, Bombay	Dec. 1996
8.	S.Raghavan	Symposium Electrochemistry in Metallurgy and Materials IISc., Bangalore	Aug21-23, 1996
9.	P.Kesavan Nair	National Welding Conference IWC - 96	Dec.5-7, 1996
10.	Paramanand Singh	22nd National Powder Metallurgy Conference	26.4.96
11.		International Symposium on 50 Yrs of Metallurgy Retrospect & Prospect	Nov. 14-18, 1996
12.		Int.Conference and Exhibition on Powder Metallurgy for Automotive Components	Feb.10-12,1997

3.4 Special Lecture(s) Delivered by the Faculty in other Institutions

S.No.	Name of Faculty	Topic of Lecture	Venue & Date
1.	Achar D.R.G.	Introduction of Aluminium Joining	Aluminium Association of India, Bangalore 10th May & 11th May 1996
2.		Computer Aided Selection of Stainless Steel Filler Materials	IIM Madras Chapter & IIT Madras 4-5 July 1996.
3.	Achar D.R.G.	Dynamic Fracture Toughness Behaviour of HAZ of Q & T Steel Weldments	International Symposium on Joining of Materials(SOJOM'96) Trichy 12-14 Sept,96

S.No.	Name of Faculty	Topic of Lecture	Venue & Date
4.	Achar D.R.G.	Latest Trends and Developments in Metal Joining Technology	Technology Summit '96 Hyderabad 11-12 Oct.96 Organised by IMTMA.
5.		Plasma Arc Applications in Metal Cutting and Surface Treatments	International Seminar on Precision Metal Forming 18-19, Nov.96 organised by IMTMA.
6.		Evaluation of Dynamic Fracture Toughness of MIs Matched Steel Weldments	International Welding Conference & National Welding Seminar of IIW Bombay
7.		Effect of Ferroalloy Additions in Agglomerated Flux on the Submerged Arc Weld Metal Properties	International Welding Conference, IIW 5-7, Dec.96
8.		Materials Joining Education for 2000 A.D.	International Welding Conference, IIW 5-7, Dec.96
9.	K.A Padmanabhan	Formability of Sheet Steels (National Metallurgists' Day)	BHEL, Trichy 6.12.96
10.		Low Cycle Fatigue of AISI 304 Austenitic Stainless Steel (Golden Jubilee Lecture)	IISc., Bangalore 27.02.1997
11.	S.Sundaresan	Welding Processes and Procedures with respect to Aluminium	IISc.Bangalore 10.5.96
12.		a.Weldability of Al.alloys & Ti.alloys. b.Welding of dissimilar materials	IGCAR, Kalpakkam 26.9.96
13.		Welding of austenitic, ferrite and duplex stainless steels	NMD Jubilee Function of IIM Salem 31.1.97
14.		Welding Metallurgy of oil pipeline steels	W.R.I.Trichy 8.3.97
15.	P.Venugopal	Some facets of advances in metal forming	DST, SERC IIT Madras June, 1996
16.	Paramanand Singh	Engineering Materials and Processes	National Inst. of Fashion Tech.Madras Oct.7-14,1996

3.5 Visits Abroad by Faculty:

S.No.	Name of the Faculty	Country visited	Date	Purpose of Visit
1.	Prof.O.Prabhakar	Singapore	6.1.95- 5.1.97	Visiting Senior Fellow
2.	Dr.K.Swaminathan	Hong Kong	9.10.95- 11.11.96	Post Doctoral Research Fellowship

3.6 Honours and Awards:

S.No.	Name of Faculty	Honours/Awards	Purpose
1.	S.Sundaresan	D.M.Panthaki Award (IIW)	Best paper in non-process welding presented at National Welding Seminar
2.	P.Venugopal	Member, International Advisory Panel, Annual event of ASIA PACIFIC Conference	Based on many research papers contributed to the Journal of Matls.process technology
3.	P.Kesavan Nair	Best Paper Award	Best technical paper presented during National Symposium of Research Scholars July, 1996
4.	Paramanand Singh	Citation & Cash Prize	-do-

3.7 Books/Monographs Published:

S.No.	Name of Faculty	Title	Publisher
1.	D.R.G.Achar J.Ruge and S.Sunderesan	ALUMINIUM - MONOGRAPHIE: Verbinden von Aluminium mit Stahl, besonders durch Schweissen : Joining Aluminium to Steel, with particular reference to welding	ALUMINIUM VERLAG GMBH, Duesseldorf, Germany, 1981, 17 Tables, 32 Figures, 32 Pages.

3.8 Patents Awarded:

Prof K A Padmanabhan:

1. A patent for the `Development of a Process to melt, cast and Roll an Aluminium Alloy Equivalent to AFNOR 7020 to obtain Propeties stipulated by Indian Space Industry.
2. Another patent for `Development of a suitable Thermo mechanical Treatment to Induce Superplasticity In a Laboratory made Aluminium Alloy Equivalent to AFNOR 7020.

3.10 Memberships/Fellowships in Professional Bodies:

Name of the Faculty	Membership/Fellowship	Professional Bodies
Dr.D.R.G.Achar	Member	Americal Welding Society, USA
Dr K A Padmanabhan	Fellow	Indian National Academy of Engineering
	Fellow	Indian Academy of Sciences
	Fellow	Indian Institute of Metals
	Fellow	Institution of Engineers
	Fellow	Institute of Materials, London
	Member	Materials Research Society of India
	Honorary Academician	Bashkirian Academy of Sciences, Russia
Dr.O.Prabhkar	Life Member	IIM
Dr.S.Sundaresan	Member	IIM and IIW
Dr.S.K.Seshadri	Life Member	IIM , SAEST, M.M.S.
Dr.P.Venugopal	Member	Fluid Power Society of India
Dr.K.Prasad Rao	Life Member	IIW and IIM
Dr.S.D.Pathak	Life Member	ISTE; Life Member IIM
Dr.S.Raghavan	Active Member	New York Academy of Sciences
Dr.Paramanand Singh	Annual Member	American Powder Metallurgy Institute (APMI International) 1996
Dr.K.Swaminathan	Member	Indian Institute of Metals T.M.S. Society, USA
Dr.B.Guha	Member and Treasurer	IIM
Dr.V.Sampath	Life Member	IIM
Dr S S Bhattacharya	Member	IIM
Sri S Annamalai	Member	Fluid Power Society of India P/M Association of India
Sri G.Jothinathan	Life Member	Indian Society for Non-Destructive Testing
	Co-Treasurer	National Governing Council Indian Soc. for Non Destructive Testing

4. Design and Development Activities:

4.1 Brief and specific details of process/instrument/equipment/software designed and developed:

Dr.P.Venugopl:

1. V & U Diebending Unit for Bending Investigations (AICTE 1996 Sponsored)
2. Ironing Tool Equipment for Friction Prone Materials (AICTE 1996 Sponsored)
3. Floating die compaction tools and open die extrusion tools (DST 1996 Sponsored)
4. Compaction tools for sintering of P/M sheets for bending characterisation

Dr.S.D.Pathak:

1. Design and Fabrication of fixture to ascertain mixed mode fracture and crack growth behaviour

Dr.S.Raghavan:

1. Design and Development of Magnesium Sensors in Aluminium melts using MgF₂ solid electrolyte

Dr.Paramanand Singh:

1. Vacuum Degassing unit developed and fabricated

4.2 New Facilities Added and Major Equipment Procured:

1. A Pentium Personal Computer (PC) was added by purchase from an Indo-US Project
2. Networking of all PCs in the lab was completed under a Steel Authority of India Ltd Project
3. A Schenck - Instron Low Cycle Fatigue Testing bought under an Indo-German Project was commissioned.
4. An Y1, Y2 - L Recorder (Rs.1.2 lakhs)
5. A Purifier type sintering furnaces (Rs.5.36 lakhs)
6. Sintering Furnace
7. Optical Replica Technique for insitu study of short crack and crack growth behaviour.
8. High energy attritor mill

5. Research and Consultancy:

5.1 Sponsored Projects on hand (only on going)

S.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Co-ordinator(s)
1.	Fusion and grain refinement in Al. & Ti alloys	1994-97	ARDB	5.85	S.Sundaresan

S.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Co-ordinator(s)
2.	Welding of duplex stainless steels	1995-98	AICTE	3.00	S.Sundaresan
3.	Welding procedure for steam generator transition joints	1996-99	BRNS	10.21	-do-
4.	Modernisation of Metal Forming Lab. with Ironing and bending tooling equipment	1996-2000	AICTE	8.00	P.Venugopal
5.	Open die extrusion of sintered iron P/M preforms	1996-2000	DST	18.69	-do-
6.	Application of Electron Beam Welding Techniques in Ti-6Al 4V alloy	1995-98	ISRO IITM	3.99	Dr.K.Prasad Rao Dr.B.Guha
7.	Evaluation of texture profiles in extra-deep drawing A.K.sheet steel by the ODF technique and the mathematical modelling of ADs from ODF data	1993-96	SAIL Ranchi	6.21	Prof.K.A.Padmanabhan Dr.K.Swaminathan
8.	Fundamental Studies In Superplasticity & High temperature Creep	1993-97	Indo-US	10.86	Prof K A Padmanabhan Dr S S Bhattacharya
9.	Fatigue of Micro alloyed Steels	1995-98	Volkswagen Foundation	11.76	Prof K A Padmanabhan Dr S S Bhattacharya
10.	Multi-axial Testing for Materials Forming Applications	1996-99	Indo-Russia	4.37	Prof K A Padmanabhan Dr S S Bhattacharya
11.	Computer Aided Simulation and Computer Aided Design and Engineering in Welding Technology	4 Years	DST	12.04	Prof.D.R.G.Achar Dr.B. Guha

- | | | | |
|----|--------------------|--|---------------------------|
| 2. | Dr K A Padmanabhan | Improving the Forming characteristics of sheet steel | Tube Products of India |
| 3. | Dr.S.D.Pathak | | Kartik Steels Ltd. Madras |
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5.5 Research Publications:

Journals - International and National

1. S Ganesh Sundara Raman and K A Padmanabhan, International Journal of Fatigue, 18 (1996) 71-79 'Effect of Prior Cold Work on the Room Temperature Low Cycle Fatigue Behaviour of AISI 304 LN Stainless Steel'
2. K.A Padmanabhan and J.Schlipf, Materials Science and Technology, 12 (1996) 391-399 'A Model for Grain Boundary Sliding and its Relevance to Optimal Structural Superplasticity: 1. Theory.
3. V.V Astanin, S.N. Faizora and K.A Padmanabhan, Materials Science and Technology, 12(1996) 489-494. 'A model for Grain Boundary Sliding and its Relevance to Optimal structural Superplasticity: 2. Evidence for Cooperative Grain/Interphase Boundary sliding and plane Interface Formation.

5.2 Industrial Consultancy (only on going)

S.No.	Title	Industry	Value in thousands	Co-ordinator
1.	Formability of Low Nickel Stainless Steel	Indian Stainless steel Development Association	2,00,000	K.A Padmanabhan Dr K Swaminathan is an Investigator)
2.	Failure Analysis	Nagarjuna Fertilisers	30,000	S.Sundaresan
3.	Microstructural Characterization	Tube Products of India	35,000	S.Sundaresan
4.	Failure Analysis	Rane Brake Linings	10.500	S.Sundaresan
5.	Design and Tech. advice	M/s Natesan Industries, Madras.	7500	P.Venugopal
6.	Fatigue of shot peened chains	T.I.Diamond Chain, Madras	60,000	S.D.Pathak
7.	Stress rupture of super alloys	Kartik Steels	28,000	S.D.Pathak
8.	Quantitative x-ray diffraction Analysis of hydrochloride	Shasun Chemicals	70,000	P.K.Nair
9.	Strength of welded Plates	Hindustan Steel Works Ltd.	54,000	Dr.B.Guha
10.	Failure Analysis	Madras Refinerles Ltd. Madras	35,000	Dr.D.R.G.Achar

5.3 RBIC (only on going)

S.No.	Name of the Investigator/Co-Investigator	Number	Value (In lakhs)
1.	Dr.S.D.Pathak	CTOD of steels	3.00
2.	Prof.K.A.Padmanabhan Dr.K.Swaminathan	1	6.00 (over 3 years)

5.4 Retainer Consultancy (only on going)

S.No.	Name of Faculty	Title	Industry
1.	Dr K A Padmanabhan	Formability of Low Nickel Stainless Steels	Indian Stainless Steel Development Association

4. Astanin, K.A Padmanabhan and S.S. Bhattacharya, *Materials Science and Technology*, 12(1996) 545- A model for Grain Boundary Sliding and its Relevance to Optimal Structural Superplasticity: 3. The Effects of Flow Localisation and specimen Thickness on Superplasticity in Alloy Supoal 100'
5. T A Venkatesh, S S Bhattacharya, K.A Padmanabhan and J.Schllpf, *Materials Science and Technology*, 12 635-643 'A model for Grain Boundary Sliding and its Relevance to Optimal Structural Superplasticity: 4. Experimental Verification'
6. K A Padmanabhan, O.Engler and K Luecke, *Journal of Materials Science*, 31 (1996) 3971-3981 'On the Effects of Second Phase Distribution on the Fracture Behaviour of Two Superplastic Aluminium Alloys.
7. B.R.Sridhar, K Ramachandra and K A Padmanabhan, *Journal of Materials Science*, 31 (1996) 4381-4385. 'Effects of Cyclic Stressing, Heat-Treatment and Shot-Peening Pressure on the Residual Stress Distribution of Two Titanium Alloys'.
8. B.R Sridhar, K Ramachandra and K A Padmanabhan, *Journal of Materials Science*, 31(1996) 5953-5960. 'Effect of Shot-Peening on the Fatigue and Fracture Behaviour of Two Titanium Alloys'
9. Sheng Cha, R.Nitsche, K A Padmanabhan and H.Haln, *Journal of Materials Science Letter*, 16 (1997) 74- 'On a Pneumatically Controlled Tension/Compression Testing System'.
10. V Subramanya Sarma and K A Padmanabhan, *International Journal of Fatigue*, 19(1997) 135-141.
11. Tribomechanical properties of cobalt-silicon nitride composite costings, E.P.Rajiv, A.Iyer and S.K.Seshadri *Surface Engg.* 1996, 12(2), 163-166.
12. Pulsed electrodeposition of nickel G.Dévaraj and S.K.Seshadri, *Plating and Surface Finish*, (June), 83(6), 62-66.
13. Polarisation and passivation properties of cobalt composites, Amita Iyer, E.P.Rajiv and S.K.Seshadri, *Bull. Electrochem.*, 1996, 12(1-2), 45-47.
14. Tribological properties of cobalt ceria composite coating, Amita Iyer, E.P.Rajiv and S.K.Seshadri, *Bull. Electrochem.* 1996, 12(5-6), 291-293.
15. Stress Rupture behaviour of Super alloy 718 EB welds, Ch.Radhakrishna, K.Prasad Rao, M.C.Pandey, *Trans.Indian Inst. of Metals*, Vo.49, No.4, Aug. 96, pp.413-417.
16. Bead-over-bead Techniqe in EB welded TigA14V, Ch.Radhakrishna, J.Raghuram Reddy, K.Prasad Rao, *Practical Metallography (German)*, Vol.31, Dec.1996,pp.618-628
17. Some studies on the Impact Behaviour of Bavieted Micro-alloyed Steel, Dr.S.D.Pathak, *Engg. Fract. Mechanics*, V.53, 991-1005, No.6, 1996.
18. Ultrasonic Velocity Measurement to Assess Casting quality Dr.S.D.Pathak, *Insight (UK)* V38, No.7, (7 pages)
19. Gibbs free energy of formation of Ca_2CuO_4 using a CaF_2 solid electrolyte galvanic cell, S.Raghavan, *J.Alloys and Compounds*, 232(1-2) L20-21 (1996)

20. Studies on Crystallisation of Electroless Ni-P Deposits, P.Sampath Kumar and P.Kesavan Nair, J.Materials Processing Technology, 56 pp.511-520 (1996)
21. Influence of Powder characteristics and relative Humidity on the Bulk properties of the copper powder, Paramanand Singh and P.Ramakrishnan, Trans.AmAI, Vol.23, Dec.1996.
22. Effect of Sn on the properties of Fe-Cu-Ps-Mos2 Antifriction alloy" M.Chandrasekaran and Paramanand Singh, Int.J.Powder Met. 32(4)_323-330, 1996.
23. Powder Characterisation of particle Shape assessment, Paramanand Singh and P.Ramakrishnan, KONA No.14,26-30,1996.
24. Percentage porosity measurement by a through transmission ultrasonic technique, O.Prabhakar, R.Ambardar and Heng Keng Wah, British Journal of Non-destructive Testing, INSIGHT, Feb.1997.
25. Simultaneous optimisation of flame spraying process parameters for high quality molybdenum coatings using taguchi methods, M.Vijaya Babu, R.Krishnakumar, O.Prabhakar and N.Gowrishankar, Surface Coatings Technology, 79(1996), pp.276-288.
26. Fracture mechanics approaches to coating strength evaluation, M.vijaya Babu, R.Krishnakumar, O.Prabhakar and N.Gowrishankar, Engineering Fracture Mechanics, V.55, No.2, (1996) pp.235-248.

(B) Conferences - International and National

1. Achar D.R.G., "Introduction to Aluminium Joining", an invited paper presented at the National Workshop on Joining of Aluminium, 10.5-11.5.1996, Bangalore, Aluminium Association of India, also Published in the Journal ALUMINIUM, Jan, 1997.
2. Bharathan V. and Achar D.R.G., "Computer Aided Selection of Stainless Steel Filler Materials", Proc. of National Symposium of Research Scholars On "Metals and Materials Research", 4-5 July 1996. IIM Madras Chapter & IIT Madras.
3. Angamuthu K, Guha B and Achar D.R.G, Dynamic Fracture Toughness Behaviour of HAZ of Q & T Steel Weldments, Proc. of International Symposium on Joining of Materials (SOJOM '96), 12-14 Sept, 1996, Trichy, India, B 017 - B023.
4. Achar D R G, Latest Trends and Developments in Metal Joining Technology, Invited Paper Presented at the TECHNOLOGY SUMMIT '96, 11-12 October 1996, Hyderabad, India, organised by C11 & IMTMA. Achar D R G, Plasma Arc Applications in Metal Cutting and Surface Treatments, Invited paper
5. presented at the International Seminar on Precision Metal Forming, 18-19 November, 1996, Mumbai,
6. India, organised by IMTMA. Angamuthu K, Guha B, and Achar D R G, Evaluation of Dynamic Fracture Toughness of Mis Matched Steel Weldments, Proc. of the International Welding Conference, 5 - 7 December, 1996, Mumbai, IIW, p.A-003-1-12.
7. Dhandapani K P, Achar D R G and Raghupathy V P, Effect of Ferroalloy Additions in Agglomerated Flux on the Submerged Arc Weld Metal Properties, Proc. of the International Welding Conference, 5- 7 December, 1996, Mumbai, IIW, p.A034-1-8.

8. Achar D R G., Materials Joining Education for 2000 A.D, Invited Paper presented at the International Welding Conference, 5-7 December, 1996, Mumbai. IIW,p.I-014-1-5.
9. Bhattacharya and K A Padmanabhan, Proc.Int.Symp. on 'Hot Workability of Steels and Light Alloys - Composites', Eds.4, J.McQueen, E.V. Konoplova and N.D. Ryan, Met.Soc. Canada, Institute of Mining, Metallurgy and petroleum, Montreal, Canada, 1996, pp. 105-112. 'Numerical Verification of a mechanistic
10. model for Boundary Sliding Controlled Optimal Superplastic Flow' 'Towards a Theory of Cooperative Deformation Processes: The Case of Flow in Optimally Superplastic and Nanostructured Materials' K A Padmanabhan, International Conference on Superplasticity in Advanced Materials - ICSAM, 97, Ed.A.H. Chokshi, Trans. Tech. Publications, Aedermannsdorf, Switzerland, 1997, pp. 1-10.
11. 'On the Numerical Verification of a Mechanistic Model for Superplastic Flow' S.S.Bhattacharya and K.A Padmanabhan, International Conference on Superplasticity in Advanced Materials - ICSAM 97, Ed. A.H. Chokshi, Trans.Tech. Publications, Aedermannsdorf, Switzerland, 1997, pp. 59-64.
12. 'On the Apparent Activation Energies for Superplastic Flow' S.S. Bhattacharya and K A admanabhan, International Conference on Superplasticity in Advanced Materials - ICSAM 97, Ed. A.H. Chokshi, Trans.Tech. Publications, Aedermannsdorf, Switzerland, 1997, pp. 65-70.
13. 'Evolution of Microstructure and Homogeneity in Superplastic Deformation' B.Bingzhe and K A Padmanabhan, International Conference on Superplasticity in Advanced Materials - ICSAM 97, Ed. A.H. Chokshi, Trans.Tech. Publications, Aedermannsdorf, Switzerland,1997, pp.191-198.
14. The influence of Impurity element content and solidification mode on hot cracking of austenitic stainless steel weldments, S.Sundaresan, Proc. Nat.Symposium of Research Scholars, IIT Madras, pp.140-149, July 1996.
15. Phase transformations in welded alpha-beta titanium alloys as a function of composition, cooling rate and post-weld heat treatment temperature, S.Sundaresan, Proc.Symposium on Joining of Materials (SOJOM), IIW Tiruchirappalli, pp.B.071-B079, Sept. 1996.
16. Effect of nitrogen on fusion zone cracking in type 316 L Stainless steel weldments, S.Sundaresan, Proceedings International Welding Conference IWC 1996, Bombay, pp. A055-1 to A055-6, Dec.1996.
17. Effect of Post weld heat treatment temperature on the mechanical properties of alpha-beta titanium alloy welds, S.Sundaresan, Ibid, pp.A066-1 to A066-8
18. Electrochemical behaviour of cobalt-zirconia electro-composites in various electrolytes, Amita Iyer and S.K.Seshadri, Int. Conference MICMAP-96, Baroda, Jan. 1996.
19. Corrosion resistance of Ni-P-Si₃N₄ composite coating J.N.Balaraju, S.K.Seshadri and S.R.Iyer, 16th National Congress on Corrosion control, Calcutta, 22-24, May 1996.
20. Oxidation resistance of cobalt and cobalt-BN composites Iyer, A and S.K.Seshadri, Sixth National Congress on Corrosion Control, Calcutta, 22-24, May, 1996.
21. Corrosion resistance of Ni-P-CeO₂ composite coatings, J.N.Balaraju, S.K.Seshadri and S.R.Iyer, 8th ATM of IIM New Delhi, 14-17 Nov. 1996.

22. Anti-wear properties of cobalt-zirconia electrocomposites Amita Iyer and S.K.Seshadri, 50th ATM of IIM, New Delhi, 14-17, Nov. 1996.
23. Pitting Corrosion Behaviour of Age-hardenable Al-alloys, Y.V.Sai Raman, R.Valli, K.S.Raghavan, K.Prasad Rao, International Symposium on Joining of Materials (SOJOM), Tiruchirappalli, Sept.12-14, 1996.
24. Microstructural aspects of Semi-austenitic 17-7 PH SS Welds J.Raghurami Reddy, K.Bhaskar Rao, K.Prasad Rao, International Symposium on Joining of Materials (SOJOM),
25. Corrosion and Microstructural Studies of PGTA Welded Al-Li alloy, N.Narendra, G.Madhusudan Reddy, K.S.Raghavan, K.Prasad Rao, International Symposium on Joining of Materials (SOJOM 1996), Tiruchirappalli - Sept.12-14,1996.
26. Effect of Pulsing Frequency on GTA welded Al-Li alloy G.Madhusudan Reddy, Gokhak, K.Prasad Rao, International Symposium on Joining of Materials (SOJOM)1996),Tiruchirappalli
27. Fatigue Crack Growth Behaviour of Banded Microalloyed Steel and its MMA weldment, S.D.Pathak, Int. Welding conference, IWC 96, Mumbai 5-7 Dec.1996
28. Ultrasonic Measurements on Al-Cu Alloy Castings, S.D.Pathak 14th World Conf. on NDT. Dec.1996.
29. Solid State Electrochemical sensors and their Industrial Applications S.Raghavan, Symposium of Electrochemistry In Metallurgy and Materials Science, Aug.21-23, IISc.Bangalore.
30. XRD Studies on Solid State Amorphisation in Electroless Ni/P Deposits, P.Sampath Kumar, P. Kesavan Nair, Proc.Asian Conf. on X-rays and Related Techniques in Research and Industry (ACXRI 1996), IPOH, Malaysia, June 6-8, 1996.
31. Control of Residual Stress and Distortion by Weld Sequence Method in Welded Railway Bogie Frames, S.Suresh,S.S.Ananthan V.P.Raghupathy, P.Soundararajan, P.K.Nair and R.Vasudevan Proc.Symposium on Joining of Materials (SOJOM 1996), Sept.12-14, Tiruchirappalli, 1996 pp.H019(1996)
32. An Investigation on the influence of Thermal relief of Micro Residual Stresses Induced by Surface Grinding and its Influence on the Corrosion Behaviour of High and Medium Carbon Steel, A.S.Varadarajan, B.Ramamoorthy and P.Kesavan Nair, Proc.,International Conf.on Advances in Mechanical and Industrial Engineering, Feb.6-8, Roorkee, pp.733-740 (1997)
33. Influence of Filler Material with Dissimilar Composition and Microstructure on Residual Stress and Distortion in Welding S.Curesh, V.P.Raghupathy, G.Venkataraman, P.K.Nair, R.Vasudevan, National Symposium of Research Scholars on Metals and Materials Research, IIT Madras, July 4-5, 1996. pp.128-139(1996).
34. Effect of Residual Stresses on Corrosion Behaviour of Ground Components, K.Hariprasad Reddy, B.Ramamoorthy and P.Kesavan Nair, 17th All India Manufacturing Technology Design Research Conference (AIMTDR) Warangal, Jan. 9-11, 1997.
35. Influence of Powder Characteristics and Relative Humidity on the Bulk properties of the Copper Powders, Paramanand Singh and P.Ramakrishnan, 22nd Powder Met. Conf. Bangalore April 26-27, 1996.

36. MorphoLogical Characterization of Powders, Paramanand Singh and P.Ramakrishnan 22nd Powder Metallurgy Conf."Bangalore April 26-:7, 1996.
37. Studies on Sintered 201 and 601 Al-SiCp composites, Paramanand Singh and Ch.Nageswara Rao, 5 th ATM of IIM, Nov., 16-17, 1996.
38. Study and Characterization of Al (7075)-SiC particulate composites Developed by Hot Extrusion, Sankar, R. and Paramanand Singh, 50th ATM of IIM, Nov. 16-17, 1996.
39. Sintered INickel Steel composite for automotive structural parts, P.Umesh and Paramanand Singh, Int.Conference and Exhibittinn on Powder Metallurgy for Automotive Componenus P/M 97 and 22nd Annual Technical Meeting of PMAI, Feb.10-12, 1997.
40. Modelling Sheet Metal fracture limits for Hill's Yield locus, K.Swaminathan, Proceedings of the Third Asia Pacific Symposium on Advances In Engineering Plasticity end Its Application AEPA(1996), 21-24, Aug. 1996, Hiroshima, Japan, pp.661-666.
41. Fatigue life prediction of Welded cruciform joints, V.Balasubramanian and B.Guha, XII Nat. Convention of Mech.Engrs. Jan.31st-Feb.2, 1997, Inst. of Engineers, Allahabad.
42. Studies on Friction and Wear charaseristics of non-asthas based friction composites, V.Sampath, V.Sethuraman and N.G.Nair, Proceedings of the Second International Conference on Advances In composites, Bangalore Dec.1996.-

6. Distinguished Visitors to the Department (Important dignetories above the level of Professors only)

S.No.	Name of the Visitor and Designation	Date of Visit	Purpose of Vlsit (Lecture/Discussion)
1.	Dr.Sreesramesh Kalluri NYMA INC. Cleveland, OHIO, USA	13.5.96	lecture on "Estimation of Fatigue life under axial torsional loading" Participants:16, MSB 104, II Madras
2.	Prof.Hem Shanker Ray Director, PRL, Bhubaneswar	6.6.96	Lecture on "Use of Thermal Analysis" No. of Participants:21, Venue: MSB 104, IIT Madras
3.	Dr K.S. Ramesh Senior Scientist Battelle Pacific Northwest National Lab., Richland WA 99352-9668	24.6.96	Lecture on "Materials for Advanced Gas Turbine" No.of participantr: 17, Venue: MSB 104, IIT Madras.
4.	Mr.Tushaar Mehta 40 Thirumalai Pillai Road, T. Nagar, Madras-17	23.9.96	Lecture on "Gold and the Jewellery Industry" No.of participants: 29 , Venue: MSB 104, IIT Madras

S.No.	Name of the Visitor and Designation	Date of Visit	Purpose of Visit (Lecture/Discussion)
5.	Dr. Klaus Roessler GTZ-Project, Welding Reseavch Laboratory, BHEL, Trichy-620 014	3.10.96	Lecture on "Joining of materials in monumends by forging etc. in olden days" No. of participants:29, Venue: MSB 104, IIT Madras
6.	Dr.Hans Fredrik Nordberg Director The Avesta Sheffield" AB Research Foundation, Sweden	8.11.96	Evening Technical Lecture on "Trends In the Developmdnts of Stainless Steels in Western Europe" No. of Participants:44, Venue:Connemara Hotel, Madras
7.	Dr Hans Fredrik Nordberg Director, The Avesta Sheffield AB Research Foundation Sweden	11.11.96	Lecture on "Mechanical properties of Austenitic and Duplex Stainless Steel" No. of participants:25, Venue:IIT Madras
8.	Prof.Gareth Thomas, University of California, Berkeley, USA	19.11.96	Lecture on "Meso/Microstructure design of Advanced Materials" No. of participants: 33, Venue: IIT Madras, MSB 104.
9.	Dr.Gerd Dobmann Fraunhofer Institut Zerstörungsfreie Prüfverfahren, Saarbrucken, Germany	17.12.96	Lecture on "Life assessment of pressure vessels through NDT Techniques" No. or Participants:26, Venue: MSB104, IIT Madras
10.	Dr.W.Arnold Fraunhofer Institut Zerstörungsfreie Prüfverfahren, Saarbrucken, Germany	17.12.96	Lecture on "NDT of Adhesive Bonds" No. of participants:26, Venue:MSB 104, IIT Madras
11.	Dr G.V.Srinivasan, Carborundum Company, New York, USA	18.12.96	Lecture on "Application of Fractography in Ceramic Fibre Development and Testing" No. of participants: 14, Venue: MSB 104, IIT Madras.
12.	Mr.Srinivas Atreya University of Alabama USA	26.2.97	Lecture on "Effect of Magnetic fields in suppression of Buoyancy - Driven convection during melt crystal growth, No. of Participants:20, Venue: MSB 104, IIT Madras

4.12 Ocean Engineering Centre

1 Introduction

Ocean Engineering Centre was established in 1977. Now, Ph.D., M.S., M.Tech. in Ocean Engineering and B.Tech. in Naval Architecture Programmes are being offered. The major areas of teaching and research at the Centre are:

- Structural analysis, Design and Testing
- Wave Hydrodynamics
- Floating and Submerged Bodies
- Marine Geotechniques
- Materials In Ocean Environment
- Ocean Energy
- Naval Architecture
- Sea bed mining
- Underwater Instrumentation

2. Academic programmes:

2.1 New Courses Introduced

Sl. No	Course No.	Title	Structure	Faculty
1	OE 798	Computer aided Surface Development for Marine Vehicles	3-0-0-3	Dr.V. Anantha Subramanian
2	OE 799	Advanced Marine vehicles	3-0-0-3	Dr.R. Natarajan

2.2 Students on Roll (as on 30th September, 1996)

Programme	I Year	II Year	III Year	IV Year	V Year	Total
B.Tech.	21	19	20	19	-	79
M.Tech.	8	11	-	-	-	19
M.S.	5	1	4	-	-	10
Ph.D.	-	8	5	7	6	26
Total	34	39	29	26	6	134

2.3 Number of Scholarships/Fellowship holders (as on 30th September, 1996)

Programme	Institute Scholarship	Others	Total
M.Tech.	8	--	8
M.S.	3	--	3
Ph.D.	9	1 (QIP)	10
Total	20	1	21

2.4 Number of Degrees Awarded in the last Convocation

Programme	Number
B.Tech.	19
M.Tech.	11
M.S.	1
Ph.D.	5
Total	36

3. Faculty and their Development

3.1 Name of the Faculty

Name and Qualifications	Specialization
Professors	
M.R.Pranesh, Ph.D.(IISc.,) Head	Structure-, soil-wave interaction studies, Coastline studies, Behaviour of materials in ocean environment
V.S. Raju, Dr.Ing.(Karlsruhe) (on lien to IIT, Delhi as Director)	Marine geotechnical Engineering, Foundation design for onshore and marine structures, Ocean Engineering
C. Ganapathy, Ph.D.,(IIT, Madras)	Analysis and design of offshore and ship structures
M. Ravindran, Ph.D.(IIT, Madras) (on lien to NIOT, Madras as Executive Director)	Turbomachines, pumps, Hydraulic turbines, Ocean Energy
S. Narasimha Rao, Ph.D.(IISc.,)	Marine Geotechnical engineering, Seabed soil characteristics under static and dynamic loads
C.P. Vendhan, Ph.D.(IIT, Kanpur)	Computer aided analysis, of ,ocean, Civil and Aerospace structures, Dynamics of floating bodies and structures
K.Muthukrishnaiah,Ph.D.(IIT, Madras)	Marine geotechnical engineering, Analysis and civil & aerospace structures, Dynamic of design of foundation for offshore and onshore structures
Prof..K. Ganesh Babu, Ph.D. (IIT, Madras)	Analysis and design of ocean structures, Behaviour of Material fatigue and in Ocean Environment
V. Sundar, Ph.D.(IIT, Madras)	Wave-structure Interaction, Coastal Erosion and shore protection, Fluid flow problems

Name and Qualifications

V.G. Idichandy, Ph.D.(IIT, Madras)

SP.Subramanian, Ph.D.(Madras)

R. Mahadevan, Ph.D.(IISc)

Associate Professors

K. Rajagopalan, Ph.D.(IIT, Madras)

R. Sundaravadivelu, Ph.D. (IIT, Madras)

R. Natarajan, Ph.D. (IIT, Madras)

S.K. Bhattacharyya, Ph.D. (IIT, Madras)

J.S. Mani, Ph.D.(IIT, Madras)

Assistant ProfessorsP. Sambandan, M.S.(IIT, Madras)
(on lien to NSDRC, Visakhapatnam as
Director)wazzu

S. Neelamani, Ph.D. (IIT, Madras)

Paul Mario Koola, Ph.D.(IIT, Madras)

V. Anantha Subramanian, Ph.D. (IIT, Madras)

S. Surendran, Ph.D.(Japan)

SpecializationExperimental techniques, Instrumentation,
Analysis and testing of structural models and
prototypesGeological oceanography, Engineering geology
Physical Oceanography, Ocean wave
hydrodynamicsComputer aided analysis, Design of ship,
underwater and offshore structures, Reinforced
and prestressed concrete structures
Computer aided analysis, design and
experimental studies of coastal and offshore
structuresShip Hydrodynamics, Design of small crafts,
Model testing of launches, tugs, trawlers etc.,
Mooring analysis of floating structures
Computer aided structural analysis, Analysis of
motion floating bodies, Model studiesHydraulic and numerical modeling of Coastal
and offshore ProcessesShip design, ship structures, Computer
Applications in ship designExperimental and theoretical hydrodynamics,
Wave structure Interaction, Wave energy, Fluid
MechanicsWave energy, Hydrodynamics, Oceanographic
measurementsNaval Architecture, Ship model testing
Naval Architecture, Dynamics of mooring and
towing**3.2 Short-term courses/Workshops/Seminars/Symposium/Conferences organised by the Department**

Sl.No	Coordinator(s)	Title of Workshop/Seminar/ Symposium/ Conference	Period
1.	Prof.S. Narasimha Rao	Short Term Training Programme for Personnel from Dredging Corporation of India at Kakinada	27-31.Jan.1997
2.	Prof.C.P.Vendhan	Second Technical Sessions of the Madras- India Regional Chapter of the Acoustical Society of America	18-19 Aug. 1996

Sl.No	Coordinator(s)	Title of Workshop/Seminar/ Symposium/ Conference	Period
3.	Prof.C.P.Vendhan Vice Chairman	International Conference in Ocean Engineering	17-20 Dec. 1996
4.	Prof.V.G. Idichandy Organising Secretary (General)	International Conference in Ocean Engineering	17-20 Dec. 1996
5.	Prof.V.G.Idichandy Convenor	TECH-21 An Industrial exhibition and symposium organised by IIT Madras	13-16th Jan. 1997
6.	Prof.SP. Subramanian	Coastal Zone Management Sponsored by IOI Operational Centre, India	October, 1996
7.	Prof.SP. Subramanian	Deep seabed Mining Sponsored by Nippon Foundation, Japan & IOI Operational Centre, India	July-Aug. 1996
8.	Prof.V. Sundar Organising Secretary (Publication)	International Conference in Ocean Engineering	17-20 Dec., 1996

3.3 Short-term courses/ Workshops /Seminars/ Symposia/ Conferences/ Training attended by the Faculty in recognised Academic Institutions and Public Sector Units

Sl.No.	Name of Faculty	Title	Period/Duration
1	Prof.V.Sundar	National Conference on Partnerships for Development Ports	8-9 April, 1996
2.	Dr.R.Sundaravadivelu	10th Congress of APD-IAHR	26-29, Aug '96

3.4 Special Lecture(s) Delivered by the Faculty in other Institutions

Sl.No.	Name of Faculty	Topic of Lecture	Venue and Date
1.	Prof.M.R.Pranesh	Advance technology in special foundations	National Council for Cement and Building Materials 17-21 February, 1997
2.	Prof.C.P. Vendhan	Finite Element method applied to Fluid Structure Interaction and Buckling problems	NSTL, Visakhapatnam, September, 1996
3.	Paul Mario Koola,	"Wave Energy: Potential and progress in India", World Renewable Energy Congress	Denver, U.S.A., June 14-21, 1996.

3.5 Visits abroad by faculty

Sl.No	Name of Faculty	Country visited	Date	Purpose of visit
1.	Prof.S. Narasimha Rao	USA	25.5.96 to 2.6.96	To attend 6th International Conference ISOPE at Los Angeles, U.S.A.
2.	Prof.V.Sundar	Germany	2.6.96 to 19.7.96	Under Volkswagen Project
		Germany	4th May-4th July,1996	Under joint Project
		Malaysia	August, 1996	To present two paper and to Chair a Session in an Intl. Conf.On 10th APD- IAHR.
		Seoul, Korea	Sep.1996	
		Colombo, Srilanka	Nov.,1996	To present a paper in an Intl. Conf. On The Third Asian Pacific Conference on Computational Mechanics. For discussion Paper Presentation at the 10th Con-gress of APD-IAHR
	Dr.R. Sundaravadivelu	Malaysia	August '96	To deliver Lecture at of University Sains Malaysia
		Malaysia	August September'96	To deliver Lecture at Universiti Tech. Malaysia, Kualalampur
		Malaysia	August September, '96	To deliver Lecture at National University of Singapore
	Dr.R. Sundaravadivelu	Singapore	August Septmber'96	DFG Project
4.	Dr.Paul Marlo Koola	Germany	May -July '96	To attend the 10th APD-IAHR Congress
5.	Dr.J.S.Mani	Malaysia	24th Aug.1996 to 30th Aug.1996	

3.6 Honours and Awards

Sl.No.	Name of Faculty	Honours/Awards	Purpose
1.	Prof.S. Narasimha Rao	Best paper award by Indian Geotechnical Society (3rd year in succession)	In the field of Marine Geotechnical Engineering

3.7 Patents filed

Dr.Paul Mario Koola : Self calibrating wave gauge

3.8 Memberships/Fellowships in Professional Bodies

S.No.	Name of Faculty	Membership/Fellowship
1.	Prof.S.Narasimha Rao	Member, Indian Geotechnical Society
2.	Prof.M.R. Pranesh	Fellowship Indian Geotechnical Society Member, ISTE
3.	Prof.C.P. Vendhan	Associate Member, Acoustical Society of America
4.	Prof.K. Ganesh Babu	Member, Indian Concrete Institute Member, ACCE Member, ICIRC
5.	Prof.V. Sundar	Member "The Institution of Engineers", Madras Member "International Association of Hydraulic Research", The Netherlands.
6.	Dr.R. Sundaravadivelu	Institution of Engineers (India)
7.	Dr.J.S. Mani	Member in New York Academy of Sciences, U.S.A. Life Member in Indian Society for Hydraulics, INDIA Associate Member in Institution of Engineers, Calcutta
8.	Dr.Paul Mario Koola	New York Academy of Sciences Marquis who's who in Engineering

4. Design and Development Activities

4.1 Brief and specific details of Process/Instruments/ Equipment/ Software Designed and Developed

Dr.J.S. Mani

1. Design of Y-frame floating breakwater.
2. Design of sloping porous breakwater.
3. Design of cage floating breakwater.
4. Design of suspended porous breakwater.

Dr.Paul Mario Koola

1. Wave Energy prototype development testing and monitoring:
2. Hydrodynamic design of caisson.
3. Pulsating flow air turbines.

4.2 New facilities added and Major Equipment procured

Procured Special Triaxial Cells,
Data Logger etc Under Volkswagen Foundation grant from Germany

5. *Research and Consultancy*

5.1 Sponsored Projects on hand (only ongoing)

Sl No	Title	Period	Funding Agency	Amount (In lakhs)	Coordinators
1.	Development of Inland Barger for canal system	1993-96	Inland Waterway Authority of India	6.00	Prof.C.Ganapathy Dr.V.Anantha Subramanian Dr.R. Natarajan Prof.M.R. Pranesh
2.	Application of core loaded system for offshore structures	1994-97	Tube Products of India	3.00	Prof.C. Ganapathy Dr.V. Kalyanaraman, Civil Eng.department Dr.A. Meher Prasad, Civil Eng. Department
3.	Development of Triaxial Test	1997	Volkswagen Foundation, Germany	84,000/- DM	Prof.S. Narasimha Rao
4.	Development of underwater 3-component 5 Stage velocitimeter	1995-97	NIOT DOD	18.12	Prof.C.P.Vendhan Prof.V.G.Idichandy
5.	Hydrodynamic testing and optimisation of new generation of crafts	1996-98	DST New Delhi	18.76	Prof.C.P. Vendhan Dr.V.Anantha subramanian Dr.Paul Mario Koola Dr. R. Natarajan
6.	Ocean Acoustic Tomography Studies	1996	National Institute of Oceanography, Goa	Participated	Prof.R. Mahadevan
7.	Development of Operational level Storm surge model	1996-97	National Institute of Ocean Technology, Madras	3.83	Prof.R.Mahadevan
8.	Detached Breakwater as a Shore Protection measure	1995-97	National Institute of Ocean Technology	4.18	Prof.V.Sundar

SI No	Title	Period	Funding Agency	Amount (In lakhs)	Coordinators
9.	Loads on Inclined Cylinders due to Steep Waves and Currents	1995-97	German Science Foundation (DFG), Germany	86,250 DM	Prof.V.Sundar Dr.Paul Mario Koola
10.	Reliability of ship structures Torsion of containerships	1989-96	Ministry of Surface Transport	7.24	Dr.K. Rajagopalan
11.	Structural Design and Detailing of Wave Energy Caisson	1996	National Institute of Ocean Technology	4.43	Dr.R.Sundaravadivelu
12.	Impact load on platforms above sea level due to freak waves.	1995-97	Volkswagen Foundation, Germany	DM 65,200	Dr.Paul Mario Koola
13.	Load on inclined cylinders due to steep waves and currents	1995-97	DFG, Germany	DM 86,250	Dr.Paul Mario Koola Prof.V. Sundar
14.	Wave Power Plant - Monitoring and maintenance	1995-96	National Institute of Ocean Technology	23.115	Dr.Paul Mario Koola
15.	Design and development of a variable reluctance type pressure sensors	1996-97	DRDO, Govt. of India	15.48	Dr.Paul Mario Koola Dr.V.Jagadeesh Kumar Dr.P.Sankaran Dr.P.C.Majhee
16.	Directional wave measuring buoy	1995-96	National Institute of Ocean Technology	18.86	Dr.V.Jagadeesh Kumar Dr.V.Anantha Subramanian
17.	Hydrodynamic testing and optimisation of new generation craft	1996-99	DST	18.00	Dr.Paul Mario Koola Dr. V Anantha Subramanian Prof. C.P.Vendhan Dr. V. Jagadeesh Kumar
18.	Coastal Defence Works	1996-97	Department of Ocean Development	2.5	Dr.J.S.Mani

SI No	Title	Period	Funding Agency	Amount (in lakhs)	Coordinators
19.	Data Collection along North Madras Coast for Validation of Numerical Models"	1996-97	National Institute of Ocean Technology	23	Dr.J.S. Mani
20.	Wave forces on OWC Device	1995-97	DOD	2.20	Dr.S.K. Bhattacharya
21.	Directional wave data buoy	1995-97	National Institute of Ocean Technology	18.0	Dr.V. Anantha Subramanian Dr.V. Jagadeesh Kumar Dr.Paul Mario Koola
22.	Remotely operable sea skimmer	1996-97	National Institute of Ocean Technology	2.4	Dr.V. Anantha Subramanian

5.2 Industrial Consultancy (only ongoing)

Sl.No.	Title	Industry	Value in lakhs	Coordinator
1.	Design of approach Trestle	Gopalpur Port Project	3.0	Prof.C.Ganapathy Dr.R. Sundaravadivelu Prof.V.Sundar
2.	Design of fishing harbour	Gopalpur Port Project	3.0	Prof.C. Ganapathy Dr.R.Sundaravadivelu Prof.V. Sundar
3.	Feasibility study for Harbour at Gopalapur	TATA Iron and Steels Co.,	1.0	Prof.C. Ganapathy Dr.R.Sundaravadivelu Prof.V. Sundar
4.	Dredging at Chilka Lake	Chilka Dev.Authority, Orissa	1.0	Prof.C. Ganapathy Dr.R.Sundaravadivelu Prof.V. Sundar
5.	Remedial measures for buildings	Ordinance Factory, Defence, Avadi	0.30	Prof.S.Narasimha Rao Prof.M.R. Pranesh
6.	Design of Tank Foundation	Godavary Fertilisers, Kaklnada	0.65	Prof.S. Narasimha Rao
7.	Design of Multi purpose berth	Vizag Port	9.0	Prof.P.S. Rao (Civil Engineering Dept.) Prof.S.Narasimha Rao
8.	Seawater intake system at Kovaya, Gujarat	L & T, Bombay	1.5	Prof.M.R. Pranesh Prof.V.Sundar Dr.R.Sundaravadivelu

Sl.No.	Title	Industry	Value in lakhs	Coordinator
9.	Seawater Intake system at Kovaya, Gujarat	L & T, Bombay	1.50	Prof.M.R. Pranesh Prof.V. Sundar Dr.R.Sundaravadivelu
10.	Effect of coolant water withdrawal on Pulicat backwaters	NMTPP TNEB, Ennore, Madras	4.25	Prof.M.R. Pranesh Prof.V. Sundar
11.	Studies on tidal effect in Adyar River	ESKAY DESIGNS, Madras	4.25	Prof.M.R. Pranesh Prof.V. Sundar
12.	Feasibility study on hazardous cargo handling facility near Kakinada	MKR Industries Secunderabad	3.5	Prof.M.R. Pranesh Prof.V. Sundar Prof.S.Narasimha Rao Dr.R. Sundaravadivelu Dr.R. Natarajan
13.	Hydrodynamic Testing & Analysis - HITEST	DRDL, Hyderabad	20.0	Prof.C.P. Vendhan Prof. V.G. Idichandy Dr.S.K. Bhatta charyya
14.	Pontoon - Buoy mooring Analysis	NSTL, Vizag	2.0	Prof.C.P. Vendhan Prof. V.G. Idichandy
15.	Checking the Design of Foundation	Thirumalai Chemicals Ltd., Madras	0.10	Prof.K.Muthukrishnaiah Dr.R.Ambalavanan, Civil Engineering Department
16.	Investigation and Advice	Pepsi-Cola India Marketing Company Ltd., Madras	0.25	Prof.K.Muthukrishnaiah
		N.R. Patel and Company, Madras	0.10	Prof.K.Muthukrishnaiah
		Corproation of Madras	0.25	Prof.K.Muthukrishnaiah
		Indian Corporation Ltd.,	2.00	Prof.K.Muthukrishnaiah
		Cochin Refineries Ltd.,	2.00	Prof.K.Muthukrishnaiah
		Reserve Bank of India, Madras	2.00	Prof.K.Muthukrishnaiah
		Oriental Hotels Ltd., Taj Cooromonde; Hotel, Madras	0.20	Prof.K.Muthukrishnaiah
		ADJayaveer a Pandia Nadar & Sons,	0.20	Prof.K.Muthukrishnaiah

Sl.No.	Title	Industry	Value in lakhs	Coordinator
		Talco Vaniyambadi	0.10	Prof.K.Muthukrishnaiah
		Tanners Enviro control systems Ltd.		
		Orissa Mining Corporation Ltd., Bhubaneswar	0.25	Prof.K.Muthukrishnaiah
		Geo Marine Consultants (P) Ltd.,	0.25	Prof.K.Muthukrishnaiah
17.	Investigations on the Efficiency of Silica Fune	Sun Metals and Alloys, Coimbatore	2.00	Prof.K. Ganesh Babu
18.	Assessment of the strength of Centrifuge house	SPIC, Tuticorin	0.20	Prof.K. Ganesh Babu
19.	Rehabilitation of Turbogenerator Foundation	Cethar Vessels, Trichy	0.30	Prof.K. Ganesh Babu
20.	Evaluation of design basis flood	Indra Gandhi Centre for Atomic Energy	1.8	Prof.R. Mahadevan Dr.J.S. Mani
21.	Design for Diffuser System	ABAN Constructions	0.30	Dr.R.Sundaravadivelu
23.	Sea Water Intake	Gopalpur Port Project	1.0	Prof.V. Sundar Dr.R.Sundaravadivelu
24.	Design of Deep Water Berth	Gopalpur Port Project	5.0	Prof.V.Sundar Prof.C.Ganapathy Dr.R.Sundaravadivelu Dr.S.R.Gandhi
25.	Potential Sites along Orissa Coast	Government of Orissa	0.75	Prof.V. Sundar Prof.C.Ganapathy Dr.R.Sundaravadivelu
26.	Dredging Chilka Mouth	Chilka Development authority	1.0	Prof.V.Sundar Prof.C.Ganapathy Dr.R.Sundaravadivelu
27.	Master Plan for Gopalpur	TISCO	1.0	Prof.V.Sundar Prof.C.Ganapathy Dr.S.R.Gandhi Dr.R.Sundaravadivelu
28.	DRP for GMB Port at POSITRA	FRH	8.0	Prof.V.Sundar Dr.R.Sundaravadivelu Dr.S.R.Gandhi

Sl.No.	Title	Industry	Value in lakhs	Coordinator
29.	Wave Flume Studies for Breakwater Section/Round Heads Proposed for Jalgad, Agargule, Vijaydurg & Redi Ports.	NIO, GOA	10.0	Dr.R.Natarajan Prof.V.Sundar Dr.R. Sundaravadivelu
30.	Design of sea water intake system at Naripaiyur	Entoma Hydro Systems Ltd.	2.0	Prof. M. R. Pranesh Prof.V. Sundar Dr.R. Sundaravadivelu
31.	Design of diffuser system	Aban Construction	0.5	Prof.V. Sundar Dr.R. Sundaravadivelu
32.	Analysis of Pole mast	Mazagon Dock Ltd	1.0	Prof.C. Ganapathy Dr.R.Sundaravadivelu
33.	Development of Colachel Port	Tamil Nadu Port Department	9.1	Prof. M.R. Pranesh Prof.V. Sundar Dr.R. Sundaravadivelu
34.	Development of all weather port at Gopalpur	Tata Iron and Steel Company Limited	1.0	Prof.V. Sundar Prof.C. Ganapathy Dr.R. Sundaravadivelu
35.	Design of VCM pipe line	DCW Ltd.	0.2	Prof.C. Ganapathy
36.	Design of Jetty at Hazaria	Larsen and Toubro	0.25	Dr.R.Sundaravadivelu
37.	Design of Shell Roof	Telecom	0.25	Dr.R.Sundaravadivelu
38.	Potential sites along Orissa coast	Government of Orissa	0.75	Dr.R. Sundaravadivelu Prof.C. Ganapathy Dr. V Sundar
39.	Foundation for Chimney	Madras Refinerles Limited	0.50	Dr.R. Sundaravadivelu Dr.S.R. Gandhi
40.	REIA study at Tuticorin port	RITES	0.3	Dr.R. Sundaravadivelu Prof.C. Ganapath Prof.V.Sundar
41.	Master plan for Gopalpur	TISCO	1.0	Dr. A Ramachandriah Dr.R. Sundaravadivelu Prof.C. Ganapathy Dr. S.R. Gandhi Prof.V. Sundar
42.	Container berth at Kandla Port	PEEC	0.75	Dr.R. Sundaravadivelu Dr. S. R. Gandhi
43.	DPR for GMB Port at POSITRA	FRH	8.0	Dr.R. Sundaravadivelu Prof.V. Sundar Dr. S. R. Gandhi Dr. R. Natarajan
44.	Ship motion studies	Gopalpur Port Project	1.5	Dr.R. Sundaravadivelu

Sl.No.	Title	Industry	Value in lakhs	Coordinator
45.	Wave Flume Studies for Breakwater Section / Round Heads proposed for	NIO, Goa	10.0	Prof. C. Ganapathy Dr. R. Natarajan Prof. V. Sundar Dr.R. Sundaravadivelu
46.	Training for Dredging personnel of DCI, India	Dredging Corporation of India	0.3	Dr. S.Narasimha Rao Dr. Paul Mario Koola Dr.V.Anantha Subramanian Dr.S.P.Subramanian Dr.J.S.Mani
47.	Design of a wave barrier for the Finolex Industries Ltd.	Finolex Industries Ltd	0.50	
48.	Stability report on VIP Launch Apporva	Jawaharlal Nehru Port Trust	0.40	Dr.R. Natarajan

5.3 RBIC (only on going)

Sl.No.	Name, of the Investigator/Co-Investigator	Organisation	Values (In lakhs)
1.	Prof.C.P. Vendhan Prof.V.G. Idichandy Dr.S.K. Bhattacharyya	DRDL, Hyderabad	20.0
2.	Prof.C.P.Vendhan Prof.V.G. Idichandy	NSTL, Vizagapattinam	2.0
3.	Prof.V.G.Idichandy Prof.C.P.: Vendhan	DRDL, Hyderabad	33.25
4.	Prof.V.G.Idichandy	KCP, Madras	1.25

5.4 Retainer Consultancy (only on going)

Sl.No.	Name of Faculty	Title/Industry
1	Dr.J.S. Mani	Retainer Consultant for ECC, Larsen and Toubro Ltd. Madras Year : 1995

5.5 Research Publications

a) Journals : - International

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2. Lalu Mangal, V.G. Idichandy and C. Ganapathy, "ART-based multiple neural networks for monitoring offshore platforms" Applied Ocean Research 18 (1996), pp.137-143

3. Shashikala, R. Sundaravadivelu and C.Ganapathy, "Dynamics of moored Barge under regular and Random Waves" Int.Journal of Ocean Engineering, Vol.24, NO.5, pp.401-430, 1996
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9. Veeresh, C. and Narasimha Rao, S. "Vertical Pullout Capacity of Model Batter Anchor Piles in Marine Clays", Journal of Marine Geotechnical and Geotechnology, September, 1996, Vol.14, pp.205-215
10. Narasimha Rao, S., Mallikarjuna Rao, K., and Veeresh, C. "A simplified Method of calculating the lateral load capacity of rigid piles in clay:, Ground Engineering. The Magazine of the British Geotechnical Society, November, 1996, Vol.29, No.9, pp.38-40
11. Narasimha Rao, S., and Mathew P.K. "Permeability studies in Marine clays stabilized with Lime Column, "International Journal of Offshore and Polar Engineering, U.S. September, 1996, Vol.6, No.3, pp.234-239.
12. Vendhan, C.P. and Prabavathi, C., 'Determination of Far - Field Pattern of Rigid Scatterers Using Independent Finite Element Method and Eigenfunction Expansion, Part 1: Axisymmetric Scattering' Journal of Vibration and Acoustics, Vol. 118, pp. 575-582, 1996.
13. Prabavathi,C. and Vendhan, C.P., 'Determination of Far-Field Pattern of Rigid Scatterers Using Independent Finite Element Method and Eigenfunction Expansion, Part 2 : Nonaxisymmetric Scattering', Journal of Vibration and Acoustics, Vol. 118, pp. 583-590, 1996.
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15. Ganesh Babu, K. and Prakash, P.V.S., "Efficiency of Silica Fume in Concrete", Cement and Concrete Research, 1995, Vol.25, No.6, pp.1273-1283.
16. Rajashree, S.S. and Sundaravadivelu R. "Degradation Model for One-way Cyclic Lateral Load on Piles in Soft Clay", Computers and Geotechnics. Vol. 19, No. 4, pp 289-300, 1996.
17. Shashikala, A.P. Sundaravadivelu, R. and Ganapathy, C. "Dynamics of Moored Barge under regular and random waves", Ocean Engineering , Vol. 24, No. 4, pp 401-430, 1996.

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(a) Journals - National

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2. Lalu Mangal, V.G. Idichandy, C. Ganapathy, "Art based multiple Neural Networks, for monitoring of offshore structures", Applied Ocean Research 18, 1996, pp.137-143
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(b) Conferences

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2. Narasimha Rao, S., Ramakrishna, V.G.S.T. and Babu Rao, M. "Behaviour of 2 pile group under Lateral Loads:, IGC, December, 1996 pp.290-293.
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9. Pranesh MR. and Raghava Rao M, Pressure on buried pipeline due to wave-current interaction. Proceedings, Conference on Ship and Offshore Technology, SHOT '97, March 5-7, 1997, pp.202.207

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 11. Muthukrishnalah, "Geotechnical Investigations of Sports Stadia" Proc. Indian Geotechnical Conference, IGC-96, Madras, December, 1996, pp.651-656
 12. Muthukrishnalah, "Case Studies: Damage to Buildings due to Soil Movements", Proc. National Seminar on Restoration of Structures, September, 1996, pp.73-82
 13. Sundar, V. and Srinivasa Rao, Ch. "Hydrodynamic Characteristics of Accropod and Terapod Mound Breakwaters" Proc. National Conference on Environmental Hydraulics and Free Surface flows, (NCEH & FSF -97) 21-22 Feb'97, Andhra Univ..pp. II-7 to II-12
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 2. Ganesh Babu, K., and G. Siva Nageswara Rao, (1996) "High Volume Fly Ash Concretes for specific Applications" 4th Intl. Seminar on Cement and Building Materials, New Delhi, November, 1996
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11. Sundar, V., Vengatesan, V. and Schlenkhoff, A. "Loads on Inclined Cylinders due to Regular Waves", Proc. to 1st Intl. Conf. on Marine Industry (MARIND'96), Varna, Bulgaria, 2-7 June'96
12. Koola, P.M., Sundar, V., Kaldenhoff, H. and Baur, R. "Pressure Distribution around Cylinders Due to Freak Waves", Proc. Int. Conf. in Ocean Engineering December 17-20, 1996, IIT Madras, India, 189-194.
13. Kalyani Devasena, M.M. All, SP. Subramanian, Sea level variability of the Indian Ocean over two Monsoons - International Conference in Ocean Engineering, ICOE 1996, IIT Madras, India, 17-20 December, 1996
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32. Bhattacharyya, S. Sathyapal and C.P. Vendhan, "Second order wave forces on floating bodies in frequency domain by finite element method", in Conf."Advances of Fluid Mechanics,'96, New Orleans, USA
33. Sudarsan, S.K. Bhattacharyya and C.P. Vendhan, "Stability of towed underwater cable-array system Rajasekharan , Proc.Intl.Conference in Ocean Engineering, 1996, IIT, Madras, PP.141-146
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35. Alagusundaramoorthy, R. Sundaravadivelu and C.Ganapathy, "Experimental study on stiffened panels with cut-outs", International Conference in Ocean Engineering, IIT Madras December 1996, pp.53-58
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54. Sannasiraj, S.A., Sundaravadivelu, R. and Sundar, V. "Behaviour of Long Floating Structures in Oblique Random Waves - An experimental study", Accepted in the Tenth Congress of the Asian and Pacific (APD) of The IAHR, 26-29 Aug'96, Langkawi Island,.
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Distinguished Visitors to the Centre

Sl.No.	Name of the Visitor and Occupation	Date of visit	Purpose of visit (Lecture/ Discussion)
1.	Prof.P. Makhurane Vice Chancellor, National University of Science and Technology, Zimbabwe	7.6.96	Discussion
2.	Prof.C.B.Schedvin, Deputy Vice Chancellor (Academic), University of Melborne, Australia	22.10.96	Discussion
3.	Prof.Chakrabarti, S.K. Chicago Bridge & Iron Co., Plaintiff IL 60544, USA	17-20 December 1996	ICOE'96 Conference

Sl.No.	Name of the Visitor and Occupation	Date of visit	Purpose of visit (Lecture/ Discussion)
4.	Prof.Chaplin, J.R. Dept.of Civil Engg., City University, U.K.	17-20 December 1996	ICOE'96 Conference
5.	Dr.Dharmavasan, S. Technical Software Consultant Ltd., United Kingdom	17-20 December 1996	ICOE'96 Conference
6.	Mr.Frohle, P Research Engineer Universitat Rostock, Germany	17-20 December 1996	ICOE'96 Conference
7.	Mr.Groenveld, R Delft University of Technology, The Netherlands	17-20 December 1996	ICOE'96 Conference
8.	Prof.Gunther F. Clauss Berlin University of Technology, Germany	17-20 December 1996	ICOE'96 Conference
9.	Prof.Hideo Kondo Muroran Institute of Technology. Japan	17-20 December 1996	ICOE'96 Conference
10.	Prof.Isaacson Michael University of British Columbia, Canada V6T1Z4	17-20 December 1996	ICOE'96 Conference
11.	Prof.Kai-Uwe Graw Wirtschaft Swissen Schaftliche Fakult, Universitaet Leipzig, Germany	17-20 December 1996	ICOE'96 Conference
12.	Prof.Mahrenholtz,O Technical University Hamburg, Germany	17-20 December 1996	ICOE'96 Conference
13.	Prof.Neil Bose Ocean Engineering Research Centre Memorial University Newfoundland,Canada-A1B3X5	17-20 December 1996	ICOE'96 Conference
14.	Mr.Priyantga P. Gunaratna Senior Research Engineer Lanka Hydraulic Institute Ltd., Srilanka	17-20 December 1996	ICOE'96 Conference
15.	Mr.Shankar Bhat Vancouver BC, V6T 1Z4 Canada	17-20 December 1996	ICOE'96 Conference
16.	Mr.Siriwardana, K.D.C.F. 415, Bauddhaloka Mawatha Colombo 7, Srilanka	17-20 December 1996	ICOE'96 Conference
17.	Ms.Susanne Knapp Institute for Geotechnics, Waste Management and Hydro-Sciences, University of Wuppertal, Germany	17-20 December 1996	ICOE'96 Conference

Sl.No.	Name of the Visitor and Occupation	Date of visit	Purpose of visit (Lecture/ Discussion)
18.	Dr.Tabeta S, Yokohama National University, Japan	17-20 December 1996	ICOE'96 Conference
19.	Mr.Thambudural, W.S.JK. Ministry of Surface Transport Andaman Lakshadweep Harbour works, Port Blair	17-20 December 1996	ICOE'96 Conference
20.	Dr.Todd W.Grove American Bureau of Shipping Singapore-0511	17-20 December 1996	ICOE'96 Conference
21	Mr.Van de Graff., Delft University of Technology, The Netherlands	17-20 December 1996	ICOE'96 Conference
22.	Dr.Wichers, J.E.W. Maritime Research Institute, The Netherlands	17-20 December 1996	ICOE'96 Conference
23	Koppe, B. University of Rostock, Germany	17-20 December 1996	ICOE'96 Conference
24	Mr.Schlenkoff.A Institute for Geotechnics, Waste Management and Hydro-Sciences, Germany	17-20 December 1996	ICOE'96 Conference
25	Prof.U.R. Rao Space Commission, Chairman, Board of Governors	26.3.1997	
26	Admiral R. Puri Flag Officer, Western Command and Chairman Naval Research Board	27.3.1997	
27	Arne Walther Ambassdor of Norway	27.3.1997	
28	Mr.C.D. Gopinath Chief Executive International Services, Madras	27.3.1997	

4.13 Physics Department

4.13.1 Introduction

Department of Physics was established in the year 1959. Now Ph.D. and M.Sc. Programmes in Physics are offered. In addition, the Department teaches courses in Physics to B.Tech. students. We also have M.Tech. Programmes in Solid State Technology. The Department also undertakes a large number of sponsored and consultancy projects. The highlights are summarized below:

4.13.2 Areas of Teaching and Research

The thrust areas of teaching and research are Condensed Matter Physics, Applied Optics, Photonics, Nonlinear Dynamics, Statistical Physics, Thin Film Physics, Atomic and Molecular Physics. The main research groups are:

1. Low Temperature Physics and Superconductivity
2. Magnetic Resonance and Magnetic Materials
3. Applied Optics
4. Lasers and Photonics
5. Microwave phenomena, Dielectrics and Ferroelectrics
6. Defects in Solids
7. X-Ray Crystallography
8. Atomic and Molecular Physics
9. Statistical Physics and Dynamical Systems
10. Semiconductor Physics and Photovoltaics
11. Solid State Ionics
12. Conducting Polymers
13. Elastic Properties of Solids
14. Thin films

4.13.3 Details of Faculty

Name and Qualification

Area of Specialization

Professors

V. Balakrishnan, Ph.D. (Brandeis Univ. USA)	Theoretical and Statistical Physics
V. Damodara Das, Ph.D. (SPU, Vidyanagar)	Thin Film Materials Science and Technology
P. C. Deshmukh, Ph.D. (Nagpur Univ.)	Theoretical Atomic and Molecular Physics
B. S. V. Gopalam, Ph.D. (IIT Madras)	Semiconductor Physics & Semiconductor Device
M. P. Kothiyal, Ph.D. (IIT Madras)	Applied Optics
(Mrs) Maha Seshasayee, Ph.D. (RPI, New York)	Condensed Matter Physics, Structural Studies in Disordered Systems
J. Majhi, Ph.D. (IIT Madras)	Semiconductor Devices
V. R. K. Murthy, Ph.D. (IIT Madras)	Microwave Physics and Materials

Name and Qualification

T.A.Prasada Rao, Ph.D.(Andhra Univ.)

V.Ramachandran, Ph.D.(IIT Madras)

K.V.S.Rama Rao, Ph.D. (Andhra Univ.)

G.Rangarajan, Ph.D.(IISc, Bangalore)[Head]

R.S.Sirohi, Ph.D.(IIT Delhi)

B.M.Sivaram, Ph.D.(Sussex Univ.UK)

K.Srinivasan, Ph.D.(IIT Madras)

S.Srinivasan, Ph.D.(IIT Madras)

Associate Professors

K.Hariharan, Ph.D.(IIT Madras)

T.S.Natarajan, Ph.D.(IIT Madras)

G.Sreenivasa Murthy, Ph.D.(IIT Madras)

A.Subrahmanyam, Ph.D.(IIT Kharagpur)

B.Subrahmanyam, Ph.D.(Andhra Univ.)

Assistant Professors

(Mrs) S.Lakshmi Bala, Ph.D.(Madras Univ.)

G.Markandeyulu, Ph.D.(IIT Madras)

(Mrs) Neelima M. Gupte, Ph.D.(Suny, USA)

M.S.Ramachandra Rao Ph.D.(IIT Kharagpur)

S.Ramaprabhu, Ph.D.(IIT Madras)

V.Sankaranarayanan, Ph.D.(IIT Madras)

M.V.Satyanarayana, Ph.D.(Madras Univ.)

K.Sethupathi, Ph.D.(Moscow State Univ.)

V.Subramanya Murty, Ph.D.(IIT Madras)

Suresh Govindarajan, Ph.D.(Pennsylvania Univ. USA)

V.Venkateswara Rao, Ph.D.(IIT Madras)

C.Vijayan, Ph.D.(IIT Madras)

T.M.Vimala, Ph.D.(IIT Madras)

Chief Design Engineer

D.K.Sharma, Ph.D.(IIT Madras)

Area of Specialization

Lasers, Spectroscopy and Nonlinear Optics

Condensed Matter Physics & Lattice Dynamics

Magnetism and Magnetic Materials

Low Temperature Physics, Condensed Matter Physics

Optics, Holography, Speckle Phenomenon & Coherent Optics

Laser Physics, Quantum Electronics, Fiber Optics and Photonics.

Electro Optics, Dielectrics

X-ray Crystallography, Educational Technology

Solid State Ionics

Conducting Polymers, Molecular Electronics and Electronic Instrumentation

X-ray Crystallography

Semiconductor Devices, Photovoltaics

Elastic Dielectric and Piezoelectric Properties of Condensed matter

High Energy Physics, Chaos, Field Theory

Magnetism and Magnetic Materials

Nonlinear Dynamics

Ceramics and Intermetallics

Hydrogen in Metals, Nuclear Quadrupole Resonance

Low Temperature Physics, Superconductivity and Cryogenics

Photonics, Quantum Optics

Low Temperature Physics and Superconductivity

Magnetic Resonance

Quantum Field Theory, and String Theory

Applied Optics, Holography and Optical Instrumentation

Photonics and Nonlinear Optics

X-ray Crystallography

Optical Instrumentation, Lens Design

Name and Qualification**Area of Specialization****Senior Scientific Officer Gr.I**

K.Sarangapani, M.Sc.(Madras Univ.)

Thermal Expansion of Materials

CSIR Pool Officer

A.R.Ganesan, Ph.D.(IIT Madras)

Applied Optics, Holography

4.13.4 Students on Roll

Programme	I Year	II Year	III Year	IV Year	V Year	Total
Ph.D	5	3	4	4	31	47
M.Tech. (Solid State Tech.)	8	8				16
M.Sc.	21	20	-	-	-	41
Total	34	31	4	4	31	104

4.13.5 Number of Scholarship/Fellowship holders

Programme	Institute	Others	Total
Ph.D.	15	28	43
M.Sc.	10	5	15
M.Tech	2	-	2
Total	27	33	60

4.13.6 Number of degrees awarded

Degree	Number
Ph.D.	8
M.Sc.	25
M.Tech.(Solid State Technology)	10
M.Tech.(Transducer Physics and Instrumentation)	5
Total	48

4.13.7 Instruments/Equipments Designed and New Methods Developed

1. Development of Optical head for Electronic Speckle Pattern Interferometry
2. Development of Fizeau Interferometer.
3. Novel and simple method for the evaluation of high dielectric constant of ceramics in the microwave frequency region.
4. Facilities for underwater acoustic transducer calibration in the frequency range 10 kHz to 200 kHz.
5. New magnetostrictive transducers (resonating at about 2.5 kHz).
6. Sample holder with He exchange gas facilities for low temperature magnetoresistance measurements.
7. Developed a laser induced fluorescence technique for optical diagnostics of fluid flow in rocket engines.

4.13.8 New Facilities added and Major Equipment Procured

1. K band (18 - 24 GHz) bench - microwave test bench
2. Induction furnace [30 kW] with zoning facility
3. Ball mill with tungsten carbide vessel and balls

4.13.9 Short-term Courses/Workshops/Seminars/Symposia/Conferences organized

S.No	Title of Course	Duration	Co-ordinator(s)
1.	QIP Short term Course on Advanced Semiconductor Materials and Devices	16-20, Dec. 1996	Dr.B.S.V.Gopalam Dr.J.Majhi
2.	XI National Conference on Atomic and Molecular Physics	17-20, Dec. 1996	Dr.P.C.Deshmukh (Convenor)
3.	Technology appreciation programme on "Refrigeration at Cryogenic Temperatures" (Dept. of Mech.Eng.)	21, Feb. 1997	Dr.G.Venkataratnam Dr.V.Sankaranarayanan

4.13.10. Short term courses/Workshops/Seminars/Symposia/Conferences Training attended by the Faculty in recognised Academic Institutions and Public Sectors

S.No.	Name of the Faculty	Title	Period/Duration
1.	Dr.V.Damodara Das	Conference on Thin Film characteristics and applications Bharathiar Univ. Coimbatore	10-12, June 96
2.	Dr.J.Majhi	International Conference on fibre Optics and Photonics IIT, Madras	9-13, Dec. 1996
3.	Dr.V.R.K.Murthy	IX National Conference on ferroelectrics and dielectrics NPL, New Delhi	Oct.8-11, 1996
4.	Dr.V.R.K.Murthy	Recent advances in Ferroelectrics Andhra University Waltair	June 6-7 1996
5.	Dr.B.M.Sivaram	SPIE - BIOS 97 and Opto Electronics Conference, USA	Feb.8-14 1997
6.	Dr.S.Lakshmi Bala	International Conf. on Dynamical Systems, Dept. of Mathematics, IISc Bangalore	Jan.10-15 1997
7.	Dr.N.M.Gupte	TIFR Golden Jubilee Symposium, Mumbai	Sept.2-7 1996
8.	Dr.N.M.Gupte	CSIR Workshop on Chaos & Dynamical System, IISc, Bangalore	June 26-29 1996
9.	Dr.N.M.Gupte	Workshop on Recent Developments in Chaotic Dynamics, Bharathidasan Univ. Trichy	Dec. 9-13 1996
10.	Dr.N.M.Gupte	International Conf. on Dynamical systems IISc, Bangalore	Jan.10-15 1997
11.	Dr.V.Balakrishnan	Kum.L.A.Meera Memorial Meeting on Frontiers in Physics, Mysore, on "Chaos, Complarity and Information"	Feb.1-7 1997
12.	Dr.V.Balakrishnan	International Conf. on Dynamical systems IISc, Bangalore	Jan.10-15 1997

S.No.	Name of the Faculty	Title	Period/Duration
13.	Dr.M.S.Ramachandra Rao	International Conf. on Advances in Superconductivity: New Materials, Critical Currents and Devices ASMCCD' 96 TIFR, Mumbai	Sept.19-20 1996
14.	Dr.M.S.Ramachandra Rao	Indo-French Workshop on 'Recent trends in Magnetism and Magnetic Materials' Udaipur, India	Nov.3-7 1996
15.	Dr.C.Vijayan	DAE Solid State Physics Symposium BARC, Mumbai	Dec. 27-31 1996

4.13.11. Invited Lectures delivered by the Faculty in Academic Institutions/Public Bodies

S.No.	Name of Faculty	Topic of the Lecture	Delivered at	Date
1.	Dr.V.Damodara Das	Techniques of structural characterization of Thin Films	Conference on Thin Film characterization and Applications Bharathiar Univ. Coimbatore	June 10, 1996
2.	Dr.P.C.Deshmukh	Synchrotron Radiation Spectroscopy of Atoms and molecules	B.A.R.C. Mumbai, INDO-Japanese Collaboration Meeting	July 1, 1996
3.	Dr.B.S.V.Gopalam	Transport properties Optical properties Ellipsometry Semiconductivity	G.N.D. Univ. Amritsar	March 24-30 1997
4.	Dr.M.Seshasayee	Amorphous Systems	Mahatma Gandhi Univ. Kottayam Kerala	June 30, 1996
5.	Dr.K.V.S.Rama Rao	Novel magnetic materials-Rare Earth Transition metal Nitrides	State Univ. of New York at Albany, USA	Sept. 10, 1996
6.	Dr.K.V.S.Rama Rao	Magnetic properties of $[Er_{0.5}Pr_{0.5}]_2Fe_{17-x}Al_xN_y$ compounds	Naval Research Lab. Washington, USA	Sept. 13, 1996.
7.	Dr.K.V.S.Rama Rao	Effect of Al on the magnetic properties of $[Er_{0.5}Pr_{0.5}]_2Fe_{17}$	Dept. of Physics Morgan State Univ. USA	Sept. 16, 1996
8.	Dr.K.V.S.Rama Rao	Magnetism in Rare Earth Transition metal Nitrides	Michigan State Univ. USA	Sept.20, 1996.
9.	Dr.K.V.S.Rama Rao	Magnetic properties of $[Er_r]_2[Fe,Al]_{17}$	AMES Lab. Iowa State Univ.	Sept.24, 1996
10.	Dr.K.V.S.Rama Rao	Spin Reorientation phenomena as seen by Resonance Techniques	Dept. of Physics I.I.Sc. Bangalore	Nov.25, 1996

S.No.	Name of Faculty	Topic of the Lecture	Delivered at	Date
11.	Dr.K.V.S.Rama Rao	Recent work on Nitro-magnets	School of Physics Central Univ. Hyderabad	Jan.25, 1997
12.	Dr.G.Rangarajan	Thermometry at cryogenic temperatures	TAP program on Refrigeration at Cryogenic Temperatures IC & SR, IIT, Madras	Feb.21, 1997
13.	Dr.V.Sankaranarayanan	Refrigeration below 1K	TAP program on Refrigeration at Cryogenic Temperatures IC & SR IIT, Madras	Feb.21 1997
14.	Dr.K.Sethupathi	Superconductivity and Applications	TAP Program on Refrigeration at Cryogenic Temperatures IC & SR IIT, Madras	Feb.21, 1997
15.	Dr.S.Srinivasan	Applications of X-ray diffraction An overview	Centenary of the discovery of X-rays, Madras Univ., Chennai	Mar.30, 1996
16.	Dr.S.Lakshmi Bala	Dynamical chaos-an introduction	Jamia Millia Islamia Univ. New Delhi	March 20- 22 1997
17.	Dr.S.Lakshmi Bala	Chaos in gauge theories	-do-	-do-
18.	Dr.N.M.Gupte	Mixing and Coherence in chaotic flows	S.N.Bose Centre for Basic Sciences Calcutta IISc, Bangalore, Bharathidasan, Trichy	Dec.27, 1996
19.	Dr.M.S.Ramachandra Rao	Recent Trends in Magnetism and Magnetic Materials	Indo French Workshop Udaipur, India	Nov.3-7, 1996
20.	Dr.M.S.Ramachandra Rao	Advanced Semiconductor materials & devices	QIP-short term IP-short term course, IIT, Madras	16-20 Dec. 1996
21.	Dr.V.Ramachandran	Phonons in materials	Physics Dept. Anna Univ. Madras	22.2.97

4.13.12. Visits Abroad

S.No.	Name of Faculty	Country Visited	Date	Purpose of Visit
1.	Dr.R.S.Sirohi	Germany	August 1996	Humboldt Award (for 1 year)
2.	Dr.N.Krishna Mohan	USA	August 1996	SPIE conference

S.No.	Name of Faculty	Country Visited	Date	Purpose of Visit
3.	Dr.M.Seshasayee	Italy	July 22- Aug.2, 1996	To attend the Workshop on Protein-Membrane interactions
4.	Dr.K.V.S.Rama Rao	Japan	Aug.24-30 1996	To have discussions with Prof.M.Matsumoto Shinshu Univ. as well as to be present at the signing ceremony of the MOU between IIT, Madras and Shinshu Univ.
5.	Dr.K.V.S.Rama Rao	Brazil	Aug.31-Sept.8, 1996	To present papers at the the 14th International workshop on Rare Earth magnets and their applications, Sao Paulo, Brazil
6.	Dr.K.V.S.Rama Rao	U.S.A.	Sept.08-Sept.29 1996	To have discussions with the counterparts of the INDO-US project and also visit laboratories working in the area of Magnetism and Magnetic Materials.
7.	Dr.K.V.S.Rama Rao	U.S.A	Nov.05-09, 1996	To present papers at the International conference on Giant Magnetostrictive Materials, Honolulu, Hawaii, USA.
8.	Dr.K.V.S.Rama Rao	U.S.A	Mar.15-29, 1997	To attend the American Physical Society Meeting and to have discussions with the US counterparts on the on going Indo-US project.
9.	Dr.G.Rangarajan	Germany	Jan-Feb 1997	DAAD short term visit programme
10.	Dr.B.M.Sivaram	U.S.A.	Feb.8-14, 1997	To participate in a conference SPIE BIOS 97 and Opto electronics 97
11.	Dr.T.S.Natarajan	Thailand	16-21 Dec.1996	To present a paper on Physics Education In 21st Century

4.13.13. Distinguished Visitors to the Department (Important Dignitaries above the level of Professors)

S.No.	Name of the Visitor	Date of Visit	Purpose of Visit(Lecturees/Discussion)
1.	Dr.S.Venkatraman Department of Elec. & Comp. Science, Pittsburg,USA.	8.6.96	Lecture
2.	Prof.Fujishima Univ. of Tokyo, Japan.	2.8.96	Lecture
3.	Dr.Alonso Vante Germany	7.8.96	Lecture
4.	Prof.T.Venkatesan Univ. of Maryland, USA	26.9.96	Lecture
5.	Dr.R.Krishnan CNRSV Versaille, France	7.11.96	For discussion
6.	Prof.N.Rezesu Inst. of Tech. Physics Romania	21.11.1996	Lecture
7.	Prof.Lingamurthy Univ. North Carolina USA	28.11.96	lecture
8.	Prof.F.Studer CRISMAT, France	7.12.96	Lecture
9.	Dr.Jurgen Hauck IEE-KFA Research Centre Germany	8.12.96	Lecture
10.	Dr.Karel Knizek Czech Republic	12.12.96	Lecture
11.	Prof.S.T.Manson Atlanta, USA	10-21, Dec. 96	Project discussion & Lecture
12.	Prof.Dennis Lindle Las Vegas, USA	16-22 Dec.96	-do-
13.	Prof.G.R.Quisbel Latrobe Univ.Melbourne, Australla	18.12.96	Lecture
14.	Dr.A.V.R.Warrier SSPL,New Delhi	30.12.96	Lecture and Project discussion
15.	Prof.Klipping & Ms.Klipping, Berlin Germany	27-29 Jan. 1997	Project discussion
16.	Prof.F.J.Berry Head, The Open University U.K.	4.2.97	Lecture
17.	Dr.Julin Christian CNRS Lab, France	12.2.97	Lecture
18.	Prof.Matthias Brack Univ. Regensburg, Germany	20.2.97	Lecture

S.No.	Name of the Visitor	Date of Visit	Purpose of Visit(Lectures/Discussion)
19.	Prof.Jeltschko Director, Univ. of Munster, Germany	6.3.97	Lecture
20.	Prof.R.Srinivasan Raman Research Institute Bangalore	19.3.97	Lecture
21.	Prof.Govind Swarup NCRA, Pune	15.4.97	Lecture

4.13.14. Sponsored Projects

S.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Co-ordinator(s)
1.	Optical Instrumentation	upto 30.12.97	DAE (NLP)	50.00	Dr.R.S.Sirohi Dr.M.P.Kothiyal Dr.D.K.Sharma Dr.V.V.Rao
2.	Studies on Photorefractive Materials for Real Time Holography	3 Years	DST	10.37	Dr.R.S.Sirohi Dr.N.Krishna Mohan
3.	Single Interferogram analysis and wavefront fitting	2-1/2 years	ISRO	4.50	Dr.D.K.Sharma Dr.V.V.Rao
4.	Structure studies on Li2S-SiO2 glasses Using neutron diffraction	Mar.1995-1998	IUC DAEF	0.63 per year	Dr.Maha Seshasayee
5.	Molecular Dynamic simulation of superionic glasses RMC approach	Feb-1997-2000	DST	4.00	Dr.Maha Seshasayee Dr.A.Subrahmanyam
6.	Development and Characterisation of Copper clad PTFE/woven cloth substrates for Microwave applications	95-97	DRDO	11.90	Dr.V.R.K.Murthy Dr.B.Viswanathan
7.	Dielectric and Ultrasonic studies on Polar liquids and liquid mixtures for microwave applications	95-98	CSIR	3.30	Dr.V.R.K.Murthy Dr.B.Subramanyam

S.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Co-ordinator(s)
8.	Study of Hydrogen absorption and kinetics in novel Zr based alloys	97-99	INDO-GERMAN (IITM & BMFT)	1.95	Dr.P.C.Schmidt, Darmstadt, Germany and Dr.K.V.S.Rama Rao
9.	Magneto-Transport studies on Semiconductor like Mercury Cadmium Tellurids	96-98	DRDO	9.10	Dr.V.Sankaranarayana n Dr.K.Sethupathi
10.	Spatio-temporal order and chaos in systems with many degrees of freedom	3 years	DST	22.00	Dr.Neelima Gupte Dr.S.Lakshmi Bala Dr.Suresh Govindarajan
11.	Preparation of high quality Bi-Sr-Ca-Cu-O superconductor by melt texturing for applications	2 years	DST	3.00	Dr.M.S.Ramachandra Rao
12.	Specific heat studies of Magnetic Ordering Phenomena down to Millikelvin Temperatures	1997-2000	DST	11.47	Dr.G.Rangarajan Dr.V.Sankaranarayana n
13.	Development of magnetostrictive materials	1994-98	TDM	160.00	Dr.K.V.S.Rama Rao
14.	Development of high energy density magnetic materials	1994-98	TDM	54.70	Dr.K.V.S.Rama Rao
15.	Fundamental Investigations on hydrogenated mixed alloys of rare earth and transition metals	1991-97	Indo-US	13.90	Dr.K.V.S.Rama Rao Dr.K.V.Reddy Dr.T.P.Das (State Univ. of New York, USA)
16.	Determination magnetic structure of $(Pr,Er)_2Fe_{17-x}Al_xNy$ compounds using neutron diffraction	1995-98	IUC-DAEF	0.58	Dr.G.Markandeyulu Dr.K.V.S.Rama Rao
17.	Development of a temperature sensitive magnetic switch	1997-99	ICCAR	24.73	Dr.G.Markandeyulu Dr.K.V.S.Rama Rao Dr.A.K.Kolar (Mech.Engg) Dr.K.Prasada Rao (Metall.Engg)

S.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Co-ordinator(s)
18.	Ionizations of atoms by Electromagnetic Radiation	1994-97	NSF USA	7.10	Dr.P.C.Deshmukh Dr.S.T.Manson (Georgia State Univ.)

4.13.15. Major Consultancy Assignments

S.No.	Title	Organisation	Amount (In Lakhs)	Co-ordinator(s)
1.	Development of Optical head for ESPI System	ISRO, Bangalore	1.65	Dr.R.S.Sirohi Dr.M.P.Kothiyal Dr.D.K.Sharma Dr.V.V.Rao Dr.N.Krishna Mohan
2.	Development of Fizeau Interferometer	Prism India Ltd. Pondichery	0.60	Dr.R.S.Sirohi Dr.M.P.Kothiyal Dr.D.K.Sharma Dr.V.V.Rao Dr.N.Krishna Mohan
3.	Determination of leak rate of metallic bellows	Metallic Bellows Pvt.Ltd. Madras	0.17	Dr.G.Rangarajan
4.	Supply of liquid Helium to maintain superconducting MRI System	Vita Diagnostics, Madras	0.10	Dr.G.Rangarajan
5.	Consultancy work on Cryogenic vessels	Fluidyne Engineers	0.15	Dr.G.Rangarajan
6.	Callbration of Industrial Platinum Resistance Thermometer	BS & B safety system	0.05	Dr.V.Sankaranarayanan

4.13.16. Honours and Awards

S.No.	Name of the Faculty/Student	Honours/Awards
1.	Dr.R.S.Sirohi	Galileo Galilei Award for the year 1995 presented by the International Commission for Optics (ICO)
2.	Ganesh Udupa, R.S.Sirohi, M.Singaperumal and M.P.Kothiyal	Best paper award at the 17th AIMTDR Conf. REC, Warangal, Jan. 1997
3.	J.S.Darlin, M.P.Kothiyal R.S.Sirohi	Prize for poster paper presentation at LAMI-97 Conference, IGCAR, Kalpakkam, Feb. 1997

4.13.17. Research Publications

1. Techniques of Structural Characterisation of Thin Films V.Damodara Das (Invited) Thin Film Characterization and Applications, p.31-44 Allied Publishers, Ltd., New Delhi (1996).
2. Temperature Effects on the Operation of n-CdSe_{0.6}Te_{0.4} Thin Film Polysulphide Photoelectrochemical Solar Cells
3. V.Damodara Das and Laxmikant Damodare Thin Film Characterization and Applications, p.121-124 Allied Publishers, Ltd., New Delhi (1996).
4. Structural and Optical Studies on Thermally Oxidised Vacuum Deposited Tin Thin Films V.Damodara Das, N.Siva Kumar and S.Selvaraj Thin Film Characterization and Applications, p.343-346 Allied Publishers, Ltd., New Delhi (1996).
5. Anomalous Temperature Dependence of Electrical Resistivity in Pb_{0.8}Sn_{0.2}Te Thin Films : V.Damodara Das and C.Bahulayan Thin Solid Films, 274, No.4-5, p.55-62, (1996).
6. Electron Microscopic Studies and Microchemical Analysis of Se₁₀Sb₁₀Te₈₀ Ternary Alloy Thin Films: V.Damodara Das and K.S.Raju Japan Journal of Applied Physics, 35, part I, No.4A, p.2234-2239, (1996).
7. A Study of Band-bending and Barrier Height Variation in Thin Film n-CdSe_{0.5}Te_{0.5} Photoanode/Polysulphide Junction V.Damodara Das and Laxmikant Damodare Solid State Communications, 99, No.10, p.723-728, (1996).
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45. Composite ion conductors: conduction characteristics of some Typical Interfaces K.Hariharan Proc. of the Second National Conference on Solid State Ionics Madras (1996).
46. Hydrogen absorption characteristics in C15 cubic Zr based alloys Y.V.G.S.Murthy, K.V.Reddy, S.Ramaprabhu, T.R.Kesavan and K.V.S.Rama Rao Presented at the INDO-US Conference held at Delhi, India (1997).

47. Hydrogen absorption characteristics in C15 cubic Zr based alloys Y.V.G.S.Murty, K.V.Reddy, S.Ramaprabhu, R.Ramesh, T.R.Kesavan and K.V.S.Rama Rao Presented at the INDO-US Conference held at Goa, India (1997).
48. Hydrogen storage and utilization S.Ramaprabhu and K.V.S.Rama Rao Lecture notes for University Curriculum on renewable energy system for Waterfalls Institute of Transfer Technology, India (1996).
49. Magneto-conductivity of NdBa₂Cu₃O_{7-x} thin film in the paraconductivity and paracoherence regimes Narayani Senthilkumaran, S.Ravi, K.Sethupathi, V.Sankaranarayanan and G.Rangarajan Proceedings of the International Symposium on Advances in superconductivity: TIFR, Mumbai (1996).
50. Magnetoresistance measurements on single element photoconductive Hg_{1-x}Cd_xTe detectors D.Srinivasan, K.Sethupathi, V.Sankaranarayanan, G.Rangarajan, R.Ashokan, B.L.Sharma H.S.Dewan and V.Gopal Proceedings of the 3rd International Conference and Intensive Tutorial course on Semiconductor Materials and Technology, New Delhi (1996).
51. Optical Nonlinearities due to Color Centers M.H.Majles Ara, C.Vijayan and Y.V.G.S.Murti National Laser Program Workshop on Nonlinear Optics, C.A.T., Indore, (1996).
52. Second Harmonic Generation and Parametric Mixing due to FA Centers in KC1:Na Crystals M.H.Majles Ara, C.Vijayan and Y.V.G.S.Murti International Conference on Fibre Optics and Photonics PHOTONICS-96, Madras, (1996).
53. Studies on semiconductor Quantum Dots of CdS in a Polymer Matrix P.Nandakumar, C.Vijayan, Y.V.G.S.Murti, K.Dhanalakshmi and G.Sundararajan International Conference on Fibre Optics and Photonics PHOTONICS-96, Madras, (1996).
54. Optical properties of PbS Quantum Dots in Nafion P.Nandakumar, C.Vijayan, Y.V.G.S.Murti, K.Dhanalakshmi and G.Sundararajan National Symposium on Laser Applications in Materials Science and Industry (LAMI-97), IGCAR Kalpakkam, (1997).
55. New Crystalline Media for Optical Parametric Mixing Y.V.G.S.Murti, C.Vijayan and M.H.Majles Ara National OSI Symposium Calcutta, (1997).
56. Photoacoustic Spectral Studies on CdS Semiconductor Quantum Dots in Nafion Matrix P.Nandakumar, A.R.Dhobale, Y.Babu, M.D.Sastry, C.Vijayan, Y.V.G.S.Murti, K.Dhanalakshmi and G.Sundararajan Proc. of the DAE Solid State Physics Symposium, BARC Bombay, (1996).
57. Dependence of critical current (I_c) on weak lines in metal/metal oxide added Bi-2212, K.S.Ramesh, P.Sumana Prabhu and M.S.Ramachandra Rao Proc.Intl.Symp.Adv. Supercon, New Materials, Critical Currents and Devices, ASMCCD'96, TIFR, Mumbai, (1996).
58. A study of YbBa_{2-x}Sr_xCu₃O₇ thin films S.Srinivas, M.S.Ramachandra Rao, A.K.Bhatnagar and R.Pinto Intl.Symp.Adv. Supercond. New Materials, Critical Currents and Devices, ASMCCD 96, TIFR, Mumbai (1996).
59. Phase formation and superconducting in ReBaSrCu_{3-x}(PO₄)_yO_y (0 < x < 0.3) K.N.Marimuthu, M.S.Ramachandra Rao and U.V.Varadaraju Intl.Symp.Adv. Supercond. New Materials, Critical Currents and Devices, ASMCCD 96, TIFR, Mumbai (1996).
60. Electrical resistivity studies on laser ablated YBCO films upon high energy irradiation. Manmeet Kaur, V.Ganesan, R.Srinivasan, D.Kanjilal, G.K.Mehta, S.P.Pai, M.S.Ramachandra Rao and R.Pinto. Intl.Symp.Adv. Supercond. New Materials, Critical Currents and Devices, ASMCCD 96, TIFR, Mumbai (1996).
61. Improved performance and stability of Au-doped YBa₂Cu₃O₇ thin films for microwave devices. M.S.R.Rao, P.R.Apte, S.P.Pai, K.I.Gnanasekar and R.Pinto, Journal, Proc. of the SPIE 2559, 30, (1996).

62. Measurement of high voltage pulses based on Kerr effect K.Rajagopal and T.A.Prasada Rao **Proc. of the ICDL-96, Rome, Italy, July 15-19, (1996).**
63. Determination of anisotropic polarisabilities of some organic molecules in liquid states by Kerr studies K.Rajagopal and T.A.Prasada Rao **Proc. of the ICDL-96, Rome, Italy, July 15-19, (1996).**
64. Glass fibre lasers and amplifiers based on rare earth dopants B.M.Sivaram **Proc. of the Int.Conf. on Photonics and Fibre Optics P.1221-1227, (1996).**
65. Noise characteristics of erbium doped fibre amplifiers with signal upconversion and pump excited state absorption losses Prita Nair, B.M.Sivaram and J.P.Raina **Rare Earth Doped Devices** edited by Seppo Honkanen, SPIE 2996, (1997).
66. Temperature dependence of dual amplified spontaneous emission from DAMC laser dye, L.Vetrivel and B.M.Sivaram **Proc.Int.Conf. on Spectroscopy - Perspectives and Frontiers, 167 (1996).**
67. Dual amplified spontaneous emission from 7 diethyl amino 4 methyl coumarin (DAMC) laser dye under picosecond pumping L.Vetrivel and B.M.Sivaram **Fluorescence Detection IV** edited by E.R.Manuel, SPIE, 2705, 31-35, (1996).
68. Effect of pump pulse duration on the laser action from diethyl amino methyl coumarin (DAMC) laser dye L.Vetrivel and B.M.Sivaram **XX International Quantum Electronics Conference, Sydney, July 14-19, (1996).**
69. Use of gain spectroscopy to obtain sole and exclusive evidence for excited state solute-solvent complexes L.Vetrivel and B.M.Sivaram **Advances in Fluorescence Sensing Technology III**, edited by J.R.Lakowicz and R.B.Thompson, SPIE 2980, (1997).

4.13.19 Any other relevant details

- * Prof.V.R.K.Murthy has been selected as a member - V plan on 'Planning of Materials' of DOE, New Delhi.
- * Prof.S.Srinivasan has worked as an expert member for the University Grants Commission in the visiting committee for assessing the IX plan requirements of South Gujarat University, Surat and University of Mumbai, Mumbai, Feb 21-28, 1997.
- * Prof.B.M.Sivaram served as Co-chair Technical Committee for the International Conference on Photonics and Fibre Optics held during December 1996 at IIT, Madras.
- * Dr.K.Hariharan is a guest editor of the special issue of Bulletin of Electrochemistry, Vol.12, 1996.
- * A new laboratory core course for the II M.Sc students titled "Advanced Physics Laboratory - PH 705" was started and about 20 advanced level experiments were set up.

The following Faculty and Staff members retired from service:

1. Prof.Y.V.G.S.Murthy
2. Prof.K.V.Reddy
3. Prof.S.Srinivasan
4. Sri.P.N.Sethuraman
5. Sri.L.Srinivasan

4.14 Regional Sophisticated Instrumentation Centre

4.14.1 Introduction

The Regional Sophisticated Instrumentation Centre was established in 1974-75. Now Ph.D programmes are being offered.

The major areas of teaching and research of the Departments are:

- * Molecular Spectroscopy
- * Quantum Chemistry
- * Instrumentation
- * Magnetic Resonance Spectroscopy
- * Study of Biomolecules, in Clusters in solids/solutions
- * Electron Spectroscopy and Mass Spectrometry

4.14.2 Details of Faculty:

Name and Qualification

Major area of Specialisation

CSIR Emeritus Scientist

Dr. P T Manoharan, Ph.D.(Columbia)

Theoretical Chemistry and Magnetic Resonance Spectroscopy of Transition Ions & Bioinorganic Chemistry

Professors

Dr. Surjit Singh, Ph.D.(IIT Kanpur)

Molecular Spectroscopy and General Physical Chemistry

Dr. S Subramanian, Ph.D.(Leicester)

Magnetic Resonance Spectroscopy & Theoretical Chemistry

Assistant Professor

Dr. T Pradeep, Ph.D.(IISc. Bangalore)

Molecular Films, Molecular Spectroscopy, Electron Spectroscopy & Tandem Mass Spectrometry

4.14.3 Students on Roll (as on January 1996);

Programme	I Year	II Year	III Year	IV Year	V Year	Total
Ph.D	1	2	2	-	10	15
No. of Research Associates	Projects: 1	CSIR : 2			Total : 3	

4.14.4 Number of Scholarships/Fellowships holders

Programme	Institute	CSIR	Others	Total
Ph.D	3	4	8	15

4.14.5 Number of Degrees Awarded

Programme	Number
Ph.D	6

4.14.6 Instruments/Equipment Designed and Developed

FT-EPR Spectrometer being developed

Data Acquisition system for EPR

Cold-room fully developed/usable.

A tandem mass spectrometer being developed

4.14.7 New Facilities added and Major Equipment procured

All the RSIC Computers have been put on internet

A quadropole Mass spectrometer being installed.

Additional facilities are being added to ESCA.

4.14.8 Invited Lectures delivered by the Faculty in Academic Institutes/Public Bodies

S.No.	Name of Faculty	Topic of the lecture	Delivered at	Date
1.	Dr. P T Manoharan		a. Mahatma Gandhi University Kottayam	April 1996
			b. University of Pune Pune	May 1996
			c. University of Pondicherry Pondicherry	May 1996
			d. University of Florence Florence	June 1996
			e. University of Fribourg Switzerland	June 1996
			f. University of Neuchatrel Switzerland	June 1996

S.No.	Name of Faculty	Topic of the lecture	Delivered at	Date
	Dr. P T Manoharan		g. Saha Institute of Nuclear Physics, Sadhan Basu Lecture Calcutta	Oct. 1996
			h. Tata Institute of Fundamental Research, Bombay	Nov. 1996
2.	Dr. S Subramanian	a. Magnetic Resonance Spectroscopy	Sri Venkateswara Univ. Tirupathi, A.P.	Oct. 1996
		Transition Metal EPR	b. University of Pune, Pune	Sept. 1996
			c. Indian National Academy, New Delhi	March 1997
3.	Dr. T Pradeep	a. Reactions of Ions at Molecular surfaces	7th NSMS, Gwallar	28 Nov. 1996
		b. Electron Spectroscopy	M.G. University Kottayam	April 1996

4.14.9 Visits abroad

S.No.	Name of Faculty	Country Visited	Date	Purpose of visit
1.	Dr. P T Manoharan	Switzerland	June 1996	Invited Lecture
2.	Dr. S Subramanian	USA National Institute of Health, Bethesda, MD	May/June 1996.	Invited Lecture

4.14.10 Distinguished visitors to the Department (Important Dignitries above the level of Professor)

S.No.	Name of the visitor & Occupation	Date of Visit	Purpose of visit (Lecture/Discussion)
1.	Dr. Jayashree Srinivasan Scripps Research Institute Lajolla California, USA.	07.11.96	Lecture
2.	Dr. William Shirley Scripps Research Institute Lajolla California, USA	07-11-96	Lecture
3.	Prof. G.Krishnamoorthy Tata Institute Of Fundamental Research Bombay	13-11-96	Lecture
4.	Dr. W. Kaim Professor Institut For Anorganische	27-12-96	Lecture

S.No.	Name of the visitor & Occupation	Date of Visit	Purpose of visit (Lecture/Discussion)
	Chemie, Universitat Stuttgart, Germany		
5.	Dr. Lalitha Subramanian Molecular Simulations Inc. San Diego, California USA	13-01-1997	Lecture
6.	Dr. K.V.R. Chary Chemical Physics Group Tata Institute Of Fundamental Research Bombay	10-02-1997	Lecture
7.	Dr. Nirmala R Mount Senai School Of Medicine, New York, USA	31-03-1997	Lecture

4.14.11 Sponsored Projects

S.No.	Title	Period	Funding Agency	Amount (Rs. in Lakhs)	Co-ordinator(s)
1.	Spectroscopic Investigations of Inter and Intra molecular Interactions	1991-95	DST	18.00	Dr. P T Manoharan
2.	Construction of FT-EPR Spectrometer	1992- 1995	DST	84.00	Dr. P T Manoharan Dr. S Subramanian
3.	M.O. Station for Solvation Studies	-	AvH Germany - Donated Work Station	6.00	Dr. Surjit Singh
4.	US-India Rupee Project	-	-	20.00	Dr. P T Manoharan Dr. S Subramanian
5.	Chemistry of Metallo-carbohedrenes	1995-98	DST	9.05	Dr. P T Manoharan Dr. T. Pradeep
6.	Chemistry of functionalised and	1995-97	DST	3.47	Dr. T Pradeep
7.	Chemical writing on organised molecular assemblies	1995-97	JNC	2.00	Dr. T Pradeep
8.	Spectroscopic Investigation of transition ions	1995- 2000	CSIR	8.00	Dr. P.T. Manoharan
9.	Tandem mass Spectrometry and ion/surface collisions	1997- 2000	DST	48.60	Dr. T. Pradeep

4.14.12 Research Publications

Dr. P T Manoharan

1. Diagrammatic Valence Bond Studies on Hemocyanin, P.K. Mandal, P.T. Manoharan, B. Sinha and S. Ramasesha, *Theoret.Chim.*93,1 (1996) [16 pages].
2. Fitting of Magnetic Susceptibility Data as a Function of Temperature of Various Spin System -- A Fortran Program, G.V.R. Chandramouli, C. Balagopalakrishna, M.V. Rajasekaran and P.T. Manoharan, *Computers and Chemistry*, 20,353-358(1996)[6 pages].
3. Calculation of exchange coupling in exchange coupled dimers, S. Lalitha, R. Bhavani, G.V.R. Chandramouli and P.T. Manoharan, *Theo.Chem.*361, 161-173, (1996) [13 pages].
4. Structure characterisation of Cu(I) complexes of 2,6-Bis(3,5-dimethyl-1-pyrazolyl methyl Pyridine), P. Manikandan, Babu Varghese and P.T. Manoharan, *J.Chem.Soc.(Dalton)*371-376, 1996[6 pages].
5. Electronic Structure of Thalaporphyrin-an XPS Study, C.S.Gopinath, R.P. Pandian and P.T. Manoharan, *J.Chem. Soc., (Dalton)*1255-1259[5 pages].
6. The Production of Superoxide from hemoglobin Bound Oxygen under hypoxic condition, Ch. Balagopalakrishna P.T. Manoharan, Omoeffe Abugo and J. Rifkind, *Biochemistry*, 35,6393-6398 (1996) [6 pages].
7. Surface Active Peptide Mediated Porphyrin Aggregation, B. Venkatesh, R. Jayakumar, R.P. Pandian and P.T. Manoharan, *Biochem.Biophys.Res. Commun.*223,390-396(1996)[7 pages].
8. A nonperical approach to the ground-state Jahn-Teller distortion: Case Study of VeI_4 , R. Bruydonckx, C. Daul, P.T. Manoharan, *Inorg.Chem.*(1997)
9. Inorganic Molecular Ferromagnets -- Advances in Physical Chemistry, P.T. Manoharan, -- to appear as part of a book.
10. Hybrid Hemoglobins, B. Venkatesh, J.M. Rifkind and P.T. Manoharan, *Progress In Inorg.Chem.*(Ed.K.D. Karlin) 1997.
11. Dynamic and Static Jahn-Teller Distortions in a Macrocyclic Nitrogen Cage Complex of Ag(II), T.K. Kundu and P.T. Manoharan, *Chem. Phys. Lett.*264(1997) 334-338 [5 pages].

Dr. Surjit Singh

1. Ab initio molecular orbital calculations on Ion-molecule Complexes of formamide with LiF and LiCl, Mohandas and Surjit Singh, *Theochem*, 361(1996) 229-242.
2. Ab Initio Study of Trimethyl Phosphate: Conformational Analysis, Dipole moments, Vibrational Frequencies and Barriers for Conformer Interconversion, Lisa George, K.S. Viswanathan and Surjit Singh, *The Journal of Physical Chemistry*.
3. Infrared Spectral Studies on Preferential Solvation of Lithium ions in binary mixtures of acetonitrile and dimethyl formamide, V.A. Sajeekumar and Surjit Singh, *Journal of Molecular Structure* 382(1996) 101-110.

Dr. S Subramanian

1. Electronic Structure of two heterotrinary metal complexes $[Ru_2Co(u_3O)(u-CH_3CO_2)_6L_3]$, (L = H₂O, Py), M. Velayutham, C.S. Gopinath and S. Subramanian, *Chem. Phys. Lett.*249, 71(1996).

2. Three dimensional structure of some synthetic calmodulin fragments using high resolution NMR, CD, IR and molecular modelling, L. Gomathi, T. Fairwell, G.A. Krishna, J.A. Ferretti and S. Subramanian, *Curr.Sci.*70, 910(1996).
3. Elucidation of secondary structures of peptides using high resolution NMR, L. Gomathi and S. Subramanian, *Curr. Sc.*71, 533 (1996).
4. The Solution structure of TRH - A 11H NMR Reinvestigation - T. Kanthimathi, L. Hughes, S. Subramanian, *Magn.Reson. Chem*, 34,83 (1996).

Dr. T. Pradeep

1. Low energy collisions of methane ions in fluoroalkyl monolayer surfaces, T. Ast, T. Pradeep, B. Feng and R.G. Cooks, *J. Mass Spectrom*, 31(1996)791.
2. Chemical transformations of self assembled monolayers by reactive ion beam bombardment, B. Varghese, A.Dorothy and T. Pradeep, *Int.J. Mass Spectrom. Ion Processes*, 155 (1996) 69.
3. Investigation of depth of referential ordering in liquids: a photoelectron spectroscopic investigation of liquid mixtures, V.Bindu and T. Pradeep, *J.Chem.Phys.* 106(1997)1231.
4. A glimpse into the fascinating world of fullerenes, T.Pradeep, *Current Science*, 72 (1997) 124.
5. Infrared Spectroscopic study of the structural transitions of $C_{60}Br_{24}$, M.R. Resmi, L. George, Surjit Singh, T. Pradeep and K. Uday Sankar, *J.Mol.Struct.*
6. Thermal decomposition of $C_{60}Br_{24}$ and $C_{60}Br_8$: absence of sequential elimination, M.R. Resmi, K. Smitha and T.Pradeep, *Proc. Indian Acad. Sci. (Chem. Sc.)*.
7. Fascinating world of fullerenes, T.Pradeep, M.R. Resmi in "Frontiers in Physical Chemistry", T. Pradeep, Ed. Allied Publishers, New Delhi (1997).
8. Self Assembled monolayers, V. Bindu and T. Pradeep, in "Frontiers in Physical Chemistry", Ed., Allied Publishers, New Delhi (1997).
9. Reactions of ions at molecular surfaces, T. Pradeep, in "Frontiers in Physical Chemistry", Ed., Allied Publishers, New Delhi (1997).

4.14.14 Any other Relevant details

- | | | |
|----|---------------------|--|
| 1. | Prof. P T Manoharan | <ol style="list-style-type: none"> a. Chairman, UGC Panel in Chemistry b. Member, PAC/DST (Inorganic Chemistry) c. Member, RAC, I.A.C.S., Calcutta d. Member, INSA-COSTED National Committee |
| | Prof. P T Manoharan | <ol style="list-style-type: none"> e. Member, RAC and Executive Council, IUC, Indore f. Vice President, National Magnetic Resonance Society g. Received the 'Morris Travers Lecture Award' from the Indian Institute of Science, (1995) h. Received the 'K S G Das Memorial Lecture Award' (1995) i. Sadan Basu Memorial Award (1996) |

2. Prof. Surjit Singh
- j. Secretary, Indian national Science Academy(1997-)
 - a. Member, Editorial Board, Indian Journal of Chemistry
 - b. Name included in 'World Who's Who' as distinguished Educator
3. Prof. S Subramanian
- a. Member, PAC/DST [Physical Chemistry]
 - b. Member, CSIR Chemistry/Chemical Sciences Extramural Advisory Committee
 - c. Member, Sectional Advisory Committee Indian Association for Cultivation of Science Calcutta.
 - d. Member, Sectional Committee/Chemical Sciences Indian Academy of Sciences
 - e. Member, Sectional Committee/Chemical Sciences Indian National Science Academy
4. Dr. T. Pradeep
- a. Young Associate, IUPAC.

4.15 Fibre Reinforced Plastics Research Centre

1. Introduction

Fibre Reinforced Plastics (FRP) Research Centre was established in 1974 with a view to take up interdisciplinary research, manpower development and industry oriented programmes in the area of composites and their technological applications. Over the years, the Centre has built up one of the best facilities in the country for research on Fibre Reinforced Plastics. Work has also been taken up on ceramic and metal matrix composites (CMC and MMC). It is proposed that the activities of the Centre can be expanded with the support of the industries and through sponsored research projects. To focus attention on the expanded activities, the name of the Centre has been changed with the approval of the Board of Governors to Composites Technology Centre (COMPTEC). This new name will come into effect from the financial year 1997-98.

The Centre has been offering elective courses for students registered through various departments for B.Tech. M.Tech, MS and PhD. The students are also taken by the Centre for MS and PhD programmes. An M.Tech. specialisation in composites technology has been approved by the Senate which will be taken up from July 1997 semester. A total of 9 students will be admitted through the respective departments and they will undergo specialisation in composite materials development, composites manufacture and composites design at this Centre. The scholarship/half time research assistance will be provided initially from sponsored projects and later with the financial assistance of the composite materials industries in the country.

2. Academic Programmes:

During the year, the Centre has offered three elective courses, one to the undergraduate students and two to the post graduate students.

2.1 New Courses Introduced

S.No.	Course No.	Title	Structure	Faculty
1.	CT601	Composite Materials and Manufacturing	3 0 0 3	Faculty of the Centre
2.	CT610	Processing Technology of Composites' raw Materials	3 0 0 3	-do-
3.	CT700	Composite Materials Science	3 0 0 3	-do-
4.	CT712	Modeling and Equipment Design for Composites Processing	3 0 0 3	-do-
5.	CT714	Testing, Characterisation and Quality Assurance for Composites Production	3 0 0 3	-do-
6.	CT720	Composite Product Design	3 0 0 3	-do-
7.	CT722	Composites Analysis and Design using	3 0 0 3	-do-

S.No.	Course No.	Title	Structure	Faculty
		Computers		
8.		Composites Laboratory-I	0 0 3 1	-do-
9.		Composites Laboratory-II	0 0 3 1	-do-

2.2 Students on Roll (as on 30th Sept. 1996)

Programme	I Year	II Year	III Year	IV Year	V Year	Total
M.S.	1	-	2	-	-	3
Ph.D	1	-	2	1	1	5
Total	2	-	4	1	1	8

2.3 Number of scholarship/fellowship holders:

Programme	Institute Scholarship	Others	Total
M.S.	1	2	3
Ph.D	3	2	5
Total	4	4	8

2.4 Number of Degrees Awarded In the last convocation

Programme	Number
M.S	2
Ph.D	2
Total	4

3 Faculty and their Development:

3.1 Faculty

Name and Qualification

Chief Design Engineers

Dr.N.G.Nair, Ph.D.(IIT Kanpur)[Head]

Major Areas of Specialisation

Composite Materials Research and Development (including Polymer, Metal and Ceramic Matrix Composites), Composites Manufacturing, Composite Product Design and development Testing and Quality Assurance In Composites.

Dr.S.K.Malhotra, PhD.(IIT Madras)

Composite Materials Research, Composite Product Design and Development, Quality Control of Composites.

3.2 Short-term Courses/Workshops/Seminars/Symposia/Conferences Organised by the Department

S.No.	Co-ordinators	Title of Workshop/Seminars/Symposium/Conference	Period
1.	Dr.N.G.Nair	Design & Manufacture of FRP Building Components	6.5.96 to 11.5.96
2.	Dr.N.G.Nair	Workshop on FRP Technology	23.10.96 to 5.11.96
3.	Dr.N.G.Nair	Design and Manufacture of FRP Chemical Plant Structures	17.2.97 to 22.2.97

3.3 Short-term Courses/Workshops/Seminars/Symposia/Conference/Training attended by the Faculty in recognised Academic Institutions and Public Sector Units

S.No.	Name of Faculty	Title	Period/Duration
1.	Dr.S.K.Malhotra	National Seminar on Composite Product Development, NAL Bangalore	April 22-23
2.	Dr.N.G. Nair	National Seminar on Composite Product Development, NAL Bangalore	April 22-23
3.	Dr.S.K.Malhotra	6th National Seminar on Aerospace Structures, NAL, Bangalore	Nov.7-8, 1996
4.	Dr.N.G. Nair	International Conf. on advances in Composites at IISc, Bangalore	Dec.18-20 1996
5.	Dr. N.G. Nair	Eighth Annual General Meeting of Material Research Society of India at BARC, Mumbai	Feb.10-12 1997

3.4 Special Lecture(s) Delivered by the faculty in other Institutions

S.No.	Name of Faculty	Topic of Lecture	Venue & Date
1.	Dr. N.G. Nair	Current Technological Problems Facing FRP Industries	Seminar-cum-Workshop at Coimbatore, organized by All India Reinforced Plastics Moulders Association 24.5.1996
2.	Dr.S.K.Malhotra	Compression Moulding & Compression Mould Design	CIPET, Madras 24-5-96 & 27-5-96

S.No.	Name of Faculty	Topic of Lecture	Venue & Date
3.	Dr.N.G. Nair	Design of Composite Products	CIPET, Madras 27.5.1996
4.	Dr.N.G. Nair	Advanced Metal Matrix and Ceramic Matrix Composites	Indian Institution of Metals Madras Chapter, Oct.10-11,1996
5.	Dr.N.G. Nair	GRP properties and Design considerations	CIPET Madras, 19.3.1997
6.	Dr.N.G. Nair	Special features of Composite Product Design	CIPET Madras 21.8.1996 to 19.11.1996

3.6 Honours and Awards

S.No.	Name of Faculty	Honours/Awards	Purpose
1.	Dr.N.G.Nair	MRSI Medal 1997 awarded by Materials Research Society of India	For outstanding contribution in the field of Composites Technology

3.10 Memberships in Professional Bodies

Dr. S.K. Malhotra Member of New York Academy of Sciences

4. Design and Development Activities:

4.1 Brief and Specific details of Process/Instruments/Equipment/Software Designed and Developed

1. Design of Autoclave cum Pressurebag Moulding facility for Composite Product Manufacture.
2. A 5000 joules capacity drop weight Impact Test Facility

4.2 New Facilities added and Major Equipment procured

1. Dual Channel storage oscilloscope (HP)

5. Research and Consultancy:

5.1 Sponsored Projects on hand (only ongoing)

S.No.	Title	Period	Funding Agency	Amount (Rs.in lakhs)	Co-ordinator(s)
1.	Development of Orthotic Knee and Hip joints with composites for energy efficient walking of Paraplegics	3 Years	DST	6.07	Dr.N.G.Nair

S.No.	Title	Period	Funding Agency	Amount (Rs.in lakhs)	Co-ordinator(s)
2.	Design and development of Mechanically deployable Composite Bridge by pressurebag/autoclave Moulding	3 Years	MHRD	68.15	Dr.N.G.Nair
3.	Development of Nylon Reaction Injection Pultrusion (NYRIP) for making Fibre Reinforced Nylon Structural Profiles	2 Years	MHRD	39.44	Dr.N.G. Nair
4.	Design, Development and Fabrication of FRP Sonar Dome employing Pressurebag Moulding Method	2 Years	-do-	40.74	Dr.N.G.Nair
5.	Development of Design expertise Manpower training and Technical support program for Promoting Composites Material Technology and Its Industrial Applications	3 Years	TIFAC New Delhi	115.00	Dr.N.G.Nair
6.	Studies on Machining of FRP	2 Years	ISRO- IIT(M) Space Tech.Cell	4.55	Dr.S.K.Malhotra

5.2 Industrial Consultancy (only on going)

S.No.	Title	Industry	Value (Rs.in Thousands)	Co-ordinator
1.	Development of Ceramic Fibres and Ceramic Composites	DRDL	4,04,700	Dr. N.G. Nair
2.	Thermo Mechanical Analysis and Design of Ceramic Matrix Composites	DRDL	5,32,450	Dr.N.G.Nair
3.	Design of FRP chimney and hood over granulation pit	SAIL	25,000	Dr.N.G.Nair
4.	Design and Development of FRP cooling tower blades	Adanced Reinforced Plastics P. Ltd.	50,000	Dr.N.G.Nair
5.	Testing consultancy under Composites Test Facility	-	2,20,000	Dr.N.G.Nair

5.4 Retainer Consultancy (only on going)

S.No.	Name of Faculty	Title	Industry
1.	Dr. N.G. Nair	Retainer Consultant	Gandhi and Associates, Baroda

5.5 Research Publications

(a) Journals

1. M.Subramanian, S.K.Malhotra and R.Krishnamurthy, "Interesting fractographic observations on rubber-modified epoxies", JI. of Materials Science Letters, V-15, 1996, PP. 576-578.

(b) Conferences (Papers presented to the Conference)

1. S.K.Malhotra and G.Santhanakrishnan, "Development of FRP vibration Test Fixture for PSLV stack", proc. of National Seminar on Composite product Development, NAL, Bangalore, April 22-23, 1996, pp. 83-83.
2. S.K.Malhotra, M.Subramanian and R.Krishnamurthy, "Damping and work of fracture studies on toughened epoxy Composites", Proc. of Intl. Conf. on Composites Science and Technology", June 18-20, 1996, Durban, South Africa, PP.329-334.
3. S.K.Mahotra, "Fracture toughness of random fibre reinforced polymer Composites", proc. of Sixth National Seminar on Aerospace Structures (6th NASAS), Nov.7-8, 1996, NAL, Bangalore, PP.77-81.
4. V.Venkateswara Rao and S.K.Malhotra, "Repair of Cracked aluminium structures using glass fibre/epoxy composites", proc. of 2nd Intl. conf. on Advances in Composites, 18-20 Dec, 1996, IISc, Bangalore, PP.77-80.
5. V.Sampath, V.Sethuraman and N.G.Nair, "Studies on Friction and Wear characteristics of Non-Asbestos based Friction Composites." International Conference on Advanced Composites, IISc, Bangalore, Dec, 1996.
6. N.G.Nair, "Development of Composite Materials and their Manufacturing processes", MRSI Medal Lecture, Annual General Meeting of Materials Research Society of India, BARC, Feb. 1997.

7. Any other relevant details:

Dr.N.G.Nair	Member	Technical Advisory Council Structures Division, NAL Bangalore
	Member	Technical Advisory Council, Materials Science Division NAL Bangalore
	Member	PAC/DST on Composites

4.16 Materials Science Research Centre

1. Introduction:

Materials Science Research Centre (MSRC) was established in 1975. The major areas of teaching and research of the Centre are:

1. Ternary Superconductors Low T_c and High T_c :

Synthesis characterization and study of T_c , H_c^2 , and other parameters - Efforts to correlate T_c with known structure-related properties - studies on improvement of T_c of copper oxides and search for non-copper oxide high T_c superconductors. Efforts to improve current densities in Bi-2212 superconductor using melt processing technique.

2. Layered Transition Metal Dichalcogenides and Intercalation Compounds:

Synthesis, crystal growth and characterization and measurement of physical properties including T_c ; study of electrochemical properties including intercalation and application as battery cathode materials.

3. Perovskite Mixed Oxides:

Formulation, synthesis and characterization of new and novel rare earth containing perovskite mixed oxides - crystal growth by flux techniques - Study of electrical and magnetic properties - Search for magnetic and semi-conductor-to-metal transitions. Application in solar energy conversion.

4. Pyrochlore Mixed Oxides:

Formulation, synthesis, characterization of new and novel rare earth-transition metal pyrochlore mixed oxides - Study of their electrical and magnetic properties correlations - Applications in solar energy conversion; thermoelectric power conversion.

5. Solar Energy Conversion/Storage using Semiconductors in Photoelectrochemical (PEC) Cells:

Electrolyte solar cells for solar energy conversion employing chalcogenide and pnictide semiconductor electrodes (anode and cathode) - Formulation and study of new electrolytes with known electrodes. Solar energy storage as hydrogen through photoassisted electrolysis of water employing pure and mixed (perovskite, pyrochlore, spinel and scheelite type) oxide anodes. Study of oxide bronze and hollandite and related materials for PEC Conversion.

6. Fast Ion Conductors:

Fundamental studies on ion mobility and structure property correlations in fast ion conductors (channel type oxides and phosphates) and pyrochlore structures.

7. Nuclear Waste Disposal Materials:

Study of crystalline mixed oxide and phosphate systems with a view to fix radioactive ions for nuclear waste disposal applications.

Magnetoresistance Studies:

MR studies on Giant Magnetoresistance (GMR) perovskites, magnetics and intermetallics.

2. Academic Programmes:

M.Tech.	-	Solid State Technology
Ph.D.	-	Advanced Solid State Chemistry

2.2 Students on Roll:

Programme	I Year	II Year	III Year	IV Year	V Year	Total
B.Tech	-	-	-	2	-	2
M.Sc.	-	6	-	-	-	6
Ph.D.	-	-	3	-	2	5
Total	-	6	3	2	2	13

2.3 Number of Scholarship/Fellowship holders (as on 30th Sept. 1996)

Programme	Institute Scholarship	Others	Total
Ph.D.	5	-	5

2.4 Number of Degrees Awarded In the last convocation:

Programme	Number
Ph.D.	5

3. Faculty and their Development

Name and Designation

Major area of Specialisation

Professor

B. Viswanathan, Ph.D.(IIT Madras)[Head]

Materials Science, Catalysis, Hydrogen Energy

G.V. Subba Rao, Ph.D.(IIT Kanpur)

Materials Science and Solid State Chemistry

FRSC (London), C.Chem.FAIC (USA), F.I.A.Sc., (Ind.),

High Tc ternary superconductors Solar Energy

FNA(Ind.)[Director, CECRI, Karakudi (on leave)]

Conversion and storage using PEC cells

Associate Professor

U.V. Varadaraju, Ph.D.(IISc. Bangalore)

Materials Science and Solid State Chemistry. High Tc superconducting Materials, High temperature oxide and phosphate based ceramics, R&D new materials for nuclear waste disposal. Fast ion conductors

Assistant Professor

M.S. Ramachandra Rao, (Ph.D.(IIT Kharagpur)

Solid State Physics, Materials Science, Oxide electronic Materials, Magnetic Materials, HTSC, Advanced Ceramics, Intermetallics and thin films

Technical Officers(SG)

V.S. Subramanian, M.S.(IIT Madras)

Electronic and Instrumentation

K. Chandrasekaran, M.Sc.(Univ. of Madras)

X-ray and chemical analysis, Phys. Studies

3.2 Short-term Courses/Workshops/Seminars/Symposium/Conference/Training attended by the Faculty in recognised Academic Institutions and Public Sector Units:

S.No.	Name of Faculty	Title	Period/Duration
1.	U.V. Varadaraju	Workshop on Solid State Chemistry, Mangalore Univ. Mangalore	Nov. 1996
2.		CRISMAT, USMRA, France Indo-French Project	May 15-July 13, 1996
3.		Indo-UK Royal Society Meeting, Bangalore	Dec. 1996
4.	M.S. Ramachandra Rao	Int. Conf. on Advance in Superconductivity New Materials, Critical Currents and Devices, ASMCCD 96, held at TIFR Mumbai	Sept.19-20, 1996
5.		Indo-French workshop on Recent trends in Magnetism and Magnetic Materials, Udaipur, India	Nov. 3-7, 1996
6.		Advanced semiconducting materials organised by the Dept. of Physics, IIT Madras	Dec. 1996.

3.4 Special Lectures delivered by the faculty in other Institutions:

S.No.	Name of Faculty	Topic of Lecture	Venue and Date
1.	U.V. Varadaraju	Indo-UK Royal Society Meeting	Bangalore, Dec. 1996
2.	M.S. Ramachandran Rao	Indo-French Workshop on Recent trends in Magnetism and Magnetic Materials	Udaipur, India Nov. 3-7 1996

3.5 Visits Abroad

S.No.	Canem of Faculty	Country Visited	Date	Purpose of visit
1.	U.V. Varadarju	France	May 1996	Indo-French Project

3.6 Honours and Awards:

Prof.B. Viswanathan Head MSRC has been elected as President of Catalysis of India for 2 years term 1997-1998.

3.7 Design and Development Activities:

Designed and fabricated a sample holder attachment for the closed cycle He refrigerator cold head with exchange gas (He) facility to facilitate magnetoresistance studies on bulk polycrystalline samples and thin film.

Apparatus for the study of I-V characteristics of varistors has been set-up.

4.1 New Facilities added and major equipment procured:

Lock-in-Amplifier Model No. EG&G 7260 DSPP

Programmable temperature controller 340o (Lakeshore, USA)

5. Research and Consultancy:

5.1 Sponsored Projects (only ongoing):

Title	Period	Funding Agency	Amount (In Lakhs)	Co-ordinators
Preparation of high quality Bi-Sr-Ca-Cu-O Superconductor by melt texturing for application	2 years	DST	3.00	M.S. Ramachandra Rao

5.2 Research Publications:

International Journal:

1. Senthilkumar, S. Ravi, G. Rangaraja, U.V. Varadaraju, Magnetism and critical state models in YNi_2B_2C , Czechoslovak J. of Physics, 1996, 46, 837-838.
2. M.C. Shekar, B. Gopalakrishnan, U.V. Varadaraju, S.V. Suryanarayana, Superconductivity in the Bi-Sr/K-Ca/Na-Cu-O system, Superconductor Science and Technology, 1996, 9, 756-760.
3. P. Sumana Prabhu and U.V. Varadaraju, Effect of 3rd Ion substitution in the $RBa_2Cu_{3-x}MxO_{10}$ (R=Sm, Dy; M=Fe, Ni and Zn) system; Implications of R-ion dependence and disorder, Phys. Rev. B.53, 1996, 14636-14646.

4. G.V. Rama Rao, U.V. Varadaraju, S. Venkadesan and S.L. Mannan, Synthesis of (Bi, Pb)₂ Sr₂Ca₂Cu₃O₁₀, superconductors by sol-gel process, J. Solid State Chem., 1996, 126, 55-64.
5. A. Sundaresan, D. Pelloquin, A. Maignan, M. Hervieu, C. Michel, U.V. Varadaraju and B. Raveau, Evidence of new layered cuprates in the H_a-A-Gd-O system (A=Na,Sr), J. Mater. Chem. 1996, 6(9), 1549-56.
6. M. Murugesan, M.S. Ramachandra Rao, L.C. Gupta, R. Pinto, M. Sharon and R. Vijayaraghavan, Strong Rare Earth (RE) size dependence on T_c in RE Sr₂ Cu_{2.85} Re_{0.15} O_y, Phys. Rev.B, 53, 1996, 8604.
7. M.S.R. Rao, C.P. D'souza, P.R. Apte, R. Pinto, L.C. Gupta, S. Srinivas and A.K. Bhatnagar, Microstructural study of Yttria stabilized zirconia buffered sapphire for YBa₂Cu₃O₇ thin films, J. Appl. Phys. 79, 1996, 940.
8. K.A. Gnanasekar, M. Sharon, R. Pinto, S.P. Pal, M.S.R. Rao, P.R. Apte, A.S. Thamana, S.C. Purandare, L.C. Gupta and R. Vijayaraghavan, Pulsed laser ablation. A new route to synthesize novel superconducting compound as oriented films, J. Appl. Phys. 79, 1996, 1082.
9. R. Pinto, D. Kaur, M.S.R. Rao and P.R. Apte, Microstructural dependence of penetration depth of Ag-doped YBa₂Cu₃O_{7-x} thin films probed by atomic force microscopy, Appl. Phys. Lett. 66, 1996, 1720.
10. R. Pinto, P.R. Apte, M.S.R. Rao, R. Chandra, C.P. D'souza, S.P. Pal, L.C. Gupta R. Vijayaraghavan, K.J. Gnanasekhar and M. Sharon, Superconducting and transport behaviour of laser ablated Au-added YBa₂Cu₃O_{7-x} thin films, Appl. Phys. Lett. 65, 1996, 1006.
11. M.S.R. Rao, P.R. Apte, S.P. Pal, K.L. Gnanasekar and R. Pinto, Improved performance and stability of Au-doped YBa₂Cu₃O_{7-x} thin films for microwave devices, Journal Proc. of the SPIE (copy right IEE) 2539, 1996, 30.
12. Murugesan, P. Selvam, M. Sharen, L.C. Gupta, R. Pinto, M.S.R. Rao, C.S. Gopinath and S. Subramaniam, Oxidation state and superconducting properties of Y_{1-x}Pr_xSr_xCu_{2.85}Re_{0.15}O_{7+x}, J. Appl. Phys. 80, E 1996, 6884.

13. Distinguished visitors to the Department:

S.No.	Visitors Name and address	Date	Purpose of visit
1.	Dr.S. Venkataraman Dept. of Elec. & Comp. Science, Pittsburg, USA	08.06.96	To deliver a Talk and discussion
2.	Dr.Om Prakash IIT Bombay	06.07.96	To conduct viva-voce examination
3.	Dr.M. Srinivasan BARC Bombay	22.07.96	To deliver a talk
4.	Dr.Alonso Vante Germany	07.8.96	To deliver a talk
5.	Prof. Fujishma Univ. of Tokyo, Japan	02.08.96	To deliver a talk

S.No.	Visitors Name and address	Date	Purpose of visit
6.	Prof. F. Studer CRISMAT, France:	07.02.97	To deliver a talk
7.	Dr. Jurgen Hauck IEE-KFA Research Centre Germany	08.12.96	To deliver a talk
8.	Dr. P. Krishnan CNRS, France	07.11.96	To deliver a talk
9.	Dr. Karel Knizek Czech Republic	12.12.96	To deliver a talk
10.	Prof. F.J. Berry Head.The Open Unlversity, U.K.	04.02.97	To deliver a talk and discussion
11.	Dr. JulIn Christian CNRS Lab. France	12.02.97	To deliver a talk
12.	Prof. Gopalakrishnan IISc. Bangalore	15.02.97	To conduct viva voce examination
13.	Prof. Jeltschko Director, Univ. of Munster, Germany	06.03.97	To deliver a talk

4.17 Computer Centre

1. Introduction:

The Computer Centre was established in 1973 and provides Central Computing resources - facility and support. The Centre started with IBM 370 and changed over to SIEMENS 7580-E in 1987. The mainframe was complemented with MX500 running Unix and several micro computers and PCs to support research and development in various areas. Applications for the institute are also supported. The Siemens systems were shutdown with effect from Nov.95. The present IBM RS 6000 models 590 and 370 offer powerful numerical performance. Multiple computing units on a high speed network provide parallel (loosely coupled) and distributed computing platforms for research and development. The facilities at the Computer Centre will enable students to learn the state-of-the-art computing techniques and methodology for problem solving in analysis and design. The installation provides new opportunities for computing for students and faculty apart from rendering the centre as one of the most modern among its peer academic institutes in the country.

The PC Maintenance cell provides services for repairs and maintenance of PCs in the institute including projects totalling to about 900 machines. In addition Computer Centre has been serving the total computerisation of the following establishments of the IIT:

- | | |
|------------------------|-------------------------------|
| I) Administration | v) Engineering Unit |
| II) Finance & Accounts | vi) Guest House Accommodation |
| III) Hospital | vii) Hostels |
| IV) Library | viii) Stores & Purchase |

2. Details of Staff

Name and Qualification

Major Area of Specialisation

Head

Sastry V V, Ph.D

Object oriented modelling & Simulation, Computers for real-time control, Computer Graphics, Enterprise Computing

Senior Systems Engineer

Dheenadayalu R, M.Sc(Engg)

Data Centre Operations, System Administration, Application Software System selection.

Senior Systems Programmer (SG)

Ramanujam M K, Ph.D

Systems Programming, Operating Systems, Computer Networks

System Engineers

Jayaprakash S, M.S

Programming Methodology, Computer Networks, Fault-tolerant Distributed Systems.

Ramesh S K, M.S

MIS, Data Management, Data Processing, Syst Programming.

Systems Engineer Gr.I

(Ms.) Vatsala, M.S.

System Analysis & Design, Application Software Dev., Systems Programming, Database Management.

Systems Officer Gr I

Sourirajan C S, M.Sc.

System Administration, Programming Languages, Small Computers, Application Software Development.

(Mrs) Vijayalakshmi Sirohi, Ph.D.(on leave)

Software Engineering, Database Management Systems, Numerical Computing, Application Software, Parallel Computing, System Analysis & Design, Systems Programming .

Assistant System Engineer

Baman Banavath B.Tech(C.S)

System Analysis & Design, Database Management Systems, DOS Utilities.

Senior Systems Officers

Ravichandran V, M.Sc.

Application Programming, Database Management systems, System Operations, Networking, Systems Programming

Vijayaraghavan C N, M.Sc. & PG In Ind. Maths.

Computer Applications in Industry, Operating Systems, Systems Operation/Administration, Networking.

Junior Systems Officers

Ramalingam S, M.Sc (Comp.Applins)

System Analysis and Design, Database Management Systems, Software Development (Unix)

Junior Systems Engineer

Sreekumar P Y, B.Tech(C.S)

Database Management Systems, Systems Programming, Application Programming.

3. System Trainees on Roll: (1995 - 97)

S.No.	Name
1.	Asha C
2.	S Jamuna
3.	S Jayalakshmi

S.No.	Name
4.	Kanderl Sarath Babu
5.	Kovvuru Prakash Rao
6.	S Muralidharan
7.	M Sivakumar
8.	R Subramanian
9.	S Thangam
10.	S Magesh Kumar
11.	K Sampath Kumar
12.	R Radhika
13.	Manu T G

4. New Facilities/Equipment Added:

Additions:

HARDWARES

2 numbers Silicon-Graphics make and 6 number Hewlett-Packard make Workstations for Graphics users.

SOFTWARES

Engineering/CAD/Simulation

NISA, SABER & MATLAB

Applications Development Laboratory

The laboratory is used as support for the professional work in Computer Centre and as platform for development and transfer for Institute and other applications.

NETWORKING

Radio connectivity (64 Kbps) to VSNL was established in Dec 1996. Connectivity to Administration Building, Chemical Engineering, Electrical Engineering, ME&MH, Metrology, Ocean Engineering departments were also established using existing serial lines and Remote Ether switches at 144 Kbps. Internal networking in Computer Centre was reorganised and strengthening using Hubs and cables.

5. Short Term Courses/Workshops Attended by the Staff:

S.No.	Name of the State	Name of the Workshop	Venue and Date
1.	C N Vijayaraghavan	Industrial Mathematics workshop at University at Kaiserslautern, Germany	September - 1996 duration - 3 weeks.

6. Staff Served In Committees:

- R Dheenadayalu a) Member In the Committee for Staff Welfare
 b) Selection committee for trainees In Central Electronics Centre
 c) Selection committee for trainees In PC cell

7. Institute Projects:

S.No.	Title	Coordinators	Trainees
1.	Hospital Information System	R Dheenadayalu	Ms Radhika
2.	JEE Data Processing	C S Sourirajan P Y Sreekumar	-
3.	GATE Data Processing	S K Ramesh V Ravichandran	-
4.	M.Tech Admission	S K Ramesh V Ravichandran	-
5.	CARS/ARMS System Management	S K Ramesh Santosh Arvind	Muralidharan Ms Jayalakshmi Manu
6.	Stores & Purchase Management	Dr (Mrs) Sirohi	Ms Jayalakshmi Subramanian
7.	CLAM Management- Library	Ms Vatsala Mr S Ramalingam	Ms Asha Sampath Kumar Sarath Babu
8.	Hostel Mess Management	C S Sourirajan Santhosh Arvind	Muralidharan Ms Thangam
9.	Hostel Billing System	C S Sourirajan V Ravichandran	-
10.	Taramani Guest House Automation System	Baman	Ms Asha Sivakumar Prakash Kumar
11.	Employee Database for IIT	P Y Sreekumar	-
12.	Terminal Benefit System for IIT	Santhosh Arvind	Manu Ms Jamuna

8. Sponsored Projects:

S.No.	Title	Period	Funding Agency	Amount (Rs.In Lakhs)	Co-ordinator(s)
1.	GIS Lab. for Engg Appl. under Thrust Area In Tech. Education	1996-1998	AICTE	7.00	S.K. Ramesh
2.	Applications of	1995-1997	AICTE	8.00	Dr M K Ramanujam

S.No.	Title	Period	Funding Agency	Amount (Rs.in Lakhs)	Co-ordinator(s)
	Computer Graphics - under Modernisation				
3.	Retainer Consultant	-	Complete Business Solutions (I) Madras	-	S Jayaprakash
4.	Object oriented modelling of Power Electronics Systems	-	Volkswagen Foundation, Hannover, FRG	14.00 (DM 63.000)	Prof V V Sastry
5.	Variable-speed Constant frequency generator applied to sea-wave energy extraction	-	NIOT, Delhi	16.00	Prof V V Sastry

9. Consultancy Projects:

S.No.	Title & Industry	Amount (Rs.in Thousands)	Period	Co-ordinator(s)
1.	Re-engineering of PL/I for M/s INFOSYS, Madras	72.00	21.8.96 to 30.8.96	Dr M K Ramanujam
2.	Re-engineering of PL/I for M/s TCS, Madras	80.00	30.9.96 to 11.10.96	Dr M K Ramanujam
3.	System Studies for M/s Shaw Wallace Madras	15.00	1.4.96 to 31.10.96	S K Ramesh & C N Vijayaraghavan
4.	Re-engineering PL/I for M/s CBSI Madras	70.00	1.11.96 to 10.11.96	Mr S Jayaprakash
5.	Educational Consultancy for M/s Peacock Madras	200.00	1.9.96 to 31.8.97	Dr M K Ramanujam
6.	Hardware Consultancy for M/s Peacock, Madras	100.00	1.1.97 to 31.12.97	R Dheenadayalu
7.	Mainframe Training for M/s BCC, Madras	250.00	3.2.97 to 5.3.97	Dr M K Ramanujam
8.	Power Quality Issues in a substation lay out Having Power Electronic Loads SPB Projects & Consultants Ltd. Madras	50.00	Jan. 97	V V Sastry, R K Thirumala and M Krishnamurthy
9.	Resonant link based AC-DC Power Supplies for UPS	50.00	Dec. 96	V V Sastry, V R Durgesh

S.No.	Title & Industry	Amount (Rs.in Thousands)	Period	Co-ordinator(s)
	applications Tetra Controls Pvt Ltd., Chennai 600 041			

10. Research Publications:

1. S Jayaprakash and C R Muthukrishnan, "A permission based fault-tolerant distributed mutual exclusion algorithm", International Journal of Computer Systems Science and Engineering (Accepted for publication).
2. S Jayaprakash and C R Muthukrishnan, 'Critical Analysis of A fault-tolerant algorithm of mutual exclusion in a distributed system', The Journal of Systems and Software, Dec'96.
3. S Jayaprakash and C R Muthukrishnan, A dynamic tree based fault-tolerant distributed mutual exclusion algorithm, Fourth International Conference on Advanced Computing, Bangalore, Dec.1996.
4. V V Sastry, "Electric Power Sector In India-Crisis & Opportunities", International Symposium, Alexander Von Humboldt Foundation, Bad Honnef at Bonn, FR Germany, 14-17 April 1997.
5. V V Sastry, "Object - Oriented Modeling and Design of Engineering Systems", National Seminar on Engineering Education for 21st Century, Indian National Academy of Engineering, January, 1997, pp.24-32.
6. V V Sastry, T M Rangarajan & T V Sivakumar, "A PC Based Object - Oriented Modeling and Simulation of Power Electronic Systems", National Symposium on Power System Instrumentation & Control, December 26-27, 1996, CPRI, Bangalore, pp.217-223.
7. J J Jayapragash, T V Sivakumar & V V Sastry, "Object-oriented Modeling Simulation and Optimisation of Power Electronic Circuits", IEEE, PESC, June 1996, Baveno, Italy, pp.581-585.

11. Books Published:

1. R Dheenadayalu C++ and Databases M/s Tata Mc Graw Hill Publishing Company, 1996-97

12. Lectures Delivered:

The following lectures are given by the staff for various Industries/organisation

S.No.	Staff	Topic	Organisation
1.	Dr M K Ramanujam	PL/I, CICS, VSAM	BCC, Madras TCS, Madras CBSI, Madras INFOSYS, Bangalore
		Operating Systems	Peacock, Madras
2.	R Dheenadhayalu	MS Excel	Peacock, Madras
3.	S K Ramesh	COBOL, DB2	BCC Madras TCS Madras

S.No.	Staff	Topic	Organisatlon
4.	S Jayaprakash	PL/I, CICS	BCC Madras CBSI Madras
5.	C S Sourirajan	COBOL	BCC Madras
6.	Ms Vatsala	PL/I	BCC Madras
		MS Access	Peacock Madras
7.	Mr Santhosh Arvind	DB2	BCC Madras
8.	Baman	MS Word-Power Point	Peacock Madras
9.	V Ravichandran	PL/I Cobol	BCC Madras Infosys Bangalore TCS Madras CBSI Madras
10.	C N Vijayaraghavan	JCL	BCC Madras
11.	S Ramalingam	DB2	BCC Madras
		Unix & C	Peacock Madras
12.	P Y Sreekkumar	DB2	BCC, Madras

13. US Patent Applications:

S S Venkata, N R Raju, R A Kagallwala and V V Sastry, Active power conditioner for reactive power and harmonic Compensation, U S Patent Application, No.08/667, 924, June 20, 1996.

4.18 Centre for Industrial Consultancy and Sponsored Research

Introduction

The Centre for Industrial Consultancy and Sponsored Research is responsible for providing support for the management of consultancy and sponsored research projects sanctioned to the Institute and also for promoting industrial and liaison activities of the Institute. These are:

- * Sponsored Research Programmes
- * Plan Schemes
- * Technology Development Mission Schemes
- * Consultancy programmes
- * Collaborative research with foreign countries
- * Industrial Associateship Scheme
- * ISRO-IITM Cell joint projects sponsored by ISRO
- * Projects sponsored by National Institute of Ocean Technology
- * Entrepreneurship Development Programmes
- * Technology Transfers
- * Patents, etc.

Staff:

Prof K V S Rama Rao, Ph.D.	Dean
Dr D Balakrishnan, Ph.D.	Chief Techno Economic Officer
Y G Narasimha, B.E. D.I.I.Sc.	Senior Techno Economic Officer
R Sundaram, B.Tech. PGDIE	Senior Techno Economic Officer
M Rajasekaran, M.Sc. DBA, PGDMM	Assistant Registrar
P Ramachandran, M.Com.	Asst Registrar(F&A)/c
M S Krishnamurthy, M.Sc. AMIE	Special Officer (Project Purchase)

Sponsored Research:

52 Projects of value totalling to Rs 983 lakhs were handled during 1996-97.

Plan Schemes:

Plan Schemes of Ministry of Human Resources Development sanctioned to the Institute in the emerging areas such as CAD-CAM, VLSI, Telematics, Fibre Optic Communication, Environmental Engg. etc. have continued.

Consultancy Programmes:

The total value of consultancy assignments was Rs. 355 lakhs in 1996-97. Research Based Industrial Consultancy activity contributes nearly 34% (Rs 121 lakhs) of the total value of the assignments. Also 16 faculty were retained as consultants of various industries. Interdisciplinary programmes for providing consultancy to Tamilnadu Pollution Control Board and Tamilnadu Minerals Ltd. continued.

Collaborative Research Projects:

Ten joint research projects have been taken up through BMBF, Germany apart from the earlier six GTZ ongoing projects for development of facilities in Catalysis, Material Sciences, Electronics, Production Engineering, Metallurgy and Ocean Engineering Centre, which have continued. Also projects under Indo-US and Indo-EEC, Indo-French, etc., have continued.

Industrial Associateship Scheme:

The response from the industry towards this scheme has been highly encouraging. More than 250 industries are members of this Scheme. (Large scale - 25, Medium scale - 116 & small - 117). The following Technology Appreciation Programmes were organised.

- Photovoltaics for Terrestrial and Space Applications
- Plate Heat Exchangers: The New Wave
- Robotics: Its Appreciation and Adoption in India
- Synchronous Manufacturing a new Approach to Job Scheduling
- Multimedia Technology and Applications
- Refrigeration under Cryogenic Conditions

Facilities of the departments/ Centres were thrown open during the Open House organised on 16th & 17th Jan 1997.

Abstracts of M.Tech programmes were published for the benefit of the Associates.

Other programmes:

IGCAR Cell:

An MoU has been signed with IGCAR for taking up joint research projects. Three projects have been sanctioned during the year.

ISRO-IITM Cell Joint Projects:

This is an ongoing research activity sponsored by the Indian Space Research Organisation where research projects of interest to ISRO are being taken. 5 new projects were taken up during the year. Review of the projects were carried out in Feb 97.

Patents:

During the year, applications have been made for taking 7 patents in the name of the Institute.

Visitors:

The following is the list of visitors:

S.No.	Name and Occupation	Date of Visit
1.	Dr. William Blanpled Senior International Analyst, National Science Foundation Arlington, USA	5th April '96.
2.	Dr. Seshu Bhagavathula Daimler Benz Research Center, Germany	16th April '96
3.	Mr. Thomas M. Grant World-wide New Markets Training Manager. Ford Motor Company, USA along with Mr. A.I. Solvay, Mahindra Ford India Ltd.	16th May '96
4.	Mr. Schroll UNDP Expert, Centre for International Migration, Germany	27th May '96.
5.	Prof. P.M. Makhurane Vice-Chancellor, National University of Science and Technology, Zimbabwe	7th June '96.
6.	Mr. S. Ramadoral Chief Executive, Tata Consultancy Services Limited, Madras	30th September '96
7.	Delegation from Siemens Ltd., Germany along with representatives from Siemens Ltd., Madras	12th October '96
8.	Ms. Raveena Singh, AIEF Coordinator from Canberra for the Australia India New Horizon programme	18th October '96
9.	Dr. Deepak K. Sharma Project Manager, The Dow Chemical Company, Michigan, USA	23rd October '96
10.	Dr. Ashok K. Dhingra Director, Corporate India Technology Office, DuPont Central Research Development, USA	5th November '96
11.	Prof. Satish Udpa and Dr. (Mrs) Lalitha Udpa Iowa State University of Science & Technology, Iowa, USA	24th December '96
12.	Dr. R. Balasubramaniam Counsellor (S&T), Embassy of India, Bonn, Germany	6th January '97
13.	Dr. Krishna R. Dronamraju President, Foundation for Genetic Research, Houston, Texas, USA	11th January '97
14.	Team of Experts from the Institute of Cost and Works Accountants of India, Southern Regional Council	22nd January '97
15.	Dr. Pierrew Avenas Vice President (World-wide R & D), Elf Atochem, France	6th February '97
16.	Mr. Robert Gohelin	20th February '97

S.No.	Name and Occupation	Date of Visit
17.	Former US Ambassador to India Prof. Dipl.-Ing. Richard Aubele Vice President, FHTE, Germany	February '97

Technology Development Missions:

In this Programme, IIT Madras is given the responsibility of implementing the following two Missions as a lead Institute.

1. New Materials
2. Energy Efficient Technologies & Devices

MoUs signed by IIT Madras with other Organisations/ Institutions during 1996-97 for consultancy/ sponsored projects/ other research activities

April 1996	Sameer, Bombay for Development of Passive Integrated Optics Devices by Ion Exchange
May 1996	Port of Visakhapatnam for Construction of Multipurpose Berth In Visakhapatnam Outer Harbour
June 1996	DRDL Hyderabad for Thermo-Mechanical Analysis & Design of Ceramic Matrix Composites
June 1996	IGCAR, Kalpakkam for creation of a Cell for taking up joint research projects
July 1996	Acacia Networks, USA for technology transfer in the area of Networking
July 1996	National Institute of Ocean Technology at IIT Campus
July 1996	Banyan Networks for design & devpt of advanced DSP-based computer networking products
July 1996	NSTL, Vizakhapatnam
Aug 1996	LPSC, VSSC for Modelling aspects of the steering engine for GSLV.
Sep 1996	Shinshu University
Sep 1996	ICF for a consultancy work
Oct 1996	IAEC Industries, Madras for a Technology Devpt. Mission project on "Vapour Absorption Heat Pump - Chiller"
Oct 1996	Xtalonix Prods. Inc., USA for "developing dielectric resonator ceramic for microwave application"
Oct 1996	Tata Telecom for ISDN Terminals
Oct 1996	L & T ECC Construction Group, Madras
Oct 1996	ISRO through LPSC, VSSC for Dynamic Analysis of the Turbine Blade & DISC and Impeller DISC of fuel and Oxidiser pumps of main turbopump and booster turbopumps for cryogenic upper stage (CUS) engine development

Oct 1996 ISRO through LPSC, VSSC for Evaluation of Laternal and Torsional Critical speeds of the Rotors of main turbopump and booster turbopumps for cryogenic upper stage (CUS) engine devpt.

Oct 1996 ISRO through LPSC, VSSC for Estimation of Coolant Requirement and temperature of bearings of main turbopump and booster turbopumps for Cryogenic upper stage (CUS) engine development

Oct 1996 ISRO through LPSC,VSSC for Estimation of leakage through the labyrinth seals/ floating rings and the sealing system between fuel and oxidizer pumps of main turbopump for cryogenic upper stage (CUS)

Oct 1996 ISRO through LPSC, VSSC for Theoretical estimation of stiffness and load capacity of the bearings of main turbopump and booster turbopumps for cryogenic upper stage (CUS) engine development

Oct 1996 ISRO through LPSC, VSSC for Dynamic Characteristics of Sealing System, labyrinth seals/ floating rings and evaluation of overall damping characteristics of the main turbopump for cryogenic upper stage (CUS) engine development

Nov 1996 VSSC Trivandrum for "Thermal Analysis of Various Elements housed Inside GSLV L-40 Based Shroud and Thermal Boot

Nov 1996 GTZ, Germany for supply of spares for promotion of four Units

Dec 1996 BHEL, Hyderabad for "Devpt of design basis for 600oC steam turbines

Jan 1997 LPSC, Vallamala for a project on "Computational flow simulation of Gimballed Rocket Nozzles in Ejector- Diffusers for Cryogenic Upper State (CUS) Engine Devpt"

Jan 1997 VSSC Trivandrum for "An experimental Investigation of Heat Transfer on the GSLV Heat Shield & Satellite"

Jan 1997 FACT for "Devpt of Nylon Reaction Injection Moulding Process "

Feb 1997 ISRO for "Thermal Modelling of Cryogenic Rocket Turbo-Pumps"

Feb 1997 CECRI, India Lead Zink Information Centre & IIT for Investigations on the performance of galvanised reinforcements in tropical marine environment.

Feb 1997 Kirloskar Mcquay Pvt Ltd. for a project on "Compression heat Pump-Chiller"

March 1997 Tata Telecom Ltd for "ISDN Interface for paradigm Exchange project"

March 1997 Netlon India for "Investigation of the Strength and Stiffness of Geocell Reinforced Soft Foundation Soils"

March 1997 TIFAC of DST for a Composites Technology Centre at IIT Madras

4.19 Central Electronics Centre

4.19.1 New Courses Started:

- ◆ Thirteen Training Programme of one year was started on 6.1.97. Fifteen candidates joined the programme.
- ◆ One Training Programme of two weeks duration were conducted for System Designers in the area of Solar Photo Voltaics in collaboration with Siemens Solar, USA.
- ◆ One Three weeks Short Term Course on Electronics Instrumentation has been conducted for the staff members of CETE, Calcutta.
- ◆ One Intensive Refresher Course on Electronics Instrumentation has been conducted for Practising Service Engineers from Industries.

4.19.2 New Facilities added and major equipment procured:

- a) EMC Test Facility Rs.10.47 Lakhs

4.19.3 Major Consultancy Assignments:

S.No.	Title of Assignment	Organisation	No. of assignment	Amount	Co-ordinator
1.	Special function modules for CNC Machines	HAPP Min. of Defence, Trichy	28	5.465	Dr.M.Kumaravel
2.	PLC Modules/AC Drives	TAMIN, Madras	5	1.075	-do-
3.	CNC Machine Modules	HVF, Minf. of Defence, Madras	8	1.840	-do-
4.	Servicing Philips Multimeters	PS Electricals, Madras	1	0.084	-do-
5.	Transducer for Echo Trace Unit	Madras Port Trust	1	0.050	-do-
6.	Servicing of Test Rig	Jumbo Bag Ltd. Madras	2	0.024	-do-
7.	Readout System in Perlyar Dam	PWD Tamilnadu	1	0.010	-do-

4.19.4 Any other relevant details:

Under RBIC assignment scheme, a high speed portable electric drill with built-in inverter has been developed for Electrodynamic Industries Ltd., Madras.

4.19.5 Staff Strength:

The Centre has 10 Technical, 3 Administrative and 5 Project staff.

5. CENTRAL SERVICES

5.1 Central Library

The Central Library is well equipped and has modern facilities and services with rich resources in the form of CD-ROM, On-line databases, printed and non printed documents on Applied Sciences, Engineering, Technology and other new emerging areas. Some important facilities and services are given as under:

CD-ROM Literature Search Services

CD-ROM literature search service is now available on a Local Area Network (LAN) with 3 user terminals in First Floor Reading Hall (FFRH). The service is available from 9 a.m. to 8 p.m. on working days and 9.00 a.m. to 5 p.m. on Saturdays, Sundays and other holidays. The databases available are (COMPENDEX) PLUS and (INSPEC).

On-line Information Retrieval Service

Central Library also provides on-line information access to more than 400 databases including industrial databases through DIALOG Information Service. The service has been used by the members of Industrial Associate Scheme (IAS) besides IIT faculty, students and staff of the Institute.

Library Orientation

The Library has made necessary arrangements for providing continuous training to the users including industrial associates to familiarize themselves with search techniques using CD-ROM databases.

Library Automation

Central Library has automated Circulation Control which is working satisfactorily. A & P Module is in the operation for ordering new publications and printing catalogue cards. CDS/ISIS package is used to generate various in-house reports. Periodicals holdings have been automated. Databases on Ph.D theses submitted to IIT Madras, directory of e-mail addresses of Libraries and Information Centres in India and abroad, database of faculty publications and Annotated Guide to reference sources available at IIT Madras Library have also been created.

Staff Training

The following staff members were deputed for training programmes:

1. Working on INTERNET conducted by INSDOC, Madras Office during December 26-28, 1996.

Shri M. Murugan, Assistant Librarian

Shri C.R. Sekar, Asst. Librarian

Shri K. Sethu, Sr. Prof. Assistant

Mrs. Lalitha Rajendran, Sr. Prof. Assistant

Mrs. Sharada Raman, Sr. Prof. Assistant

2. Study of IIT-KLAS package at IIT Kanpur during September 17-20, 1996

Shri C.C. Tom, Asst. Librarian

□ Shri V. Bhasker Rao, Sr. Prof. Assistant

Shri P. Natarajan, Sr. Prof. Asst. (SG)

Shri S. Ramalingam, Junior Systems Engineer

Shri Baman Banavath, Asst. Systems Engineer, Computer Centre

3. Workshop on Common Communication Format conducted by Department of Library & Information Science, University of Madras during 15-16 February 1997.

Sri N. Gnanasekaran, Sr. Prof. Assistant

Sri K. Kamaraj, Sr. Prof. Assistant

New Services started

A weekly Tech News service based on six news papers (Business Line, The Hindu, Indian Express, Times of India, Economic Times, Hindustan Times) has been started. The service contains news, articles, press release covering the area of specialisation of IIT, Madras. Display of aculty Publications. Conference Alert Service.

Library and Information Services Statistics

The following statistics reflect the overall performance of the Library and Information Services during the year under report.

a. Membership

Institute Members	
Staff	1,223
Students	2,413
Alumni Members	46
Corporate Members	4
Industrial Associateship Members	226
Consultation Permits	1,700

b. Collection Development Acquisition of Publications

Books/Monographs	1,971
Theses	60
Pamphlets and Reports	80
Microfilms/Fische	76
Book-bank (General)	5
Book-bank (Weaker Section)	29
Current Periodicals by subscriptions	700
Current Periodicals by Exchange/Gift	82
Back volumes of periodicals	1,803
Total Accessions at the end of March 1997(Books & Journals)	3,774

c. Library and Information Services

Circulation	
Number of Readers visited	1,75,42
	7
Number of volumes Issued	1,36,72
	6
Number of volumes issued through Book Bank (General)	4,700
Number of volumes Issued through Book Bank (Weaker	3,200
Section)	
Overdue & other charges collected	Rs.2,22,072
Xerox charges collected	Rs.3,02,703

Reservation for Books	
Registered	3,745
Fulfilled	3,210
Loans	
Department Loan (under issue)	5,397
Permanent Loan Issued	760
Inter-Library Loans	
Borrowed from other Libraries	190
Loaned to other libraries	25
Literature Search	
CD-ROM searches by users	3,600
Reprint Service	
From International Sources, i.e., British Library,	75
Canadian Institute of Scientific Information, INSDOC, etc.	
Supply of reprints to other libraries	70
d. Audio-Visual Service	
Number of Audio Cassettes acquired	8
Number of Video Cassettes	9
Number of Video Programmes screened	100
Number of persons attended	500
e. Reprographic Service	
Number of Xerox copies supplied	815821
DTP output	6848
Number of copies printed on Rotaprinter	448300
f. Binding	
Number of Books and Journals bound (Internal)	15
	00
Number of Miscellaneous Publications bound (Internal)	60
	0
Number of books & Journals bound through external binders	26
	17
Departments works (Miscellaneous)	20
	00
g. Visitors to the Library	
Students from other Institutes (about 30 students per group)	8 groups
Other visitors	15 VIPs

Participation of Library Officers In Conferences/Workshops:

Dr. Harish Chandra, Librarian

1. Participated in the Aerospace Information Panel Meetig and also visited HAL, IISc. Library, NSIC, IIM, Bangalore, 17-18 July, 1996.

2. Attended Advisory Committee meeting of Anna University on 13-8-1996 regarding the computerisation of Library activities, Anamolies of pay scales of library staff and designation as special invitee.
3. Participated In the Indo-Japan Workshop on Information Technology held at SCRC, IISc., on 23-8-1996.
4. Attended Advisory Committee meeting at University of Madras for Research Scholars Examination in connection with Ph.D in Library and Information Science on 3-9-1996.
5. Attended 16th MALIBNET Governing body meeting on 6-9-1996, CSIR complex with Dean Academic Research.
6. Participated in the Workshop on strategic issues in IITM-Interface on 10-8-1996 and associated with the Human Resources group.
7. Attended Workshop on ISO-9000 orientation on 21-9-1996.
8. Attended the lecture of Prof. R. Natarajan, Director, IITM on building a partnership between business, labour and coordination to achieve Industrial maturity, Chief Guest: Shri M. Arunachalam, Hon'ble Union Minister of Labour.
9. Presented the activities of Central Library at the Heads of Department meeting in the presence of the Director on 17.9.1996.
10. Attended a talk on Electronic Information Access delivered by Ms. Miriam Rider, Information Specialist, USIS, Washington, D.C., Awareness Center Library, Madras Library Association on 23-9-1996.
11. Attended 15th Endowment Lecture of IIT Madras and Employers Federation of Southern India (EFSI), Hotel Savera, Madras. Lecture delivered by Dr. M.R. Srinivasan, Member Planning Commission, Presidential Remarks by Director, IIT Madras. Chief Guest Shri M. Arunachalam, Hon'ble Union Minister of Labour, Govt. of India on 3-10-1996.
12. Attended Sarada Ranganathan Endowment Lecture (1997) on Mapping Science & Building Science Indicators by Shri S. Arunachalam, Connemara Hotel, Chennai on 13-12-1996.
13. Participated in the presentation of Journal Database JSTOR by former U.S Ambassador Robert F.Gohen, IC & SR, IIT Madras on 21-2-1997.
14. Participated in the Worldnet dialogue on the role of the Library and Information professionals in the 21st Century, American Centre on 13-3-1997.
15. Attended special lecture on high performance computing by Dr. N. Balakrishnan, Chairman, Super Computer Education and Research Centre, IISc., Bangalore at Connemara Hotel, Chennai on 15-3-1997. Presided over by Shri C. Subramaniam, former Goernor of Maharashtra.

Participated in the Seminar on Library networking and resource sharing, American Centre, Madras 17-3-1997. Participated in the Workshop on Draft Report of Working Groups on 29-3-1997, CLT, IIT Madras.

Dr. R. Vengan, Deputy Librarian

1. Participated in the Workshop on 'Organisational Change Processes for Indian Institute of Technology, Madras 36', 24-26, June, 1996.
2. Served as a Member of the Board of Studies for PG Diploma in Library Automation (PGDLA) of Pondicherry University, 6-7-1996.

Shri M. Koteswara Rao, Deputy Librarian

1. Organised and implemented the conversion of Library Membership Numbers to Institute ID Nos. for all the Institute Faculty and Staff in January, 1997.
2. Attended the National Seminar on Geographic Information Systems for Development Planning, organised by RCIS & University of Madras on 12-2-1997.

3. Attended a Special Lecture on High Performance Supercomputing, by Dr. N. Balakrishnan, Chairman, Supercomputer Centre, IISc., Bangalore, organised by RCIS, Madras, on 15-3-1997.
4. Participated in the seminar on Library Networking and Resource Sharing, organised by USIS, Madras on 17-3-1997.
5. Participated in the Workshop on Strategic Management at IIT Madras on 29-3-1997.

5.2 Central Workshop

The various units of Central Workshop are Carpentry and Pattern Making, Fitter's and Tool Maker's Shop, Machine Shop, Gear Shop and Gear Testing, Instrument Shop, Electrical Shop, Foundry and Heat Treatment, Welding Shop, Automobile Repair, Design Cell and Stores. Some of the special facilities available are gear cutting, gear grinding and testing (spur and bevel gears), jig grinding, copy milling, manufacture of precision scales, precision instrument repairing, calibration of pressure gauges and dynamic balancing of rotors etc. Central Workshop undertook fabrication of components, gadgets, apparatus etc., required by the various Departments for research and development projects in addition to the regular training programme for the B.Tech students (700 students). For giving training in advanced machines like CNC machines, Central Workshop procured 3 CNC Lathes (Trainer) in the year 1992 and 1 CNC Milling machine in the year 1995.

An Advanced Workshop course was conducted during May-June 1996 for B.Tech students.
436 - Number of Work Orders were received during the period under report.

During the above period many works of Industrial Consultancy and Sponsored Research nature were undertaken and completed. In addition to the above, Institute buses and vehicles were maintained by Central Workshop.

5.3 Central Glass Blowing Section

The Central Glass Blowing Section (CGBS) is one of the important infrastructural facilities of the Institute since its inception in 1972. Being a central facility, this section is engaged in the design and fabrication of sophisticated scientific glass apparatus for research and development in the various departments. Besides, meeting the in-house needs, this section also frequently undertakes jobs for the industrial consultancy programme.

Number of work orders received and completed during April 96 - March 97	211 Nos.
Amount earned in terms of service charges during the above period	Rs.17,799/-

5.4 Central Photographic Section

This section with a staff strength of four experienced technical personnel caters to the photographic needs of various departments/centres of the Institute. It is involved in slide preparation and phototaking for research activities of the faculty members and research workers. It also undertakes development of rolls, enlarging and printing of black and white prints. It covers the different Institute functions such as Convocation, Sports-meet, Seminars, Symposia and helps various IC & SR activities. Around 600 work orders were executed during the year under report. In addition to this, a comprehensive photographic coverage of various departments/centres of the Institute was carried out during December/January for Open House held during Jan 13-16, 1997.

5.5 Central Gas Supplies Unit

The Central Gas Supplies Unit is administered by a Professor. The unit procures the following industrial gases and special gases from various manufacturers/suppliers and issues to various departments/laboratories of the Institute for research and practical classes.

Industrial gases: Oxygen, Nitrogen, Dissolved Acetylene, Argon and Hydrogen

Special gases: High purity Argon, High purity Oxygen, and High purity Nitrogen.

5.6 Centre for Continuing Education

The Centre for Continuing Education was established in June 1986, by merging different units connected with Continuing Education activities, Quality Improvement Programme and Curriculum Development Work and Educational Technology Cell at the Institute.

Quality Improvement Programme

Since inception 263 faculty members from other institutions have obtained Ph.D degrees and 344 faculty members have obtained M.Tech degrees under this Programme.

During 1996-97, 9 Ph.D Scholars and 14 M.Tech. students were admitted to the above programme. 16 Ph.D scholars and 19 M.Tech. students were on rolls during 1996-97.

Short Term Training Programme (STTP):

A Need Analysis Project to identify the Short Term Training Programme needs in the area of Civil, Chemical and Computer Science & Engineering for teachers of Engineering Colleges in Tamil Nadu, Andhra Pradesh and Pondicherry was carried out and reports submitted to the AICTE. The CCE at IIT, Madras is coordinating STT Programmes in the States of Tamil Nadu, Andhra Pradesh and Pondicherry starting from the year 1996-97.

Under STTP, 5 Summer/Winter Schools and under QIP-4 courses were conducted during 1996-97, mainly for teachers of Engineering Institutions, but also involving a few participants from industry.

Curriculum Development Programme

A more comprehensive overall Curriculum Development Cell has now been established in order to cater to the needs of all departments. During 1996-97, 3 proposals from faculty members for preparation of resource materials have been approved.

Continuing Education Programmes

A total of 33 Continuing Education Programmes were conducted and about 585 participants attended these programmes during 1996-97. Many industries are coming forward to make use of the expertise of IIT Madras faculty through these programmes.

Model Curriculum Development

AICTE has sanctioned Rs.5 lakhs for development of Model Curricula in Naval Architecture and Metallurgical Engineering at IIT, Madras and the work is in progress. Norms for Book Writing Scheme have been changed during the period under report to help and encourage the authors to write text books suitable for adoption not only in this Institute, but also in the other engineering colleges. Till now, 22 books have been published by reputed publishing companies and 9 more are under progress.

Educational Technology Cell

The Educational Technology Cell at IIT, Madras was established in 1987 with the principal objective of producing resource materials, mainly employing the media of video, audio-visual and computer assisted learning. A fully equipped studio has been set up for the production of these resource materials. Also a multi-media setup with 3D graphics/animation was installed and a video lesson production workshop was conducted for IIT Madras faculty members. To date, 25 video programmes have been completed, and a few more are in the pipeline.

6. STUDENT AMENITIES AND ACTIVITIES

6.1 Hostel

All students admitted to IIT Madras are required to reside in the hostels inside the campus. There are 11 men's hostel and 1 ladies hostel with a total of 2396 single rooms and 60 double seated accommodation. During the period under report, there were 1991 men and 245 women students in residence.

Each hostel is administered by a Warden and Assistant Warden. The Warden is assisted by a Hostel Council consisting of Student Secretaries and the Assistant Warden in day-to-day functioning of the hostel. The Hostel Management is a centrally administered body and is in overall charge of the functioning of all the Hostels and the Central Supplies Unit. There are 281 hostel employees and they are responsible to the Hostel Management through the respective Wardens of the hostels. The Chairman, Council of Wardens, is the Chairman of the Hostel Management. He is assisted by an Assistant Registrar and other supporting staff. During the period under report, the following officers were in position.

Chairman Council of Wardens and Hostel Management	Dr.B. Viswanathan Professor of Chemistry
Assistant Registrar	Sri K. Sekar
Name of the Hostel/Unit	Warden
Alakananda	Dr.R.P. Viswanath Asso. Professor of Chemistry
Brahmaputra	Dr. D.V.S. Murthy Professor of Chem. Engg.
Cauvery	Dr. S. Radhakrishna Professor of Applied Mechanics
C.S.U.	Dr.B. Viswanathan Professor of Chemistry
Ganga	Dr.Shrish Chaudhary Professor of Hum. & Soc. Sciences
Godavari	Dr. M.N. Sudheendra Rao Asso. Professor of Chemistry
Jamuna	Dr. K. Ramar Professor of Elec. Eng.
Krishna	Dr. S. Santhankumar Professor of Aerospace Eng.
Mandakini	Dr. U.S. Premananda Shet Professor of Mechanical Eng.
Narmada	Dr. T. Swaminathan Asso. Professor of Chem. Eng.

Saraswathi

Dr.P.C. Deshmukh
Professor of Physics

Sarayu

Dr. Nandita Das Gupta
Asst. Professor of Elec. Eng.

Tapti

Dr. R. Palaninathan
Professor of Applied Mechanics

6.2 Central Supplies Unit

The Central Supplies Unit is administered by a warden. It procures milk under the Milk Supply Scheme from the nearby villages and from Tamilnadu Co-operative Milk Producers' Federation Ltd. and distributes it to the student hostels, the residents of the campus and the staff of the Institute residing around the campus.

Under the Provision Supply Scheme, the unit procures the items of major consumption from the wholesale suppliers and distributes them to the hostels, thus economizing on the mess expenditure in the hostel messes.

6.3 Medical Facilities

Medical facilities are provided to the students in the well equipped Institute Hospital. Advice is given to the students on a wide range of health problems. The details of medical facilities available are given in Chapter 10 - Campus Amenities.

6.4 4 (TN) Air SQN (TECH) NCC

This Senior Division Airwing (Tech) NCC unit is functioning at IIT Madras from 16th September 1965. It provides NCC training exclusively to the students of the Institute. Regular Air Force Officers and Airmen as PI Staff are posted to this unit to impart the training. Unit strength is augmented by two Associate NCC Officers and other supporting civilian staff drawn from the Institute. NCC syllabus includes Drill, Civil Defence, Weapon Training, Leadership Course, Health and Hygiene, History of Indian Air Force, Principles of Flight, Radio/Radar Navigational Aids, Air Armaments, Avionics and Instrumentation.

Highlights of the Training for year 1996-97:

- Range firing practice on Revolver and 12 Bore gun.
- Blood donation camp organised at NCC Building through the Red Cross Society, Madras on 18th January 1997 in which 43 cadets donated blood.
- Eye donation pledge by 34 volunteer cadets and 3 family members.
- Under the social service activities, the cadets collected salvage items, like clothes, books, etc., within the IIT campus and the same were handed over to Indian Red Cross Society on 18th January 1997 for handing over to Andhra cyclone victims.

The NCC unit helps to a sense of discipline, comradeship, a spirit of adventure and quality of leadership in the mind of the NCC cadets of the Institute.

Commanding Officer : Wg.Cdr. RS Kumar
Associate NCC Officers : Fg. Offr. A Mani
Plt. Offr. S Neelamani

6.5 National Service Scheme (NSS)

6.6 Gymkhana

6.6.1 Sports Activities

Highlight:

After a gap of 8 years our boys contingent brought back the coveted General Championship at the XXXII Inter IIT Sports Meet held at IIT Delhi with overall points of 68 which was a cliff hanger till the penultimate day. On the final day our boys excelled in all the games/event, established a clear lead over our next closest competitor and finally emerged victorious.

6.6.2 Inter Collegiate Invitation Tournament:

The Institute Gymkhana organised the above Tournament from 6th September to 11th September 1996. This tournament provides an input for selecting our teams for All India Inter IIT Sports Meet which is an annual affair.

Our Hockey, Basket Ball, Foot Ball, and Tennis teams reached quarter finals. Our boys Badminton and Table Tennis teams won the runner up position.

6.6.3 I.I.T Sportstar Cricket Tournament:

Twenty two teams participated in the IIT Sportstar Inter Collegiate Cricket Tournament. Gurunanak College won the finals.

6.6.4 Inter IIT Aquatic Meet:

This meet was held from 30th September to 2nd October 1996 at I.I.T. Madras, since the host IIT (IIT Delhi) requested to conduct the meet at IIT Madras. Five IITs excluding IIT Guwahati participated in the above meet. IIT Madras was placed overall second.

6.6.5 Inter IIT Sports Meet:

The Inter IIT Sports Meet was held at Delhi from 14th to 19th December 1996. IIT Madras regained the coveted General Championship (GC) after a gap of eight years.

Our Volley Ball, Hockey, Weight lifting and Table Tennis teams won the gold medal. Our Basket Ball, Tennis, Swimming teams won the silver medal. Our Athletic squad, Foot Ball, Cricket and Water Polo teams won the third place. Our girls' Basket Ball team won the silver medal.

6.6.6 All India Basket Ball Tournament:

The above tournament was conducted from 16th to 20th January 1997. This tournament is conducted by inviting men and women teams from selected colleges from the city and out station. Sixteen teams took part in men's section and nine teams in women's section.

In the men's section, IIT Madras won against V.O.C. Tuticorin and gave a very tough fight to the PSG College of Arts and Science who beat the eventual winner, i.e., M.C.C. in the league encounters.

The concrete Basket Ball Court at OAT was declared open by Mr. N. Kumar, Vice President and Managing Director, Sanmar Electronics, on 16.1.97.

The IIT Chemplast Cricket Ground declared open on 22.2.97 by Mr. N. Shankar, Executive Vice Chairman, Chemplast-Sanmar.

6.6.7 Institute Open Bridge Tournament:

The Institute Open Bridge Tournament was conducted from March 21st to 23rd 1997 under the auspices of the Institute Gymkhana. Our students team and Faculty (Staff Club) team took part in the above tournament.

6.6.8 Inter Hostel Competition:

The Schroeter Trophy for General Championship was keenly contested by Jamuna and Ganga hostel boys. The eventual winner of the coveted trophy was Jamuna Hostel.

6.6.9 Swimming Pool:

Swimming Pool is functioning well, maintaining high standards. The Chennai District Meet and Tamilnadu State Meet were conducted at this swimming pool during the year under report.

The Swimming Pool Club is conducting Annual fortnightly "Learn to Swim" coaching classes for children of Madras city from April 15th onwards. About 500 children were benefitted by receiving coaching in our pool. There is a big demand for this swimming pool training.

Spectator, Inside Information is a very popular publication brought out by Gymkhana.

Fitness Club, Badminton Club, Tennis Club are functioning well.

Prof.N.Venkatrayulu's Ball Badminton Trophy tournament was conducted by the Staff Club of IIT Madras.

CULTURAL ACTIVITIES

6.6.10 Independence Day Celebrations:

This year's cultural activities took off with the Independence day celebrations. The Director of the Institute, Prof. R. Natarajan hoisted the National Tricolour. Patriotic songs on various languages were rendered by our students. Both faculty and students attended the function in large numbers.

6.6.11 Lit-Soc. Competitions:

The lit-soc competitions went through successfully this year and Narmada hostel topped the overall tally to bag the coveted lit-soc. trophy.

6.6.12 Bharat Utsav

The highlight during the odd semester was the Bharat Utsav '96 which was conducted from 4th to 7th October 96. For the first time colleges from within the city took part in the literary and arts competitions, viz., Elocution, Crossword, Debate, India Quiz, Collage, Patriotic/folk songs, Rangoli, etc. Lec. Dem. on 'Silambam' and 'Puppetry' by Madras Craft Foundation; Talk on 'Traditional and Modern Indian Architecture' by Smt. Sasikala Ananth of Economic Times and Times of India and 'Changing Cultural Profile of India' by Dr.A.S. Raman, former Editor, Illustrated Weekly of India; Vocal Carnatic Music concert by Sri Trichur V. Ramachandran and a Gaitar performance by Sri R. Prasanna featured in the Utsav. A special movie 'Bhagavad Gita' as part of the activities was screened. The crowning item was 'Ashtavadanam' by Dr. Garikapati Narasimha Rao, Director Garikapati Junior College, Kakinad. The performances were well received by the audience.

6.6.13 Teachers' Day:

Teachers day was celebrated on 5.9.96. For the first time the students gratefully acknowledged and cherished the meritorious guidance and teaching of their mentors. Mementos were presented to the faculty who retired in the Academic year 1995-96.

6.6.14 Engineer's Day:

Engineer's day was also celebrated on 15.9.96 wherein the stress was on the student-teacher interactions and technical competitions. As part of the technical competitions, a technical quiz and a technical paper presentations competition were held.

6.6.15 Saarang '97:

The premier cultural festival - Saarang '97 was conducted from 23rd to 28th of January 1997. Hectic but most enjoyable, perfectly organised and conducted like professionals, marked this year's activities. This was well appreciated by the participants (both outstation and local) faculty, campus residents and students.

As usual there was keen competition for honours in the numerary literary, fine arts and music competitions. The festival was taken to dizzy heights with a Hindustani classical concert by Ustad Amjad Ali Khan, Carnatic classical concert by Kadri Gopalnath, Western professional show by Juravi troupe and of course enthralling and captivating light music show by none other than Usha Uthup.

This year's festival was one of the best in the recent years.

6.7 Guidance and Counselling Unit

1. More faculty and student counsellors volunteered to work in the Unit during this year than the previous years. The unit currently has 40 faculty and 80 student counsellors.
2. A Campus Guide was prepared updating information in the form of a booklet and was made available to every fresh student of under-graduate programme.
3. The first year B.Tech students were distributed to various student counsellors and faculty counsellors for individual attention immediately on arrival on the campus. A deviation this year, was that the student counsellors were chosen such that they lived in the same hostels in which their counsellees also lived. This had the benefit of informal meetings of the students even during late hours, if help was needed.
4. A get-together of all the counsellors and the parents guardians was arranged to make the fresh students feel at home.
5. Student problems were solved then and there by the counsellors by paying individual attention to the needy.
6. The Unit could identify many academically weak students and could arrange for guidance through senior students who readily came forward to help in subjects like Mathematics, Physics, Chemistry and Engineering Drawing.
7. A few problems of emotional nature were also attended to by the unit with the help of the medical officers of the institute.
8. The unit helped the medical officers in blood grouping the first year students.
9. A lecture to students by Dr. Vijaya Kumar of SNEKA on stress Management was arranged by the unit and it was well received by the students.
10. The counsellors of the unit met five times this year to exchange views for efficient functioning.

6.8 Placement of Students:

During the year 1996-97, 601 students were placed, as detailed below:

Branch	No. of students registered for placement	Number for placed	SC/ST	Total	No. placed more than one job
(i)	(ii)**	(iii a)	(iii b)	(iv)	(v)
I. B.Tech					
1. Aerospace Eng.	19	12	-	12	2
2. Chemical Eng.	55	37	10	47	2
3. Civil Eng.	39	31	-	31	4
4. Computer Science	30	21	2	23	2
5. Electrical Eng.	74	59	1	60	3
6. Mechanical Eng.	82	71	6	77	8

Branch	No. of students registered for placement	Number for placed	SC/ST	Total	No. placed more than one job
(i)	(ii)**	(iii a)	(iii b)	(iv)	(v)
7. Metallurgical Eng.	29	22	-	22	2
8. Naval Architecture	19	13	-	13	1
Total	347	266	19	285	24
II. M.Tech.					
1. Aerospace Eng.	7	2	2	4	-
2. Applied Mechanics	8	5	-	5	-
3. Chemical Eng.	15	8	1	9	-
4. Civil Eng.	24	1	13	14	2
5. Computer Science	24	20	2	22	5
6. Electrical Eng.	20	15	3	18	1
7. Industrial Management	23	16	4	20	2
8. Mechanical Eng.	42	31	7	38	2
9. Metallurgical Eng.	12	7	-	7	-
10. Ocean Eng.	3	2	-	2	-
11 Solid State Tech.	3	2	-	2	-
Total II	18	109	32	141	12

** Though the total number of students indicated under column (ii) is 347, it is a fact that not all of them effectively utilised our placement services, as they developed different moorings. This explains the gap between columns (ii) & (iv).

Sl.No.	Branch	Numbers placed		
		Ph.D.	M.S.	M.Sc.
1.	Aerospace Engineering	1	4	-
2.	Applied Mechanics	5	8	-
3.	Chemical Engineering	1	3	-
4.	Chemistry	1	-	1
5.	Civil Engineering	3	4	-
6.	Computer Science	-	13	-
7.	Electrical Engineering	1	9	-
8.	Industrial Management	-	4	-
9.	Mathematics	5	-	8

Sl.No.	Branch	Numbers placed		
		Ph.D.	M.S.	M.Sc.
10.	Mechanical Engineering	3	16	
11.	Ocean Engineering	-	4	-
12.	Metallurgical Engineering	-	1	-
13.	Physics	4	-	4
	Total	24	66	13

7. FINANCIAL ASSISTANCE TO STUDENTS

Financial Assistance in the form of Scholarships and Fellowships is extended to meritorious students who are pursuing Engineering, Technology and Science education at this Institute. The details of Scholarships and Fellowships sanctioned to the students of different programmes during 1996-97 are as follows:

7.1 B.Tech.

Merit-cum-means scholarships of Rs.300/- p.m. were sanctioned to the students admitted to the B.Tech. programme besides the exemption from payment of tuition fees. During the period under report 34 students benefitted. The year-wise details of such students are given in Table 7.1.

SC/ST students admitted to the B.Tech. programme upto the academic year 1996-97 were sanctioned the concession of free messing plus Rs.70/- p.m. out of pocket expenses, exemption from payment of tuition fees and hostel seat rent as per Govt. of India post-matric scholarship rules. As on 31.3.97, 21 students have benefitted. The year-wise details of such students are also given in Table 7.1.

Table 7.1

Year of the B.Tech Programme	Meri-cum-means Scholarship	Free messing (basic menu) and pocket allowance concession to SC/ST students
1	7	4
2	7	2
3	8	7
4	12	7
Total	34	21

In addition to the above, the Institute sanctioned a notional prize of Rs.100/- to the top ranking (in the JEE) 27 first B.Tech. students.

7.2 M.Tech.

Students who joined the M.Tech. programme through GATE were awarded Half-time Assistantship (HTA) at Rs.1800/- per month. During the period under report 195 fresh assistantships and 175 renewed assistantships were given. The department-wise details are given below:

Table - 7.2

No. of M.Tech. assistantships awarded

Sl.No.	Discipline	Fresh	Renewal
1.	Aerospace Engineering	5	6
2.	Applied Mechanics	6	7
3.	Chemical Engineering	20	14
4.	Civil Engineering	29	24
5.	Computer Science and Eng.	15	25
6.	Electrical Engineering	28	17
7.	Industrial Management	16	22
8.	Mechanical Engineering	58	42

9.	Metallurgical Engineering	11	12
10.	Ocean Engineering Centre	5	3
11.	Solid State Technology	2	3
	Total	195	175

7.3 M.Sc.

Students admitted to the M.Sc. programme were sanctioned Rs.300/-p.m. merit scholarship. Exemption from payment of tuition fee was also given to certain students. During the period under report 40 students benefitted. The department-wise details of such awards are given below:

Table 7.3

Course	Year	No. of merit scholarships awarded	No. of freeships (tuition fees waiver) granted
Chemistry	I	6	2
	II	10	3
Mathematics	I	8	2
	II	6	2
Physics	I	5	3
	II	5	2
	Total	40	14

7.4 M.S.

The scholars admitted to the M.S. programme through GATE or equivalent examinations are given Half-time Teaching Research Assistantship (HTRAs) of Rs.2500/- p.m. for three years. During the period under report 200 scholars received this assistantship of whom 60 were fresh scholars. The department-wise details of the assistantships awarded and renewed are given below:

Table 7.4

Number of M.S.Scholarships awarded

Sl.No.	Department	Fresh	Renewal
1.	Aerospace Engineering	2	9
2.	Applied Mechanics	8	13
3.	Chemical Engineering	6	10
4.	Civil Engineering	7	11
5.	Computer Science & Eng.	9	25
6.	Electrical Engineering	9	29
7.	Humanities & Social Sciences	5	5
8.	Mechanical Engineering	8	28
9.	Metallurgical Engineering	1	5
10.	Ocean Engineering	5	5
	Total	60	140

7.5 Ph.D.

The scholars admitted to the Ph.D full time programme in Engineering are sanctioned Half time Teaching/Research Assistantship (HTRA) of Rs.3000/- per month. Scholars admitted to the Ph.D fulltime programme in the Science subjects are sanctioned Rs.2500/- p.m. During the period under report 180 students obtained assistantships of whom 36 were fresh scholars. The department-wise details of the assistantships awarded and renewed are given below:

Table - 7.5
Number of Ph.D. HTRA awarded

Sl.No.	Department	Fresh	Renwal
1.	Aerospace Engineering	1	7
2.	Applied Mechanicals	2	16
3.	Chemical Engineering	5	23
4.	Chemistry	12	48
5.	Civil Engineering	3	12
6.	Computer Science & Engineering	-	4
7.	Electrical Engineering	2	2
8.	Humanities & Social Sciences	1	8
9.	Mathematics	3	6
10.	Mechanical Engineering	6	22
11.	Metallurgical Engineering	-	11
12.	Ocean Engineering	-	9
13.	Physics	1	12
	Total	35	180

8. WEAKER SECTION AND FOREIGN STUDENTS

8.1 B.Tech:

As per the GOI orders 22.5% of the seats are reserved for SC and ST students in the B.Tech. programme. These students are admitted through the Joint Entrance Examination with a relaxation: These students have to get only 60% of the marks obtained by the last student of the general category to get qualified for admission. 35 SC/ST students joined the B.Tech programme during the academic year 1996-97. During counselling prior to admission, the Adviser explained to each student the requirements of different branches. This helped the students in choosing a suitable branch based upon the capability and interest of each student. When a student finds the chosen branch is tough, he is allowed to switch over to lower JEE cut-off branch.

Students admitted against reservation are given the following benefits:

- * Travelling allowance (IInd Class train fare/ordinary bus fare) from the place of residence to Madras to join the B.Tech. programme.
- * Free tuition.
- * Free lodging and messing (basic menu) and pocket allowance of Rs.70/- p.m. provided their parents' income is Rs.24000/- net per annum or less (as per Government of India revised order).
- * A Book Bank as part of Central Library is maintained for the benefit of the SC/ST students. The students are issued 12 tickets for taking books from the Book Bank. Books are issued for a semester.
- * Drawing instrument (Mini-drafter) free of cost.
- * 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.

8.2 Preparatory Course for B.Tech.

A preparatory course of one academic year was initiated by the Ministry of Human Resource Development, Government of India, during the year 1983-84 exclusively for SC/ST students. Selection for this course is made from the SC/ST students' Joint Entrance Examination list who did not get admission through the Joint Entrance Examination. After successfully completing the preparatory course at the IIT, they would be eligible to join the B.Tech programme and they were not required to write the JEE again. This Institute conducted preparatory course during 1996-97. 37 students joined and out of them 1 discontinued.

8.3 M.Tech./M.Sc.

22.5% of the seats are reserved for the students of SC and ST communities as per the Government of India orders. They are admitted through GATE with a relaxation. These students have to get only 60% of the GATE percentile obtained by the last student in the general category. 49 SC/ST students were admitted to the M.Tech programme during the academic year 1996-97.

Admission was made for the M.Sc. programme through entrance examinations only.

Students admitted against reservation are given following benefits:

- * Book Bank facility is given 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 this category of students.
- * Scholarship is given to all the students.

8.4 Foreign Students

During the academic year 1996-97, 21 self-financing foreign students joined the B.Tech programme from the following countries:

Kenya	:	1
Sri Lanka	:	4
USA	:	1
NRI	:	15

Foreign students are also permitted to use the Book Bank. 4 Book Bank library tickets are issued to each student. Books are issued for a semester.

9. FINANCE AND ACCOUNTS

The financial year of the Institute corresponds with that of Government of India i.e. 1st April to 31st March of the following year. The accounts of the Institute are annually audited by the Accountant General, Tamil Nadu & Pondicherry, Madras on behalf of the Comptroller and Auditor General of India.

The Finance Committee of the Institute in its meeting held on 17.12.96 recommended the Non-plan revised estimates 1996-97 (Gross) for Rs.3762.20 lakhs and the Budget Estimates 1997-98, Rs.3721.72 lakhs. The committee also recommended the Plan Revised Estimates and Budget Estimates of Rs.426 and 725.40 lakhs respectively for 1996-97 and 1997-98 subject to review at a later date.

The following are the details of financial estimates for 1996-97 and 1997-78:

	Rs. in Lakhs		
Head	Budget Estimates for 1996-97 (as proposed and allocated by Board of Governors)	Revised Estimates 1996- 97 as per Board of Governor's approval	Budget Estimates 1997-98 (as proposed)
I Non-Plan:			
<u>Expenditure</u>			
1. Recurring	3279.95	4161.95	4229.50
2. Non-Recurring	--	175.00	50.00
Total	3279.95	4336.95	4279.50
<u>Income</u>			
Income Generated	418.70	537.15	557.78
Opening Balance as on 1.4.96	--	(-) 254.42	--
Grant demanded from MHRD	2861.25	4054.22	3721.72
Total	3279.25	4336.95	4279.50
II Plan:			
<u>Expenditure</u>			
Opening Balance fully committed	207.08	207.08	
Recurring	25.00	25.00	20.00
Non Recurring	295.00	401.00	705.40
Total	527.08	633.08	725.40
<u>Income</u>			
Grant demanded from MHRD	320.00	426.00	725.40
Opening Balance	207.08	207.08	
Total	527.08	#633.08	725.40

* carry over from 1995-96 account

Includes carry over of Rs.207.08 lakhs representing Irrevocable commitment of 1995-96

Audit

The accounts of the Institute for the year 1995-96 was audited by the Accountant General between April 1996 to June 1996. The audited report (both English and Hindi versions) on the accounts of the Institute for the year 1995-96 was sent to the Ministry of Human Resource Development, GOI for placing the same on the table of the parliament.

The salient features of the 1995-96 accounts are given below:

Sl.No.	Item	Rs. in Lakhs
I. Receipt :		
1.	Opening Balance	1795.84
2.	Grant from GOI	2649.60
3.	Institute Receipt:	
	Fees, etc	72.91
	Application Fees	123.37
	Income from Vehicles	8.28
	Income from Buildings	36.36
	Other receipts	280.19
4.	Recovery of Advances	56.66
5.	Deposits	2451.67
	Total	7474.88
II. Payments :		
a. Capital Account		
1.	Buildings and Constructions	138.74
2.	Furniture equipment and fittings	67.51
	Research Centres & Central Services	96.43
3.	Library Books and Journals	103.93
4.	Others	4.04
	Total (a)	410.65
b. Revenue Account:		
1.	Academic Departments/Centres:	
	Pay & Allowances of Tech. Staff	598.14
	Pay & Allowances of Non-Teaching Staff	324.78
	Department running expenses	53.99
	Library staff salary and running expenses	48.53
	Central Workshop staff salary and running expenses	71.52
	Indo-German Projects including Pay & Allowances	2.70
	Research Centres Pay & Allowances including CEC & AC Unit running expenses	58.08
	Centres; Central Services working expenses	40.49
	Rural Development Research Activities	1.24
	Institute Scholarship/HTTA	198.89
	Other Items	76.33
	NCC; NSS and NSO: Pay & allowances & running expenses	4.44
	Total (b-1)	1479.33

2. Central Administration:		
Pay & Allowances		241.53
Hostel		95.56
Stores Pay & Allowances		13.56
Security & Fire fighting		4.96
Lawns & Garden		1.24
Service & Maintenance		245.14
(Telephone, Power, Water, Furniture repair & Maintenance, Oil, Petrol, etc.)		
Dispensary including staff salary		32.21
Atheletics and Gymkhana		14.93
Vanavani Matriculation Hr. Sec. School		2.75
Amenities		0.29
SC/ST Special coaching/Preparatory course		0.05
Guidance and Counselling		0.01
DDF		0.04
	Total (B-2)	652.27
3. Works & Maintenance :		241.35
Pay & allowances and other expenses		
4. General Expenses :		
Postage; Liveries; Stationery; Printing; etc.		34.07
TA of authorities & Institutes selection Committees members, Candidates called for interview		13.93
Reimbursement of stamp duty, sundries; etc.		8.47
PF/Gratuity/Pension		437.79
Advances paid		49.77
Deposits refunded		1916.71
Investment of corpus fund		173.00
	Total (4)	2633.74
	Total a + b	5417.34
5. Closing Balance :		2057.54
	Total	7474.88

10. CAMPUS AMENITIES

10.1 Engineering Unit

Construction Work:

The Engineering Unit of this Institute is responsible for the construction of new buildings and the maintenance of the campus.

The following major works were completed during the year 1996-97.

S.No.	Name of Work	Rs. in Lakhs
1.	Construction of E1 type quarters	31.50
2.	Construction of second floor over western wing of Vanavani School	6.52
3.	Construction of Canara Bank annexe at shopping centre	4.57
4.	Construction of second floor over common room of Ganga, Jamuna and Mandakini Hostels	22.00
5.	Construction of Mezzanine floor for Technology Development Mission Project at FRP centre	4.00
6.	Providing concrete platform for car parking facilities near main gate	1.32
7.	Construction of extension for telecommunication office	1.90
Total		71.81

10.2 Housing Facilities

As on 31.3.197, there were 932 quarters in the campus. In addition to this there were 140 servant quarters also in the campus. In the year 1996-97, another 12 E₁ quarters are under construction.

10.3 Telephone Facilities

A telephone exchange with 128 P & T lines are functioning. It supports 1350 lines. Telephone facility had been given upto Asst. Professor level in the department and upto Associate Professor level in the quarters.

10.4 Guest House

There are two Guest Houses in the Campus viz. the Main Guest House and Taramani Guest House which have six suites and 30 rooms respectively. In the year 1997-98, a sum of Rs.26.25 lakhs was the receipt for boarding and lodging.

10.5 Hospital

The Institute Hospital consisting of 36 beds, extends medical facilities to students, staff members and their dependents. The hospital offers out-patient and in-patient services for medical, surgical, obstetric, gynecological, pediatric, ENT and ophthalmic treatments.

The following are the Officers in the Hospital:

Dr. A. Ganesan, M.D.	Chief Medical Officer (on leave)
Dr. N.A. Jayavelan, MBBS,(MD)	Chief Medical Officer I/C
Dr. Lalithakumari, MBBS, DGO	Lady Medical Officer
Dr. C.Sridevi, MD, D.CH, M.Sc.	Medical Officer-Paediatrician
Dr. S.Aruna, MBBS	Medical Officer
Dr. A. Mahalakshmi, MBBS	Medical Officer
Dr. Arunkumar, MBBS	Junior Medical Officer
Dr. A. Selvam, MBBS	Junior Medical Officer

Part-Time Consultants

Dr. S.Kameswaran, MS, PhD, FRCS(ED), FRCS(GL), FRCS(DLO), DSc.	ENT Surgeon
Dr. S.Devaji Rao, MS, MNAMS, FICS	General Surgeon
Dr. S.Rathanamala, MBBS, DO	Ophthalmologist
Dr. R.Rajkumar, MD, DPM	Psychiatrist

Pramedical Staff

Lay Secretary	:	1
Staff Nurses	:	9
Pharmacists	:	4
Lab. Technicians	:	2
Male & Female Helpers	:	10
Others	:	13

Patient Service:

O.P. card registration system was computerised. In 1996-97 about 68,000 patients were treated as outpatients and 875 were treated as inpatients.

Emergency Service:

Hospital service is available round the clock all the 24 hours of the day with a duty doctor and supportive staff. 2775 emergency cases were attended during non-OP hours. About 500 cases had been referred to outside hospital due to lack of treatment facilities at our hospital. An ambulance service is available on call.

Clinical Laboratory Service:

Well equipped clinical laboratory services are available with two laboratory technicians. In 1996-97 about 14,330 clinical lab. tests were conducted. About 4,800 biochemical tests (blood sugar and urea) were done. A modern computerized ECG recorder was acquired and the facility is available round the clock. 1100 ECGs were recorded during 1996-97.

Operation Theatre:

A well equipped operation theatre is available with sophisticated operating microscopes, endoscope, instruments for IOL surgery, cardiac monitor etc., along with regular equipment. In 1996-97 83 general and 175 minor surgeries, 41 ENT and 23 Eye surgeries (including 11 Intra-Ocular-Lens operations) were done at our hospital. An uninterrupted power supply to the Operation Theatre during surgery with a standby battery operated UPS and a diesel operated 5 KVA power generator are available.

Immunization Programme:

Parents of young children are educated on the proper immunization schedule. The complete immunization is given at our hospital for all the children. All vaccines are stored properly in the refrigerator as per the norms.

Treatment for Nonentitled:

Nonentitled guests of a staff member when accompanied by the staff member or his authorized dependent, can avail emergency treatment on payment basis subject to the Institute rules.

Stores and Dispensary:

A medical cum surgical stores manned by a qualified pharmacist is available. All activities, enquiry, comparative statement, indenting, issues, etc., are computerized. It had dealt with the purchase worth more than Rs.10 Lakhs in 1996-97. All the drugs purchased at our hospital are decided by the hospital drug committee. To ensure that the drugs are of superior quality, quotations are called for from the recognized drug companies only.

Other Activities at Hospital:**Health Education Programme:**

To create awareness and educate public on preventive medicine, regular health education programs were conducted on diabetes, acupressure and heart attack during 1996-97. A diabetes detection camp was conducted with the help of Lions Club of East Chennai and 317 persons attended the camp in February 1997. 7 fresh cases of diabetes were detected. First Aid training program was organized with the help of Red Cross Society and 29 staff members were trained and certificates were issued to them.

Continuing Medical Education (CME) Program for Doctors:

Monthly CME program are being conducted regularly to update our medical knowledge. Experts from different fields of medicine and surgery deliver special lectures followed by discussion. In 1996-97, 11 such CME programs were conducted.

In-House Training Program for Para Medical Staff:

3 training programs for staff nurses and other paramedical staff were conducted at the hospital during 1996-97. Regular meetings of all hospital staff were conducted and discussed the issues of the hospital to improve the service.

Hospital Office:

Apart from dealing with the administration of the hospital, the office staff processes medical reimbursement claims. It had dealt with the processing of more than Rs.14.5 lakhs by way of reimbursement in the year 1996-97.

Research and Project Activities;

Medical Officers coordinate with faculty members for some of the research and project activities of the Institute.

10.6 Bank

State Bank of India IIT Branch is functioning on the campus. An extension counter of Canara Bank is also functioning on the campus.

10.7 Post Office

There is a post office on the campus opposite to the State Bank of India to cater to the needs of the staff, students and residents of the campus.

10.8 Schools

Vanavani Matriculation Higher Secondary School (V.V.M.H.S.S.) administered by IIT Employees' Educational Society is functioning on the campus besides a Kendriya Vidyalaya (K.V.). VVMHSS school is offering courses from L.K.G. to XII Standards and the K.V. is offering courses from I standard to XII standard.

10.9 Open Air Theatre

An Open-Air Theatre is available for screening films by the Film Club during week ends and for use for other functions of the Institute and the Schools.

10.10 Student Activities Centre

This building is used for indoor games of the students as well as for the conduct of important functions such as the Convocation etc.

10.11 Cafeteria

Two Canteens, viz. IIT Staff Canteen and RPG Restaurant are available on the campus to cater to the needs of the staff and students. Transport facilities are also available for the official work.

10.12 Transport Services

The Institute has buses which provide transport facility within the campus to the staff, students and residents of the campus.

10.13 Campus News

The Campus News is published every Friday highlighting the important events of the Institute.

LIST OF MEMBERS OF COUNCIL OF IITS

	Name of the Representing Organisation	Name and Address	
1.	The Minister in charge of Technical Education in the Central Government Ex-officio	Shri S R Bommal Minister of Human Resource Development New Delhi	Chairman
2.	Chairman of each Institute (Ex-officio)		
	i. Kharagpur	Shri R P Goenka Chairman, Board of Governors IIT Kharagpur	Member
	ii. Bombay	Dr. R Chidambaram Chairman Board of Governors IIT Bombay	Member
	iii. Madras	Prof. U R Rao Chairman Board of Governors IIT Madras	Member
	iv. Kanpur	Shri G H Singhanian Chairman Board of Governors IIT Kanpur	Member
	v. Delhi	Dr. P J Kurien Chairman Board of Governors IIT Delhi	Member
	vi. Guwahati	H.E. Shri Lok Nath Mishra Chairman Board of Governors IIT Guwahati	Member
3.	Director of each Institute (Ex-officio)		
	i. Kharagpur	Prof. Amitabha Ghosh Director IIT, Kharagpur 721302	Member
	ii. Bombay	Prof. S P Sukhatame Director IIT, Bombay 400 076	Member
	iii. Madras	Prof. R Natarajan Director IIT, Madras 600036	Member
	iv. Kanpur	Prof. R C Malhotra Director IIT, Kanpur 208 016	Member
	v. Delhi	Prof. V S Raju Director IIT, New Delhi 110016	Member
	vi. Guwahati	Prof. D N Buragohain Director IIT, Guwahati 781 001	Member

	Name of the Representing Organisation	Name and Address	
4.	Chairman University Grants Commission (Ex-officio)	Prof. Armaitey Deasi University Grants Commission, Bahadur Shah Zafar Marg New Delhi 110 002	Member
5.	Director-General Council of Scientific & Industrial Research (Ex-officio)	Dr. R A Mashekar Director-General, CSIR Rafi Marg, New Delhi 110 001	Member
6.	Chairman Indian Institute of Science Bangalore (Ex-officio)	Dr. Raja Ramanna Chairman, Indian Institute of Science, Bangalore 560 012	Member
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