



# TWENTY SECOND ANNUAL REPORT

*INDIAN INSTITUTE OF TECHNOLOGY MADRAS*  
**1980 - 81**



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Indian Institute of Science  
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Ministry of Education and Culture  
New Delhi

Sri J. A. Kalyana Krishnan  
Financial Adviser  
Ministry of Education and Culture  
New Delhi

Dr. M. S. Swaminathan  
Member  
Planning Commission, New Delhi

*Members of Parliament*

*(Two from Lok Sabha and one from Rajya Sabha)*

Dr. Subramaniam Swamy

Prof. Ajit Kumar Mehta

Shri Ladli Mohan Nigam

*Representatives of the All India Council for Technical Education*

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Secretary, Ministry of Education and  
Culture, New Delhi

*Nominees of the Visitor*

Dr. M. Santappa

Sri Prakash Tandon

Prof. B. Nag

Sri B. Ramachandra

Sarosh J. Ghandy

*Secretary*

Dr. K. Gopalan  
Deputy Educational Adviser (Tech.)  
Ministry of Education & Culture  
New Delhi

## The Board of Governors

### *Chairman*

Sri A.M.M. Arunachalam,  
(up to 27-2-81)  
Chairman and Managing Director,  
Tube Investments of India Limited,  
11/12, Rajaji Road, Madras-600 001

Sri A. Sivasailam [From 28-2-81]  
Chairman,  
Amalgamations Limited,  
Madras-600 002

### *Nominees of the State Governments*

Sri Noor Ahmed,  
Director of Technical Education,  
Government of Karnataka, Bangalore

Sri S. Vaiyapuri,  
Director of Technical Education,  
Government of Tamil Nadu, Madras

Dr. S. Vasudev,  
Director of Technical Education  
Government of Kerala, Trivandrum

Prof. T. R. Doss,  
Former Vice-Chancellor,  
J. N. Technological University,  
Hyderabad

### *Nominees of the Council*

Sri P. Sivalingam,  
Vice-Chancellor,  
Perarignar Anna University of  
Technology,  
Madras-600 025

Sri J. J. Mehta,  
Chairman and Managing Director,  
Polymers Corporation of  
Gujarat Limited,  
Giriraj Apartments,  
Race Course Circle,  
Opp. GEB Office, Baroda-390 007

Sri R. Aravamudan,  
Director,  
Systems Reliability Group,  
Vikram Sarabhai Space Centre,  
Trivandrum-695 022

Sri A. K. Khader Kutty,  
Chairman & Managing Director,  
Western Plywood Co. Ltd.  
Cannanore

### *Nominees of the Senate*

Dr. M. C. Gupta  
Professor Dept. of Mech. Engg.  
I. I. T. Madras

Dr. V. Srinivasan,  
Professor,  
Dept. of Chemistry,  
I. I. T. Madras

*Director*

Prof. P. V. Indiresan,  
I. I. T., Madras

*Secretary*

Sri R. S. Virmani,  
Registrar,  
I. I. T. Madras

**The Finance Committee**

*Chairman*

Sri A.M.M. Arunachalam,  
Chairman and Managing Director,  
Tube Investments of India Limited,  
11/12, Rajaji Road, Madras  
(up to 27-2-81)

Sri A. Sivasailam [From 28-2-81]  
Chairman,  
Amalgamations Limited,  
Madras-600 002

*Members*

Dr. K. Gopalan  
Deputy Educational Adviser (Tech)  
Ministry of Education and Culture,  
Government of India,  
New Delhi

Sri J. A. Kalyana Krishnan,  
Financial Adviser,  
Internal Finance Division,  
Government of India,  
New Delhi

Prof. T. R. Doss,  
Former Vice-Chancellor,  
J. N. Technological University  
Hyderabad

Sri P. Sivalingam,  
Vice Chancellor,  
Perarignar Anna University of  
Technology, Madras

Prof. P. V. Indiresan,  
Director, I.I.T. Madras

*Secretary*

Sri R. S. Virmani,  
Registrar,  
I. I. T. Madras



## The Buildings and Works Committee

### *Chairman*

Sri A.M.M. Arunachalam,  
Chairman and Managing Director,  
Tube Investments of India Limited,  
11/12, Rajaji Road, Madras  
[up to 27-2-81]

Sri A. Sivasailam [From 28-2-81]  
Chairman,  
Amalgamations Limited,  
Madras-600 002

### *Members*

Prof. P. V. Indiresan,  
Director,  
I. I. T. Madras

Sri L. Karunakaran,  
Superintending Engineer,  
C. P. W. D. Madras

Prof. L. N. Ramamurthi,  
Chairman,  
Estate and Works Committee,  
I. I. T. Madras

Sri B. A. Jayabalan,  
Chief Engineer,  
P. W. D. Madras

Sri Y. S. Nagaraja Rao,  
Executive Engineer,  
I. I. T. Madras

### *Secretary*

Sri R. S. Virmani,  
Registrar,  
I. I. T. Madras

## The Senate

### *Chairman :*

P. V. Indiresan

### *Members :*

M. K. Achuthan  
R. S. Alwar  
V. Anantaraman  
K. Anantha Padmanabhan  
G. Aravamudan  
B. V. Aswathanarayana Rao  
V. Balakrishnan  
K. Balaraman  
C. S. Ballal  
D. K. Banerjee  
K. A. Bhaskaran  
T. K. Bose  
H. Chandrasekharan  
N. V. Chandrasekhara Swamy  
K. A. Damodaran  
K. M. Das  
C. Ganapathy Chettiar  
T. P. Ganesan  
K. V. Gopalakrishnan  
T. Gopichand  
M. C. Gupta  
R. K. Gupta  
S. Jambunathan  
D. Johnson Victor  
D. Kakati  
C. Kalidas  
R. Kalyanakrishnan

Klaus Schleusener  
C. S. Krishnamoorthy  
M. V. Krishnamurthy  
V. M. Krishnasastry  
P. R. Krishnaswamy  
A. Kuppurajulu  
J. C. Kuriacose  
K. Lakshminarayana  
H. N. Mahabala  
P. T. Manoharan  
H. Md. Roshan  
B. S. Murthy  
V. G. K. Murti  
Y. V. G. S. Murti  
C. R. Muthukrishnan  
R. Nagarajan  
M. S. Narasimhan  
Y. Narayana Rao  
R. Natarajan  
V. S. Nazir Ahmed  
S. D. Nigam  
K. A. V. Pandalai  
M. A. Parameswaran  
K. R. Parthasarathy  
H. S. Paul  
C. N. Pillai  
D. Prithviraj

H. C. Radhakrishna  
S. Radhakrishna  
R. Radhakrishnan  
V. Radhakrishnan  
K. Radhakrishna Rao  
J. P. Raina  
N. Rajagopalan  
N. R. Rajappa  
K. P. Rajappan  
V. S. Raju  
E. G. Ramachandran  
S. R. Ramadas  
V. Ramakrishnan  
L. N. Ramamurthy  
V. Ramamurti  
H. Raman  
B. V. Ramanamoorthy  
S. Ramani  
M. Ramanujam  
C. Ramasastry  
B. Ramaswami  
G. V. N. Rayudu  
K. S. Sankaran  
L. V. K. V. Sarma  
V. V. Sastry  
M. Satyanarayana  
K. N. Seetharamu

V. Seshadri  
R. S. Sirohi  
J. Sobhanadri  
A. K. Sreekanth  
P. S. Srinivasan  
R. Srinivasan  
R. S. Srinivasan  
S. K. Srinivasan  
T. M. Srinivasan  
V. Srinivasan  
K. Srinivasaraghavan  
P. Srinivasa Rao  
M. S. Subrahmanyam  
S. Subramaniam  
N. Subramanian  
R. Subramanian  
Surjit Singh  
K. Thulasiraman  
Y. B. G. Varma  
R. Vasudevan  
M. A. Veluswami  
P. Venkata Rao  
V. C. Venkatesh  
D. Venkateswarlu  
M. Venugopal  
B. Yegnanarayanan

*Senior Warden :*

Mrs. Maha Seshasayee

*The educationists from outside the Institute nominated by the Chairman,  
Board of Governors :*

G. S. Laddha

M. Santappa

C. T. Kurian

*Members of the Faculty (Nominee)*

R. L. Roychowdhury

*Members of the Faculty (Invitees)*

V. M. Radhakrishnan

K. Remananda Rao

V. Sivaramakrishnan

G. Subramanian

*Secretary :*

R. S. Virmani, Registrar

# REPORT BY THE DIRECTOR

APRIL 1, 1980 TO MARCH 31, 1981

The following pages give a brief account of the activities of the Institute during the year 1980-81.

## **Student Strength**

The parity achieved between undergraduate students and postgraduate students continued to be maintained during the year under report. There were 1231 undergraduate students and 1241 postgraduate students.

## **Convocation**

At the last Convocation held on 22nd August 1980, 214 students obtained the B. Tech Degree, 41 the M.Sc Degree, 220 the M. Tech Degree, 10 the DIIT, 44 the MS Degree and 52 the Ph.D Degree. Of the 52 Ph.D Degrees conferred, 27 were in Engineering disciplines. Also, the honorary Degree of Doctor of Technology was conferred on Dr. A. Ramachandran, Executive Director, UN Centre for Human Settlement (HABITAT), Nairobi, Kenya.

## **Staff**

During the past year, 125 people have joined the services of the Institute, 71 were promoted and 31 resigned/retired. All the 445 workcharged employees, who have been at the Institute for more than a decade, have now been brought on to the permanent cadre of the Institute. We have also, on par with the practice obtaining in the other IITs, reduced the period for the Review Promotion Scheme for the supporting staff from 10 years to 8 years.

## **Conferences**

We organized several International conferences among which may be mentioned the First National Conference on Ocean Engineering and International Symposium on Pollution Performance of Insulators and Surge Diverters.

## **Assistance to foreign University**

This year we introduced a unique programme of co-operation and assistance to the Peradeniya University in Sri Lanka. Under this scheme, 16 faculty members in four batches of four persons each have been deputed to assist the University of Peradeniya in their academic activity. This has received high appreciation from the Sri Lankan authorities and thereby we have in a small way contributed to raising the image of our country in Sri Lanka.

## **Extramural lectures**

A most important innovation this year was the introduction of extramural lectures. 35 of these were delivered by luminaries in various fields of arts, science, economics and other fields. These proved immensely popular with students and staff.

## **Co-operation with Industry in academic activities**

We have introduced several schemes for closer co-operation with industry and one of these which has proved successful is the award of scholarships to final year B.Tech. Chemical Engineering students for undertaking industrial type of projects given by Messrs Carborandum Universal Limited. We hope that several more such schemes will fructify in the future.

## **Rural Development Programme**

We have organized during this year a novel scheme of rural development based, not on Government grants, but on the commercial loans taken from a bank. We hope to prove in this manner that rural development can be implemented on a self-sustaining and profitable basis and at the same time establish a commendably high quality of life.

## **Credit System of Instruction**

This year, we extended the credit system of instruction to all the postgraduate programmes. We have also organized Class Committees composed of students and staff to plan the academic courses. It is hoped that students and staff who are yet to realise the full scope of these committees, will, in due course of time, make this a most useful and effective means of feed back on our academic activities and thereby establish a continuously updated programme of instruction.

## **Awards received by faculty**

Several of our faculty have won national recognition for their research activity. These include Prof. P. T. Manoharan, Prof. Md. Roshan, Prof. L. N. Ramamurthy, Prof. V. C. Venkatesh, Dr. G. V. Subba Rao, Dr. M. Mukunda Rao, Dr. C. V. Reddy and Prof. M. Venugopal. Also, Prof. E. G. Ramachandran was honoured by being elected as the President of Indian Institute of Metals. Similarly, Prof. J. C. Kuriacose has been elected as the President of the Catalysis Society of India.

## **Sponsored Projects and Industrial Consultancy**

It is with some pride that we report that during the year under report, 33 projects of a total value of Rs. 1.55 crores were sanctioned for the Institute by various sponsoring agencies like DRDO, ARDB, etc. In addition, we had about 500 industrial assignments on hand and the income for the year at Rs. 29.75 lakhs was the highest ever. In particular, the average turnover per assignment increased from Rs. 4600/- to Rs. 8000/-.

## **Gymkhana**

For the tenth year in succession, we won the Inter-IIT Athletic Championship and this must be a unique record for any championship of this nature. In addition, our young Chess Champion, Shri Ramesh, won two All India Tournaments and has secured a Sports Talent Scholarship from the National Institute of Sports.

**DETAILS OF THE REPORT**  
**Admissions, Award of Degrees and Prizes**

**Student Admissions 1980 - 81**

The number of students and scholars admitted to various courses (1980-81) is given in Table - 1.

**Table - 1**  
**ADMISSIONS 1980 - 81**

Sl. No.	Department	B. Tech	M. Tech	DIIIT	M.Sc	MS	Ph.D.	Total
1.	Aeronautical Engg.	9	16	...	...	5	2	32
2.	Applied Mechanics	...	15	...	...	9	6	30
3.	Chemical Engg.	33	38	...	...	7	8	86
4.	Chemistry	...	...	...	21	...	20	41
5.	Civil Engg.	45	37	...	...	8	7	97
6.	Computer Science	...	36	...	...	7	2	45
7.	Electrical Engg.	69	82	...	...	22	11	184
8.	Humanities and S. S.	...	41	...	...	3	9	53
9.	Mathematics	...	...	...	18	...	5	23
10.	Mechanical Engg.	62	68	6	...	14	9	159
11.	Metallurgy	21	24	...	...	10	6	61
12.	Naval Architecture	9	...	...	...	...	...	9
13.	Ocean Engineering	...	6	...	...	3	2	11
14.	Physics	...	...	...	9	...	15	24
<b>Total</b>		<b>248</b>	<b>363</b>	<b>6</b>	<b>48</b>	<b>88</b>	<b>102</b>	<b>855</b>

The total 855 includes the following :

Foreign National	1	External Registration	64
Scheduled Castes	29	Project Staff	12
Scheduled Tribes	5	Part-time	5
Women	38		
QIP Scholars	8		
Sponsored candidates	21		

## Students Strength

The total strength of students and scholars in the departments are given below in the Table 2.

**Table - 2**  
**TOTAL STUDENTS STRENGTH 1980-81**

Sl. No.	Department	Under Graduate course	Post Graduate course	Research	Total
1.	Aeronautical Engg.	53	15	29	97
2.	Applied Mechanics	...	13	39	52
3.	Chemical Engg.	175	44	40	259
4.	Chemistry	...	26	85	111
5.	Civil Engineering	195	58	61	314
6.	Computer Science	...	61	21	82
7.	Electrical Engineering	318	108	78	504
8.	Humanities and S. Science	...	66	50	116
9.	Mathematics	...	28	31	59
10.	Mechanical Engg.	347	100	115	562
11.	Metallurgy	105	28	40	173
12.	Naval Architecture	38	...	...	38
13.	Ocean Engineering	...	8	14	22
14.	Physics	...	23	60	83
		1231	578	663	2472

The total of 2472 includes the following :

Foreign Nationals	73	D A E Scholars	9
Scheduled Caste	146	Project staff	59
Scheduled Tribe	12	Part-time	63
Women	105		
QIP Scholars	72		
External Registration			
Candidates	151		
CSIR Scholars	46		
Sponsored candidates	27		



## Degrees Awarded :

The number of degrees awarded at the Seventeenth Convocation of the Institute on 20th August, 1980, is given below in Table 3. Dr. A. Ramachandran, Under Secretary General, United Nations, Executive Director, UN Centre for Human Settlement, (HABITAT), Nairobi delivered the convocation address.

**Table - 3**  
**NUMBER OF DEGREES AWARDED**

Sl. No.	Discipline	B Tech	M Tech	M Sc.	DIIT	MS	Ph.D.	Total
1.	Aeronautical Engg.	7	4	...	...	...	2	13
2.	Applied Mechanics	...	8	...	...	8	2	18
3.	Chemical Engg.	33	22	...	...	11	5	71
4.	Chemistry	...	...	13	...	...	12	25
5.	Civil Engg.	33	25	...	...	2	5	65
6.	Computer Science	...	22	...	...	3	...	25
7.	Electrical Engg.	55	46	...	...	7	3	111
8.	Humanities and S. S.	...	24	...	...	6	1	31
9.	Mathematics	...	...	11	...	...	4	15
10.	Mechanical Engg.	69	50	...	10	6	7	142
11.	Metallurgy	17	19	...	...	1	2	39
12.	Naval Architecture	...	...	...	...	...	...	...
13.	Ocean Engineering	...	...	...	...	...	...	...
14.	Physics	...	...	17	...	...	9	26
Total		214	220	41	10	44	52	581

With this Convocation in August 1980 the number of degrees awarded so far by the Institute is :

B Tech.,	3995	DIIT	235	
M Tech.,	2121	M.S.	225	
M.Sc.,	564	Ph.D.	536	<u>Grand Total 7676</u>

## PRIZES

The names of the academic Prize Winners for the year are given below :

### 1. PRESIDENT OF INDIA PRIZE :

(For the student of the B. Tech degree course with the best Academic Record) Shri Venkatachalam Anantharam  
B. Tech. (Electrical Engg.)

### 2. GOVERNOR'S PRIZE :

(For all round proficiency in B. Tech. degree course). Shri Jairam Kamath  
B. Tech. (Mechanical Engg.)

3. MERIT PRIZES (for the students with the best academic record in each discipline of each course)

### B. TECH. COURSE :

Aeronautical Engineering	Shri V. Ashok
Civil Engineering	Shri B. V. Sainath
Metallurgy	Shri Suryanarayana Raja
Electrical Engineering (Electronics) (Philips India Prize)	Shri Venkatachalam Anantharam
Electrical Engineering (Power) (Siemens Prize)	Shri K. S. Ramanujam
Mechanical Engineering (Banco Foundation Prize)	Shri Inguva Sivasubramanyam
Chemical Engineering (Reliance Heat Transfer (P) Limited Prize)	Shri M. R. Sridharan

### M. TECH. COURSE :

Aeronautical Engineering	Shri N. Chellakumar
Civil Engineering	Shri Manohar Ashvatthama Mate
Computer Science	Shri P. Narendran
Engineering Mechanics	Shri K. I. Jacob
Maintenance Engineering and Management	Shri Vivek Krishnan Nair Govind
Industrial Engineering	Shri Balavat Sailesh Sankalchand
Industrial Management	Shri V. Ramakrishnan

Industrial Tribology	Shri T. Rathina Kumar
Mechanical Engineering	Shri N. Ramarathnam
Metallurgy	Shri Mukthimuthulapati Srinivas
Electrical Engineering (Siemens Prize)	Shri Sanjoy Choudhury
Chemical Engineering (Prof. B. Sengupto Prize)	Shri M. Kannappan
Metallurgy (Metal Casting Option) (S. Anantharamakrishnan Memorial Prize)	Shri P. Govindarajan
Mechanical Engineering (Machine Tools Option) (Dr. S. Vaidyanathan Memorial Prize)	Shri S. Sukumar
Chemical Engineering (Dr. K. Subbaraju Memorial Prize)	Shri M. Kannappan

**M. Sc. COURSE :**

Chemistry	Shri A. Sudhakar
Mathematics	Miss N. Sathiyavathy
Physics	Shri G. Raghurama

**D. I. I. T. COURSE :**

Mechanical Engineering (Aircraft Production)	Shri R. Nagaraju
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## SPONSORED PROJECTS (1980-1981)

### Sponsored Research Schemes/Projects

The following 33 projects of a total value of Rs. 1.55 crores were sanctioned during the year under report.

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Sl. No.	Name of the Sponsoring authority	Title of the project
<b>Aeronautical Engineering</b>		
1.	A R D B	Development of Reverse flow combustion chamber.
2.	T T C	Critical analysis of Bus coaches for Drag and weight reduction.
<b>Applied Mechanics</b>		
3.	D A E	Studies on investigations of fluid flow through cyclone separators.
<b>Chemical Engineering</b>		
4.	D A E	Studies on Rotary Jet Grinder-A new fluid energy mill.
<b>Ocean Engineering Centre</b>		
5.	D E F	Analysis and design of Buoys.
6.	D E	Design of underwater towed bodies.
<b>Electrical Engineering</b>		
7.	D A E	Study of cross-core transformers and their applications to EM pumps for large fast breeder reactors.
<b>Centre for Systems and Devices</b>		
8.	D S T	Design & Development of microwave Antennas employing edge diffraction techniques.
9.	D R D O	Compatibility problems of shipboard and air-borne antennas.
10.	D R D O	Design & Development of a microprocessor based near field scanning system for determination of farfield patterns.
11.	D R D O	Development of molecular Beam Epitaxial Devices for Infrared Detection
12.	I S R O	High Performance Reflector Antennas.
13.	I R D F	Microprocessor based information systems.
<b>Humanities &amp; Social Sciences</b>		
14.	I C S S R	Predicting managerial effectiveness - A study in personnel selection.

---

## Mathematics

15. C S I R Homorheology - clinical, experimental and theoretical studies.

## Mechanical Engineering

16. D S T Pneumatic conveyance of powdered materials at high concentrations.
17. C S I R Behaviour of Tungston carbide Tool inserts in Mechanical and Thermal Fatigue
18. N S F Combustion of Alcohol and Biogas.
19. C S I R Investigations on the effects of parameters like porosity ..... of sintered bearings.
20. D S T Long-term performance tests of the 10 KW solar electric power generating comonstration units
21. D S T Conceptual cesigns & feasibility studies for development of an integrated energy system for dairies in Rural India.

## Physics

22. D A E Studies of adsorption and desorption under conditions of ultra high-vacuum & low temperature.
23. D S T Development of materials for magneto optic recording.
24. D S T Thermophysical property measurement at low temperatures.

## Chemistry

25. D S T Chemical investigations on Castor oil - a versatile raw material.
26. A R D B High Hot Cascade Test Righ.
27. D S T Development of Newer Materials Through organo Phosphrous and Flouride Compounds.
28. D S T Studies in Electro-organic Chemistry.
29. D A E Study of Degradation of Mechanical Properties of Filament Mould Fibreglass Reinforced Plastics Pipes due to Nuclear Irradiation.
30. D S T Design and Development of optimal solar continuous absorption refrigeration and Airconditioning Systems.
31. A R D B Super Plastic Forming of Sope Aluminium and Titanium Alloys.
32. D S T Development of optical grade crystalline laser materials.
33. D S T A study of molecular impurities in crystals.

There are at present 115 ongoing Projects including the above.

## **RESEARCH CENTRES**

Centre for Systems and Devices

Energy Research Centre

Fibre Reinforced Plastics Research Centre

Materials Science Research Centre

Ocean Engineering Centre

## CENTRE FOR SYSTEMS AND DEVICES

After having completed several projects sponsored by RCPO, Ministry of Defence to the tune of Rs. 88 lakhs, the CSD has been sanctioned during the year 1980-81, the following five projects for a total out-lay of about Rs. 75 lakhs by the Research and Development Organisation, also of the Ministry of Defence (DRDO) :

- 1) Compatability Problems of Shipboard and Airborne Antennas.
- 2) Development of Molecular beam epitaxial Devices for infrared detection.
- 3) Design and Development of a Microprocessor based near-field scanning system for determination of far field patterns.
- 4) A digital distribution free-Doppler processor and
- 5) Fibre optics communication system for Vijayantha Tanks.

Sanction for one more major 24 lakhs project on 'Signal Processing for optimal estimation for Missile guidance' to the CSD from the Aeronautical Research and Development Board, New Delhi has also been approved recently. In addition to the above, the CSD has in operation two projects from DST and one project each from ISRO, EC and ARDB. During the year under review, a new laboratory for microprocessor systems has been added to the CSD. A project for the assembly of a Management and Information System has been taken up by this laboratory, with funds from the Institute R and D earnings.

## ENERGY RESEARCH CENTRE

### a) Electrical Energy Division

#### QIP/UGC Teacher Fellowship

Programmes	M.S.	Ph.D.
No. trained so far	1	2
No. on rolls	Nil	2

#### Important Lectures and Seminars

" Workshop on DST/GRF sponsored projects in Power Systems", held on 18th and 19th, Dec. 1980.

#### Research and Development

Sponsored Research projects under progress in the year (Title of the project/ sponsor, total financial outlay co-ordinators of the project)

- i) Project on 'Development of Hardware and Software for the Computer aided power system data and control' Department of Science and Technology, New Delhi - Rupees Five Lakhs - Dr. A. Kuppurajulu and Dr. S. Elangovan.
- ii) ERC Project on 'Development of Hardware for load frequency control of power systems' Centre of Energy Studies, New Delhi - Rupees One Lakh - Dr. A. Kuppurajulu and Dr. C. Venkatasessaiah.

### **Research Publications**

- i) 'A fast power flow solution by the method of reduction and restoration', T. Krishnaparandhama, S. Elangovan, A. Kuppurajulu and V. Sankaranarayanan, in the March 1980 issue of IEE Proceedings London.
- ii) 'Method for identifying coherent generators', T. Krishnaparandhama, S. Elangovan and A. Kuppurajulu, in the International Journal of Electrical Power and Energy Systems, April 1981.
- iii) 'Equivalent for power system stability studies', C. Kanniyappan and S. Elangovan, in the Journal of the Institution of Engineers (India), Electrical Engineering Division, February 1981.
- iv) 'Coherency identification and equivalents for transient stability studies', V. Sankaranarayanan, C. Kanniyappan, S. Elangovan and M. Venugopal in the Journal of the Institution of Engineers (India), Electrical Engineering Division, April 1981.

### **Assistance to Industry - ICC**

Major ICC projects executed during the year (those involving Rs. 5000/- and above)

- i) Project on load forecasting sponsored by the TNEB.
- ii) Minimization of line losses in TNEB Grid sponsored by TNEB.

### **New Major Equipment Added**

- i) D.C. Motor driven alternator system to simulate transients in power systems.
- ii) PDP 11 mini computer.

### **Equipment Fabricated**

Interfaces have been developed and fabricated to connect the existing a.c. network analyser with the mini computer mentioned above for on-line computing systems of a model power system network.



## Visitors to the Department

- i) Participants of "Workshop on DST/GRP sponsored projects in Power Systems", held on 18th and 19th Dec. 1980.
- ii) Professor Jayasekara, Dean, Faculty of Engineering, University of Peradeniya, Sri Lanka.

Brief indication of special development programme planned/likely to come up.

- i) On line computing system under installation.
- ii) Microprocessor control of alternator to simulate the behaviour of a power system.

## b) Solar Energy Division

### M. Tech./M.S./Ph.D. Scholars working on Solar Energy

	M. Tech.	M.S.	Ph.D.
No. of trained so far	6	3	3
No. on rolls in each of these courses	1	—	3

## Important Lectures and Seminars

Weekly seminars and occasionally Lectures from visiting scientists are being arranged.

## Research and Development

- i) Solar Space Cooling—partially funded by the Centre for Energy studies, IIT-Delhi.
- ii) An Indo-Australian project on Ammonia Absorption Refrigeration system is being undertaken.

## Research Publications

- i) Shet, U. S. P., Thomas, A. J. and Gupta, M. C.: Simulation studies of a Solar Water Heating System: 1980 International Symposium on Solar Energy Utilization, The University of Western Ontario, Canada, August 10-24, 1980.
- ii) Gad, H. E., Shet, U. S. P., and Gupta, M. C.: An Experimental Investigation on the thermal performance of a forced circulation Solar Water Heating System, 3rd Miami International Conference on Alternative Energy Sources, Florida, U. S. A., Dec. 15-18, 1980.
- iii) Gad, H. E., Shet, U. S. P., and Gupta, M. C.: Theoretical Analysis of Corrugated-Sheet flat plate collector, National Solar Energy Convention, Annamalai University, December 19-21, 1980.

- iv) Gandhidasan, P., Sriramulu, V., and Gupta, M. C. : 'Heat and mass transfer in a solar regenerator' Chem. Engg. Journal, Vol. 21, No. 1, 1981.

### **Departmental Projects**

- i) Solar Air Conditioner for Hot Humid Climate (Open Desiccant Systems).
- ii) Investigations of double exposure collectors Solar Operated Ammonia Absorption Refrigerator Optimisation of a Solar Water Heating System.

### **Investigations of passive cooling systems**

#### **Assistance to Industry - ICC**

The division is rendering consultancy assistance in the area of Solar Energy and energy conservations to several firms in and around Madras.

#### **New major equipment added**

A non-contact type magnetic flow meter is going to be procured, for work on flow measurement in collector-storage system.

#### **Visitors to the Department**

Prof. Lumsdaine, of the University of New Mexico, visited the Solar Energy Division on March 9, 1981 and had discussion, on energy related problems with the faculty and students.

#### **Brief indication of developmental programme likely to come up**

The major areas of research are in the following :

- i) Solar refrigeration (Intermittent & continuous).
- ii) Double Exposure collectors and optimisation of Solar Water heating system.
- iii) Investigations on solar stills.
- iv) Solar space cooling

#### **c) Wind Power Division**

In collaboration with BHEL. R & D, Hyderabad, the wind power division has developed a Vertical Axis Wind Turbine of Darriens type, which has been installed in the campus of Saurashtra University at Rajkot. The machine develops a power of 1.55 kw at the design wind speed of 25 kmph and 2.7 kw at a speed of 30 kmph. It is now proposed to manufacture a larger number of machines and to instal them at various places in the country for testing. This work has been funded by the Department of Science and Technology.

# FIBRE REINFORCED PLASTICS RESEARCH CENTRE

## Courses :

One postgraduate course has been offered during the year. One M.S. student has joined for research work.

## New Courses introduced

“Composite materials” has been included as a part of the first year undergraduate course “Engineering Materials”.

## Educational Programme

(Continuing Education Programme)

- i) Short course on FRP held at Trivandrum in collaboration with VSSC, Trivandrum and Lal Bahadur Shastri Centre of Govt. of Kerala, April 1980.
- ii) Short course on Reinforced Plastics for electrical, electronic and communication applications held at I. I. T. Madras, January 5th to 9th 1981.
- iii) Workshop on FRP Technology held at IIT Madras in collaboration with the Government of West Bengal, March 16th to 27th 1981.
- iv) Participated in the HAL training programme for engineers and managers.

## QIP/UGC Teacher Fellowship Programme

Serving Teachers' Programme

Ph.D.

No. of trainees so far for

1

## Research and Development

- i) Studies on Jute polyester composites and their applications.
- ii) Studies on fibre reinforced thermoplastics.
- iii) Development of process and machinery to make chopped strand mat and rovings.
- iv) Development of transport applications of FRP.
- v) Development of transducer staves for Sonar signal and communication systems.

## **Research Publications**

Papers	:	2
Departmental projects	:	3

## **Assistance to Industry**

The Centre has maintained its industrial services by offering technical advice, taking up industrial consultancy projects and organising short courses for the engineers working in the industry. Thirteen industrial consultancy projects for a total amount of Rs. 35,000/- were taken up during the year.

## **Sponsored Projects**

Work on two existing projects are being continued. The following two new projects have been taken up during the year.

- i) Critical analysis of Bus coaches for Drag and Weight reduction sponsored by Thiruvalluvar Transport Corporation Madras (In collaboration with Departments of Aeronautical Engineering and Applied Mechanics.)
- ii) Study of degradation of Mechanical properties of filament wound fibre-glass reinforced plastics pipes due to Nuclear Irradiation sponsored by Department of Atomic Energy.

## **New Major Equipment added**

- i) Weatherometer for environmental testing
- ii) Sigma Mixer for BMC and SMC making

## **Invited lectures delivered by the staff :**

"Designing with Fibre Reinforced Plastics", Lecture delivered at the National Design Conference held at I. I. T. Bombay in January 1981 by Dr. N. G. Nair.

## **Development Programmes likely to come up in the near future**

- i) Study of sandwich composites with financial assistance from AR and DB.
- ii) Analysis of joints and cut-outs of composite structural components of aircrafts in collaboration with H.A.L., Bangalore.

# MATERIALS SCIENCE RESEARCH CENTRE

## Important Lectures and Seminars

Title	Speaker
i) 'Crystal Chemistry of the Sialons'	Prof. K. H. Jack University of Newcastle Upon Tyne United Kingdom
ii) 'Mixed Metal Oxide Chemistry'	Dr. J. M. Longo Exxon Res. Laboratories Linden, New Jersey, USA
iii) 'Vapor Crystal Growth'	Dr. F. Rosenberger University of Utah Utah, USA
iv) 'Group IV Metal Phosphates'	Prof. A. Clearfield Texas A & M University Texas, USA
v) 'Zirconia - A Promising High Strength Material'	Dr. R. Suryanarayanan Manager Materials Science Divn. R & D, BHEL, Hyderabad
vi) 'Selective Solar Absorber Coatings based on Black Chrome'	Dr. K. Raghunathan Director of Research Berry Solar Products Edison, N J, USA

## Research Publications

i) Papers published	8
ii) Papers presented at National and International Conferences	15

Departmental Projects : 2

## Assistance to Industry

Industrial consultancy has been undertaken with CECRI, Karaikudi and BHEL Trichy. This is also coordinated through Central X-ray lab. and the Department of Chemistry.

## Visitors to the Department

1. Prof. K. H. Jack, University of Newcastle Upon Tyne, UK.
2. Dr. J. M. Longo. Exxon Res. Laboratories, New Jersey, USA.
3. Dr. F. Rosenberger, University of Utah, Utah, USA.
4. Prof. A. Clearfield, Texas A & M University, Texas, USA.
5. Dr. R. Suryanarayanan, Manager, Materials Science Divn., Research & Development, BHEL, Hyderabad.
6. Dr. K. Raghunathan, Berry Solar Products, Edison, NJ, USA.

## Invited Lectures Delivered by the Staff

- i) Prof. G. Aravamudan delivered an invited talk at the National Symposium on Microchemical Technique, Mysore.
- ii) Dr. G. V. Subba Rao delivered an invited talk at the seminar on 'Current Trends in Magnetism', IIT Delhi. He spent two months as visiting scientist at Argonne National Laboratory, USA and gave invited talks at Purdue University, Lafayette, Indiana, IBM Thomas J. Watson Research Centre, New York, USA and University of Munster, Munster, West Germany. He has been recently elected as the Fellow of Royal Society of Chemistry (FRSC) (Lond.), C. Chem.

## Developmental Programmes likely to come up in the near future

- i) Study and development of electrochemical wet cells for solar energy conversion employing semiconductor electrodes.
- ii) Hydrogen energy project - Part A of the National Coordinated Project.
- iii) Development of High Temperature Structural Ceramics.
- iv) Physico Chemical Aspects of metal incorporation into transition metal chalcogenides.

## OCEAN ENGINEERING CENTRE

**Education Programme - Continuing Education Programme.**

### Short term Course

Marine Mineral Exploration held from 23rd June to 2nd July 1980 Quality Improvement Programme/UGC Teacher Fellowship Programme.

Serving Teachers Programme	Ph.D.
No. of trainees so far for	Nil
No. on rolls	One

### Important Lectures and Seminars

Title	Speaker
i) Wave and Wave Force Measurement in the North Sea	Mr. M. Beier University of Karlsruhe West Germany
ii) Multilevel approach to minimum weight design including buckling constraints	Dr. K. Ramanathan University of Southern California USA.

Title	Speaker
iii) Ocean Pollution and its effects with special reference to the Indian coast	Dr. C. A. Sastry Scientist-in-charge NEERI, CSIR, Madras,
iv) Dock and harbour works : Some aspects of Design and Planning	Brig. Ombir Singh Chief Engineer Military Engineering Services Secunderabad.
v) Marine Instrumentation	Dr. P. E. Sankaranarayanan Scientist-in-chief NEERI, CSIR, Madras.
vi) Cyclone and Warning Systems	Mr. K. Veeraraghavan Meteorologist Regional Meteorological Centre Madras.
vii) Measurement of disperision coefficient in a coastal inlet near Madras	Dr. K. V. N. Sarma Department of Civil Engg., Indian Institute of Science Bangalore
viii) Flow of lighter water over relatively denser water where the density difference is due to temperature or salinity	
ix) Use of sub-sea work systems for underwater activities offshore	Mr. I. Datta Strathclyde University Glasgow, England.
x) An assessment of uncertainties in the short and long term frequency domain response of steel jacket offshore platforms	Mr. Shyam Sundar Department of Civil Engg. Massachusetts Institute of Technology Cambridge, USA.
xi) Long term random sea-state modelling	
xii) Standard processing of strong motion earthquake signals	Mr. Shyam Sundar Department of Civil Engg. M.I.T., U.S.A.
xiii) Problems of in-situ measurement in the Ocean	Prof. W. Kroebel Institute fur Angewandte Physik der Universitat Olshausenstr Kiel, West Germany.
xiv) Methods and means used in BSHC to solve problems in sea keeping and manoeuvring	Dr. P. Bogdonov Director Ship Hydrodynamics Centre at Varna Bulgaria.
xv) Teaching aids and demonstration equipment in the area of oceanography	Mr. J. Phillips Open University, U. K.

## **Research and Development**

Publications : Total number published in		
journals/Conference	...	8
Technical Reports	...	12

## **Assistance to Industry - ICC**

Industrial Consultancy work has been undertaken on various projects and project worth of Rs. 3.14 lakhs have been earned/approved by ICC.

## **Sponsored Projects**

A project entitled 'Design of Underwater towed bodies' has been sanctioned by the Electronics Commission, for three years with a financial outlay of Rs. 8.0 lakhs.

## **Additional space Laboratory etc. provided**

The construction of the Laboratory is to be completed in July 81. The area for this lab is about 1600 m<sup>2</sup>.

## **New Major equipment added**

- Fabricated : 1. Equipments for testing of liquifaction of Soil  
2. Load frame for structural testing

## **Visitors to the Department**

- i) Mr. Manfred Beier, University of Karlsruhe, West Germany
- ii) Dr. K. Ramanathan, University of Southern California, USA
- iii) Brig. Ombir Singh, Chief Engineer, Military Engg. Services, Secunderabad.
- iv) Dr. Peter Bogdonov, Director, Ship Hydrodynamic Centre at Varna Bulgaria.
- v) Mr. J. Phillips, Open University, U.K.
- vi) Prof. D. V. Reddy, Visiting Professor, Univ. of Florida, USA
- vii) Prof. P. Holmes, Univ. of Liverpool, U.K.
- viii) Prof. Dr. Ing. E. Plate, Institut Wasserbau III an der Univ. Karlsruhe, West Germany
- ix) Prof. Hudson Matlock, Vice President for Research & Development, Consulting Engineers & Geologists, (Fugro Inc.) California, USA
- x) Mr. Eri J. Executive Vice President, Det Norske Veritas, Norway



- xi) Mr. Stanley G. Stiansan, Vice President, American Bureau of Shipping, New York USA
- xii) Prof. L. C. Reese, The Univ. of Texas at Austin, USA
- xiii) Prof. A. F. Richards, Director, Marine Geotechnical Lab., Lehigh University, Bethelehem, Penn., USA
- xiv) Prof. C. L. Bretschneider, UNDP Expert, C/o. Engineers India Ltd., Bhubaneswar
- xv) Prof. W. Kroebel, Institut fur Angewandte Physik der Univ. Olshausenstr Kiel, West Germany.

### Invited Lectures Delivered by the Staff

Topic	Name of Staff
i) 'Case study of Piling in Ports' at SERC, Madras during the course on Design and Construction of Offshore and Marine Structure - 29th January 1981.	Prof. V. S. Raju
ii) Special lecture on 'Foundation aspects of marine structures' at Rameshwaram on 25th January 1981 to the audience of Engineers & Chief Engineers of Port Trusts & Shipping Organisations	Prof. V. S. Raju

### Different Category of Staff who have joined during the period

1. Dr. K. Ganesh Babu, Assistant Professor
2. Dr. C. P. Vendhan, Assistant Professor
3. Sri S. K. Bhattacharya, Sr. Scientific Officer Gr. II
4. Sri V. G. Idichandy, Scientific Officer Gr. II
5. Sri N. R. Joglekar, Sr. Scientific Officer Gr. II
6. Sri S. Meenakshisundaram, Scientific Officer

### Other Information

The First Indian Conference in Ocean Engineering was held from 18-20, February 1981. The Conference received an overwhelming response with 18 sponsoring organisations with more than 300 delegates including 25 foreign delegates from 15 countries. There were 89 technical papers presented and 11 special lectures by International experts were delivered.

The Conference was inaugurated by Prof. S. Nurul Hasan, Vice President, CSIR. Vice Admiral N. P. Datta, Chairman & Managing Director, Mazagaon Dock, Bombay delivered the Keynote Address. The Valedictory Address was given by Vice Admiral M. K. Roy, Flag Officer Commanding in Chief, Eastern Naval Command and Sri V. Selvaraj, IAS, Chairman, Madras Port Trust presided over the valedictory function.

A Photographic Exhibition relating to the various facets of Ocean Engineering activities at home and abroad has been arranged in connection with the above Conference. This has inculcated a good amount of interest and there were eight participants, including two from West Germany.

## **SCHOOLS FOR EDUCATIONAL DEVELOPMENT**

**Chemical Engineering Education Development Centre**

**Mechanical Engineering Education Development Centre**

## CHEMICAL ENGINEERING EDUCATION DEVELOPMENT CENTRE

### Books Published :

1. Chemtech IV.
2. Instrumental methods of analysis - A laboratory manual.
3. Chemical Engineering Economics and decision analysis.
4. Materials of construction for the process industry.
5. Mass transfer operations - A laboratory manual.

### Curriculum development

Prepared a draft curriculum and syllabi for the 4 year degree course in Chemical Engineering as desired by the Ministry of Education, New Delhi.

### Continuing Education Programme

Organised jointly with the Max Mueller Bhavan, Madras, a 5 day workshop on 'Design of University Publications', conducted by Mr. Walter Plata for the benefit of faculty and other staff involved in publication work.

### Books under Publication

1. Unit processes in organic chemical industries.
2. Small scale industry in the chemical sector - problems and prospects.
3. Data book for chemical engineers and technologists.
4. Non-ferrous metallurgical industries.

## MECHANICAL ENGINEERING EDUCATION DEVELOPMENT CENTRE

The centre has been established under the sponsorship of the Ministry of Education and Culture with the following objectives : (i) Development of curriculum and laboratory experience (ii) Study of appropriate learning situations and teaching methods and interaction between teaching and research (iii) Development of evaluation procedures including examination reform, instruments and demonstration experiments (iv) Study of interaction between industry, research and education (v) Processing of information and data and analysis of equipment in relation to laboratories and training (vi) Integration of the education process in relation to humanities, engineering and science (vii) Preparation of instructional materials, laboratory guides and text book materials.

Keeping the above objectives in focus, the centre has conducted a number of programmes during the past few years since its inception. During the current academic year, the following programmes have been completed.

## **Seminars Conducted**

Two one-day seminars were conducted during the year.

- i) 'Practical Content (Laboratories Workshop and Engineering Graphics) of the four year Undergraduate Programme' - October 11, 1980. Principals and Senior Professors of other Engineering Colleges along with Professors of IIT interacted. A sub-committee specified the different laboratories that should be included in the curriculum along with their sequence. The list of experiments in each laboratory has also been drawn.
- ii) 'Recent Advances in Humanities and Social Sciences : Their impact on Engineering Education' - March 21, 1981. Professors of other Engineering Colleges and Universities both in the field of Mechanical Engineering and Humanities and Social Sciences participated in the Seminar. The seminar was guided by Dr. Mrs. Indiresan, Dr. S. Sathikh and Dr. Miss Vedanayagam. New areas of developments in the field of Social Sciences that will be of relevance to the Mechanical Engineers were identified.

## **Publications**

- i) A booklet on Creative Design Curriculam - 1980.
- ii) A booklet on Practical Content (Laboratories, Workshop and Engineering Graphics) of the Four Year Undergraduate Programme - 1981.
- iii) Steam Tables and Mollier Charts in SI units - 1981.

## **Equipment added**

- i) Overhead Projector.
- ii) Xerox copier (under order)

Latest Bulletins of most of the American Universities have been obtained. They are available for reference.

## **SPECIAL FACILITIES**

Industrial Consultancy Centre

Engineering Design Centre

Central Electronics Centre

Regional Sophisticated Instrumentation Centre

## INDUSTRIAL CONSULTANCY CENTRE

### Patents

Patents Processed	.....7
Patents Obtained	.....4

### Assistance to Industry - Industrial Consultancy Centre :

The activities of the Industrial Consultancy Centre began with a get-together with Industrialists in and around Madras for active collaboration between the Institute and Industry. This was followed up by a communication to all leading Industries in India with specific proposals such as :

- (a) Sponsoring Projects to I. I. T. for utilisation of facilities at I. I. T. Madras.
- (b) Seconding Faculty members to Industries during vacation and
- (c) Inviting the practising Engineers as Visiting Faculty for shorter duration.

These proposals received encouraging response. Organisations like Carborandum Universal Limited; T. I. Cycles of India Limited; Enfield India Limited and Metal Box Company of India Limited have come forward for one scheme or other listed above. For example, Carborandum Universal Ltd., have sponsored three projects at B. Tech. level which will be carried out to Doctoral level depending upon the progress made during the Course of this experimentation. Also a M. S. Project has been given to the Department of Chemical Engineering by Carborandum Universal Ltd., In the case of Enfield India and T. I. Cycles the project referred are in the nature of consultancy, while in the case of Metal Box, it was in the nature of stipendiary scheme during the tenth semester. Organisations like Mysore Kirlosker Limited, Best & Crompton and Madras Fertilisers Limited, have also come forward to suggest suitable scheme for active collaboration between the Institute and Industry.

In the area of consultancy, the year 1980-'81 has been a very successful year. As against the turn over of Rs. 22.9 lakhs for nearly 500 assignments during 1979-'80 the turn over for the year 1980-'81 reached Rs. 29.75 lakhs for 381 assignments.

In the area of sponsored Projects also, commendable progress was achieved as nearly 30 projects totalling to a value of Rs. 155 lakhs were sanctioned till March, 1981. Of the above, agencies like D. R. D. O, A. R. D. B. alone have sanctioned projects worth Rs. 70/- to 75 lakhs which indicates that the activities of sponsored research are oriented towards applications which are of interest to the space and defence activities of the country.

Four patents were issued by the Controller of Patents in the name of the Institute while seven applications have been made for taking patents. In the area of transfer of technology, four agreements were signed with private organisations out of which three were for transferring the know-how for manufacture of prestressed concrete sleepers while the other one is for transferring the know-how for manufacture of carbon pellets utilising the carbonatious waste material.

In order to make the Industrial and Research Organisations aware of the facilities and expertise available at the Institute, a quarterly publication titled "Research & Consultancy at I. I. T, Madras" was started in September 1980. Three issues have been brought out so far.

## ENGINEERING DESIGN CENTRE

<b>Number of Patents processed</b>	1
<b>Departmental Projects</b>	6

### Assistance to Industry

Consultancy services were provided to Rayala Corporation, Madras, Binny Limited, Madras, Avanti Leathers, Madras, Institute of Road Transport, Madras & Tractors & Farm Equipment Limited, Madras.

### Sponsored Project

The Centre is designing and developing a Bus Driving Simulator for the Institute of Road Transport, Madras.

### Products Fabricated

- i) Driver Anthropometer.
- ii) Knapsack Power Sweeper.
- iii) Biogas plant.
- iv) Monitoring Telescope for Indian Navy.

### Developmental Programme

The centre proposes to develop a series of simulators, devices for physically handicapped, devices for use in rural areas and optical instruments and systems.

## CENTRAL ELECTRONICS CENTRE

### Educational Programme - Continuing Education Programme

#### Short Term/Part Time Course Conducted

- i) **Apprentice Training Programme - Third Apprentice Training Programme** was started on November 1980 - Duration 12 months Number of Candidates - Ten.



- ii) Short Term Training Programme - Two Candidates from Perarignar Anna University of Technology, Guindy, Madras were trained in Electronics and Instrumentation for Eight Weeks.

### **Research & Development**

- i) Strain gauge Transducers for Ultrasonic vibration on Heat Treatment for M. Tech project in the Department of Metallurgy.
- ii) Measurement of Welding Parameters for M. Tech project for the Department of Metallurgy.
- iii) Broaching Tool Dynamometer for Ph. D project for the machine tools and production engineering - Department of Mechanical Engineering.

### **Assistance to Industry - Industrial Consultancy Centre**

- i) Ultrasonic Vibrator 'Sonostat' of Central Leprosy Teaching and Research Institute, Chingleput - Work under progress. (Expecting spares from Abroad).
- ii) Amplifier/Power supply unit/Speed control unit for Rane Brake Linings Limited, Madras and earned Rs. 2,250-00.
- iii) Two numbers of Electronic control unit for Amalgamations Repco Limited, Madras and earned Rs. 5,000-00.
- iv) One Russian Forging Machine at Ramnath Metal Forging Madras and earned Rs. 3,000-00.
- v) Fabrication of an Amplifier for G. S. R. D. Machine for Rane Brake Linings Limited, Madras and earned Rs. 2,800-00.
- vi) Micronephelometer for The Alkali and Chemical Corporation of India Limited, Madras and earned Rs. 2,500-00.
- vii) H. B. M. Loadcells for Calico, Anik Chembur. Bombay and earned Rs. 6,000-00.

### **New Major Equipment Added**

- i) 0-10 MHz Single beam oscilloscope, Aplab make India.
- ii) 0-200 MHz Frequency Counter, Radart make, India.
- iii) Function Generator, HPL, India.
- iv) 3.5 Digit Digital Multimeter.
- v) IC Design Kit from Instruments and Controls, India.

## **Fabricated**

- i) A two channel Analogue Multiplier circuit for a Ph.D project in IC Engines Laboratory of Mechanical Engineering, Department.
- ii) Strain gauge loadcell for 10 Tons - Ph.D project for ME MH Lab, Department of Mechanical Engineering.
- iii) An amplifier for GSRD machine for Rane Brake Linings Limited, Madras.

## **Visitors to the Centre**

Dr. S. Gnanalingam, Director, Ceylon Institute of Scientific & Industrial Research.

## **REGIONAL SOPHISTICATED INSTRUMENTATION CENTRE**

### **Courses**

R. S. I. C. Faculty takes part in the teaching activities of Chemistry Department; so the activities on courses are included in the Chemistry Department.

### **Important Lectures and Seminars**

	Title	Speaker
i)	Time resolved E. P. R. Spectroscopy	Dr. Balu Venkataraman (T.I.F.R.) Bombay
ii)	NMR Spectra of Biological Molecules.	Dr. G. Govil (T.I.F.R.) Bombay

### **Research and Development**

Faculty of R. S. I. C. have been guiding research in Molecular Spectroscopy for Ph.D Degrees. A total of 9 Ph.D students are registered under the three faculty members. Number of papers published 15.

### **Departmental Projects**

(Ph.D Research projects) 7.

### **Assistance to Industry**

Routine service of providing spectroscopic Analysis of Industrial samples was done on various Spectrometers.

## Sponsored Projects 1980-81

3

### Additional Space/Laboratory Provided

A three storied annexure (6000 Sq. Ft.) to the present RSIC has been provided for housing additional equipment due to expansion of RSIC activities.

### New Major Equipments

- i) Varian E-112 EPR Spectrometer ordered in 1979 was received during this year and is being installed in the new annexure.
- ii) Steroscan S-180 Cambridge Scanning Electron Microscope with X-ray analytical facility procured last year was installed during this year.
- iii) A CTI Cryodyne cryoculer for ultra low temperature spectroscopic measurement was installed.

### Equipment Fabricated

A micro spectrophotometer under a D.S.T. project has been fabricated for making measurement on polarised optical spectra of pure single crystal.

### Visitors to the Department

- i) Dr. Iyengar - Bhaba Atomic Research Centre
- ii) Dr. Raja Ramanna - Scientific Advisor, Defence Ministry
- iii) Dr. M. G. K. Menon - Secretary, D.S.T.
- iv) Delegation from - Kenya.

### Invited Lectures Delivered by the Staff

Title	Speaker
i) Exchange Interactions in one dimensional magnets.	Prof. P. T. Manoharan
ii) Forbidden Hyperfine Interactions in some d systems.	Prof. P. T. Manoharan
iii) Polarised Optical spectra of Cu and Ni dithiocarbanates.	Prof. P. T. Manoharan
iv) IR band Intensities of overtones and combinations bands.	Prof. Surjit Singh
v) Solvation Desolvation Model for Solute - Solvent Interactions.	Prof. Surjit Singh
vi) Application of NMR in structural elucidation.	Prof. S. Subramanian
vii) NMR and Biological applications.	Prof. S. Subramanian
viii) Jahn Tellor effect in EPR.	Prof. S. Subramanian

### **Any other Information**

Prof. P. T. Manoharan was awarded fellowship of the Indian Academy of Sciences. Prof. Surjit Singh and Prof. S. Subramanian were awarded A. V. H. Fellowships by West Germany and after availing the Fellowships they have joined the Centre.

### **Brief Indication of Developmental Programme Likely to Come up in the Near Future**

- i) EPR of excited states.
- ii) Preparation of charge transfer complexes and study of their magnetic properties.
- iii) Setting up of facilities in solid states high power pulse NMR spectroscopy in Inorganic solids.
- iv) Raman Spectral studies of aqueous solutions of biomolecules.

## **CENTRAL SERVICE FACILITIES**

Central Glass Blowing Section

Central Photographic Section

## CENTRAL GLASS BLOWING SECTION

The unit is well equipped with sophisticated glass blowing equipment such as high frequency generator, horizontal-cum-vertical lathe, forming lathe, universal lathe, grinding and polishing machines.

The Unit is turning out high vacuum stop-cocks and interchangeable ground glass joints, cryogenic and high vacuum glass system and other types of complicated glass apparatuses. Facilities are also available for quartz blowing. The section also offers training in glass blowing to Post Graduate students.

## CENTRAL PHOTOGRAPHIC SECTION

Since its inception in 1967, the Central Photographic Section has been catering to the needs of the various faculties in the Institute and the neighbouring Institutions viz, Cancer Institute, IBMS, A. C. College and University of Madras both staff and students. Different photographic work such as photo taking and movie making and processing of black and white movie films, microphotography, Photomicrography slide preparation, documentation, circuit diagrams (printed circuits) developing, enlarging and processing are undertaken by the section.

## **DEPARTMENTS**

**Aeronautical Engineering**

**Applied Mechanics (Including Bio-Engineering)**

**Chemical Engineering**

**Chemistry**

**Civil Engineering**

**Computer Science**

**Electrical Engineering**

**Humanities and Social Sciences**

**Mathematics**

**Mechanical Engineering**

**Metallurgy**

**Physics**

## AERONAUTICAL ENGINEERING

**New System/Method Added :** Credit System for M. Tech. introduced.  
 Combined Assessment System on Selected basis for fourth year B. Tech. introduced.

**Changes made in Curriculum:** M. Tech. Curriculum Revised.  
 B. Tech. Curriculum for fourth year— Course being Introduced.

### Quality Improvement Programme/UGC Teacher Fellowship Programme Serving Teachers Programme

	M. Tech.	Ph. D.
Number of Trainees so far For	1	3
Number on Rolls in each of these Courses	Nil	1

### Important Lectures and Seminars

i) Noise Problems in Aerospace	Prof. K. Karamchetti, Stanford University, U.S.A.
ii) Experiments in Boundary layer	Dr. K. S. Yajnik N.A.L., Bangalore.
iii) Experiments for Airbreathing Engines	Dr. J. Paulon, ONERA, France.
iv) Space Travel	ASTRONAUT. Charles Duke, U.S.A.

### Research and Development :

#### Research Publications

Papers - Total numbers published in journals	: Total so far — 111 papers In 1980-'81 — 14 papers
Books/Monograph-Title-Authors publicity year	: Total so far — 5 In 1980-'81 — Nil
Departmental Projects	: B. Tech. — 10 M. Tech. — 3 M.S. & Ph.D. — 2

### Sponsored Projects

- Design and Development of a Rarefied Gasdynamics Facility (ARDB)
- Design and Development of Ramjet Engine (ARDB)
- Hot Cascade Test Rig (ARDB)
- Development of a Reversed Flow Combustion Chamber



### **Staff Member Joined**

Dr. S. S. Gokhale, Assistant Professor.

### **New Major Equipment Added**

Instrumentation for Shock-tube facility.

### **Visitors to the Department**

- i) Prof. K. Karamchetti, Stanford University, U.S.A.
- ii) Prof. M. C. Bouriet, Universite de Poitiers, FRANCE.
- iii) Prof. L. F. Tsen, Universite de Poitiers, FRANCE.
- iv) Prof. Lallan, Universite de Lyon, FRANCE.
- v) Dr. K. S. Yajnik, National Aeronautical Lab, Bangalore.
- vi) Dr. J. Paulon, ONERA, FRANCE.
- vii) Dr. Jakuvouski, Virginia Polytechnic, U.S.A.
- viii) Astronaut, Charles Duke, U.S.A.

## **APPLIED MECHANICS (Including Bio-Engineering)**

### **Educational Programme**

Short Term Course on 'Bio-medical Engineering for service Engineers'.

### **Quality Improvement Programme**

	M.Tech.	M.S.	Ph.D.
Number on Rolls	1	---	2

### **Short Term Courses Conducted**

Winter School on 'Signature analysis and Diagnostic Maintenance'.

### **Important Lectures and Seminars**

- i) Electromyography Dr. Haridasan,  
Bombay.
- ii) Road Vehicle vibration Control and Suspension Design Prof. Seshadri Sankar,  
University of Concordia.

- |       |  |   |
|-------|--|---|
| iii)  | Numerical Technique for wave property, Scattering properties and Application | Dr. Varadan<br>Ohio State University<br>U.S.A.                        |
| iv)   | Modern Topics in the Area of Machinery Noise Control                         | Dr. M. J. Crocker,<br>University of Purdue,<br>U.S.A.                 |
| v)    | Role of Vibration and Sound Consultant in West Germany                       | Dr. N. Chandrasekhara,<br>GERB, West Germany.                         |
| vi)   | Biomechanics of Red Blood Cells  | Dr. Bipin Pai,<br>Purdue University, Calmut<br>U.S.A.                 |
| vii)  | Physiology of Kundalini  | Dr. K. N. Udupa,<br>Institute of Medical Science,<br>B. H. U. Varnasi |
| viii) | Muscle Physiology  | Dr. Anantharaman,<br>Basic Medical Sciences<br>Tharamani              |
| ix)   | Atherosclerosis  | Dr. Murugesan,<br>Kilpauk Medical College<br>Madras                   |

### Research Publication

Papers : 32

Book : 'Strength of Materials' by Dr. J. Ramachandran published by Scientific Book Agency - 1980.

### Departmental Projects

Sponsored 10.

### Assistance to Industry—Industrial Consultancy Centre

- i) Vibration measurement on continuous centrifugals and turbo-alternators for M/s Arooran Sugars Limited, Vadapathimangalam.
- ii) Earthquake withstand Test on 220 K. V. for M/s Transformers & Electrical Limited, Angamally, Kerala.
- iii) Performance Characteristics of SB dampers for M/s Indo-Asiatic Corporation, Calcutta.
- iv) Analysis of Transmission lines with dampers for M/s Indo-Asiatic Corporation, Calcutta.
- v) Vibration Test on capacity voltage Transformers for M/s W. S. Insulators of India Limited, Madras.

- vi) Fatigue Test on stockbridge dampers for M/s Best and Crompton Company, Madras.
- vii) Stresses on PCI units for M/s Dunlop India Limited, Madras
- viii) Seismic Test on isolators for M/s S & S Power Switchgear Limited, Porur, for M/s W. S. Insulators, Porur, and for Seshasayee Industries Limited, Vadalur.
- ix) Dynamic Stress Analysis of fans for M/s Ashok Leyland Ltd., Madras.
- x) Testing of torsional vibration dampers for their frequency for M/s Vibromech Instruments, Ltd., Guindy.
- xi) Stress Analysis Test for M. s. L & T M c Neil Ltd., Madras.
- xii) Measurement of Vibration on the R and D 'E' Mill for M/s ACC Vickers Babcock Ltd., Bombay.
- xiii) Experimental and theoretical static and Dynamic stress analysis of the standard mini-bus for M/s Standard Motors Products of India, Perungalathur.
- xiv) Computer analysis of the structural configuration of the Bahai's Temple, New Delhi for M/s E.C.C. Ltd., Madras.
- xv) Computer aided analysis of standard minibus-20 chasis and frame subjected to 'g' forces for Standard Motors Products of India, Perungalathur.
- xvi) Calibration and analysis of 'S' Probes for M/s Madras - Industrial Linings Ltd., Madras.
- xvii) Design, construction and wind tunnel testing of RCC Chimney model for Madhya Pradesh Electricity Board.
- xviii) Calibration of anemometers for M/s Electronics Equipments, Pune.
- xix) E. E. G. biofeedback system for SIRI Pharma, Vijayawada.

#### **New Major Equipment Added**

- i) Barograph for measurement of pressure distribution under the feet.
- ii) Portable muscle stimulator.
- iii) Bio-feed back equipments.
- iv) Ultrasonic mobility aids for blind.
- v) Flow visualisation tank.
- vi) Inverter.
- vii) Reflection polariscope.
- viii) Real time analyser.
- ix) Ultrasonic analyser parameters.
- x) Vibration analyser.

## **Visitors to the Department**

- i) Prof. Bernard Stewarding, United States Army.
- ii) Dr. Jan Erik Sigdell, Switzerland.
- iii) Prof. Henry Lalanne, France.

## **Invited Lectures delivered by the Staff**

- i) Roller bearings lubrication, failures and diagnostics at B. H. E. L. Hyderabad by Dr. B. V. A. Rao.
- ii) Mechanics of Roller bearings at B. H. E. L. Hyderabad by Dr. B. S. Prabhu.
- iii) Condition monitoring applied to paper Industry for N. P. C. by Dr. B. V. A. Rao.
- iv) Tribological failures relevant to paper Industry for N. P. C. by Dr. B. S. Prabhu.
- v) A keynote address at Seminar of 'Optimal maintenance' held at Bangalore Foreman Training Institute at Bangalore by Dr. B. V. A. Rao.
- vi) Theory of shells at B. H. E. L. Tiruchi by Dr. J. Ramachandran.
- vii) Theory of plates at B. H. E. L. Tiruchi by Dr. S. Venkatesan.
- viii) Biomedical Engineering at G. C. T. Coimbatore by Dr. T. M. Srinivasan.
- ix) Instrumentation in Bio-Engineering at Parasakthi College, Courtalam by Dr. T. M. Srinivasan.

## **Other Information**

Dr. K. Motiram Patil is at present on Humboldt Fellowship at Aachen on his Sabbatical Leave.

I. C. C. earnings has for the first time touched a figure of 3.6 lakhs.

## **Developmental programme in the near future**

- i) Short term course on Industrial Fluid Mechanics and Plastic Theory and Design of Structures.
- ii) New courses Fracture Mechanics and Maintenance Engineering and Management are planned for M. Tech and B. Tech.
- iii) An annual 6 to 8 weeks Refresher Course in Fluid Mechanics with special emphasis on Industrial application.
- iv) A new Fractural Mechanics Laboratory with special emphasis on fracture dynamics.
- v) Atmosphere boundary layer and its simulation in the laboratory.
- vi) Laboratory on Environmental Physiology.

# CHEMICAL ENGINEERING

## New Courses Introduced

### B. Tech

- a) Polymers and Rubber Technology
- b) Energy Technology
- c) Mineral Processing
- d) Bio-Chemical Engineering
- e) Corrosion Engineering
- f) Project Engineering
- g) Environmental Engineering
- h) Transport Phenomena
- j) Process Modelling
- k) Systems Engineering

### M. Tech.

- a) Catalytic Reaction Engineering (CRE)
- b) Environmental Pollution Control
- c) Process Modelling and Optimization
- d) Advances in Momentum Transfer
- e) Computer Aided Process Design
- f) Membrane Technology
- g) Aerosol Technology
- h) Compounding and Finishing Polymers
- j) Catalyst Technology
- k) Fertiliser Technology
- l) Coal Processing
- m) Petroleum and Petrochemicals
- n) Computer Process Control

### Changes made in Curriculum

The M. Tech. Curriculum has been changed to the credit system.

**Quality Improvement Programme/UGC Teacher Fellowship Programme  
Serving Teachers Programme**

	M. Tech.	M.S.	Ph.D.
Number of trainees so far	5	3	1
Number on Rolls in each of these Courses	...	...	4

**Important Lectures and Seminars**

Title	Speaker
The Chemical Engineering Profession Challenges ahead	Mr. P. K. N. Panikkar
Energy in the Indian Context	Dr. C. V. Seshadri
Energy Analysis in an Indian Village	Dr. C. V. Seshadri
Some Random Thoughts on Interaction with Industry	Dr. G. S. Laddha
Immobilisation of yeast for Alcohol production	Dr. C. Mutharesan
Computer Aided Design of Moulds	Dr. J. R. A. Pearson
Status of Fertilizer Industry in India	Mr. V. R. R. Gupta
Energy	Mr. K. T. Krishnamurthy

**Research and Development**

**Research Publications**

Papers published	9
Presented	5

**Books/Monographs**

- i) Air Pollution Control Equipment by Y. B. G. Varma & H. Brauer, Springer Verlag - 1981.
- ii) Process Control Laboratory Manual by P. R. Krishnaswamy, Ch. Durgaprasada Rao, C. Chandraprasad and V. S. Ramachandra Rao, C. D. C. Madras - 1981.
- iii) Chemical Engineering Economics & Decision Analysis - G. S. Davies, C. D. C. - 1981.

**Departmental Projects**

M.S.	12
Ph.D.	17

### **Assistance to Industry (I.C.C.)**

- |   |  |
|---|--|
| i) INRED Process Modelling                                | G. S. R. F., New Delhi                 |
| ii) Design of Absorber                                    | Toshniwal Hyvac, Madras                |
| iii) Standardization of Rigid Foam                        | M. s. Vadyar Boats, Madras             |
| iv) Design Consultancy                                    | MICO FARM Products, Madras             |
| v) Development of Manganese Based Chemicals               | C. P. Chemicals, Trivandrum            |
| vi) Degradation of Rubber Linings                         | Madras Industrial Linings Ltd., Madras |
| vii) Characterization of Expanded Polystyrene             | Mettur Beardsell, Madras               |
| viii) Characterization of Neoprene Rubber Bridge Bearings | Pioneer Rubber Industries, Madras      |
| ix) Performance Evaluation of Flow Meter                  | P. G. P. Instruments Ltd., Madras      |

### **Staff Members who joined the Department**

- |                       |     |           |
|-----------------------|-----|-----------|
| i) Dr. C. A. Sastry   | ... | Professor |
| ii) Dr. K. Krishnaiah | ... | Lecturer  |

### **New Major Equipments Added**

- i) Tensile Testing Machine
- ii) Bursting Strength Apparatus.
- iii) Microprocessor.

### **Fabricated**

- i) Vibration Mill 4 Ltr. Capacity
- ii) Spiral Fluidized Bed Drier
- iii) Plate Type Electrostatic separator
- iv) On line state and parameter estimation - software & hardware
- v) Tripper Plate Fluidized Bed Drier

### **Visitors to the Department**

- i) Prof. Heddon, T. V. Karlsruhe, West Germany
- ii) Prof. J. R. A. Pearson, Imperial College, United Kingdom
- iii) Prof. (Mrs.) Augustin, Frague, Poland

## Invited Lectures Delivered by the Staff

- |   |                    |
|---|--------------------|
| i) One Parameter Model for Granulation at the Indian Institute of Science, Bangalore                      | Dr. M. S. Ananth   |
| ii) Transport Phenomena at C. I. T., Coimbatore   | Dr. M. S. Ananth   |
| iii) Granulation at R. R. L., Hyderabad   | Dr. M. S. Ananth   |
| iv) Mixing in Polymer Processing at Seminar on Recent Developments in Plastics Engineering, Madras        | Dr. N. Subramanian |
| v) Fluidization Engineering, REC, Trichy  | Dr. N. Subramanian |
| vi) Bio-chemical Engineering, REC, Trichy   | Dr. N. Subramanian |
| vii) Reverse Osmosis Membranes at BARC Workshop on Desalination   | Dr. T. Gopichand   |
| viii) A short cut rating techniques for the design of heat exchangers at I. I. Sc., Bangalore             | Dr. T. Venkatram   |
| ix) Environmental Influence on Metallic Corrosion - Winter School on Surface Topography, I. I. T., Madras | Dr. T. Venkatram   |
| x) Desalination at A. I. R., Madras   | Dr. T. Venkatram   |
| xi) Decision Analysis - Short Term Course in Project Engineering at G. E. C., Trichur                     | Dr. G. S. Davies   |

## Brief Indication of Developmental Programme Likely to come up

- i) Computer Aided Process Design
- ii) Microprocessor Based Control Systems
- iii) Development and Processing of New polymers
- iv) Development of "Process Development and Design Laboratory and Installation"
- v) Development and Installation of Rapid and Accurate Analytical Techniques in the U. G. Reactor Laboratory
- vi) Environmental Engineering
- vii) Mineral process Engineering.



## CHEMISTRY

### New Courses Introduced

Two new courses have been introduced

- |                            |   |
|----------------------------|---|
| i) Biochemistry            | An introduction to Biochemistry with emphasis on the molecular basis of life processes. |
| ii) Computation techniques | A laboratory course on computer programming.  |
| New System/method added    | The new credit system was introduced at M. Sc. level in July 1980.                      |
| Changes made in Curriculum | The new syllabus for M. Sc., in Chemistry was introduced from July 1980.                |

### Quality Improvement Programme/UGC Teacher Fellowship Programme

- |                            |   |
|----------------------------|---|
| Serving Teachers Programme | Ph. D.  |
| No. of trainees so far     | 3 awarded Ph. D. and 3 have submitted their Thesis for award of Ph. D.      |
| No. on rolls in each.      | 1 QIP and 8 FIP Scholars are at present working for their doctoral degrees. |

### List of Important Visitors, Lectures and Seminars

Name	Organisation	Title of Lecture
i) Dr. Mrs. Rohatgi Mukherjee	Physical Chemistry Section Jadavpur University Calcutta	i) Creation and decay of excited species
		ii) Quenching of Fluorescence by excited state electron transfer reactions.
		iii) Photochemistry and model systems for solar energy conversions.
		iv) Sensitized Photo oxidation reactions through the intermediary of singlet oxygen.

ii)	Dr. D. Janiche	Director Institute for Bio-Chemistry University of Koln West Germany	Chemistry and Bio-Chemistry of Phenomones
iii)	Dr. David Patterson	Department of Colour Chemistry Leeds University U K	...
iv)	Dr. David Pattrodu	U K	Physico Chemical aspects of dyeing
v)	Dr. Richard T Walker	Department of Chemistry University of Birmingham, England.	...
vi)	Dr. (Mrs) Malini Ravi	University of Chicago	Interaction potentials for some sodium ion systems from measured total cross sections
vii)	Dr. J. M. Longo	Exxon Research Laboratories Linden, New Jersey, U.S.A.	Mixed Metal oxide Chemistry
viii)	Dr. K. H. Jack	Director Welfson Research group for High strength materials, University of New Castle, U K.	The crystal Chemistry of the Sialons.
ix)	Dr. S. R. Palit	Emeritus Professor, Indian Association for cultivation of Science, Jadavpur	Anomalous electro chemical migration
x)	Dr. H. Hoecker	Lehrstuhl Marrom Chemie University of Beyrouth West Germany	...
xi)	Dr. E. Eliel	Professor of Chemistry University of North Carolina Chapel Hill, USA	...

The II International Conference on Industrial and Oriented Basic Electro Chemistry was held during the 1st week of December 1980. Active help was rendered to the SAEST, in this connection.

A two-day symposium in Chemistry organised jointly by the Central Leather Research Institute, Madras and Chemistry Department Indian Institute of Technology, Madras was held on 7th and 8th March 1981. Seventy one papers covering various aspects of Chemistry were presented.

## Research and Development

Research projects funded by DST, CSIR, DAE, ISRO and others have been undertaken by the faculty of the department in various fields such as high polymer chemistry, water and air pollution, Synthetic organic chemistry, electro-chemistry, Photo-electro Chemistry, Structural and Theoretical Chemistry, Radiation and Photo-Chemistry, etc.

## Research Publications

About 90 papers have been published in National and International Journals.

## Books/Monographs

i) Monographs	Authors	Year of Publication
Amoxidation and Ammonolysis in Unit Operations in Industrial Organic reactions	Dr. S. R. Ramadas	1981 (In press)
ii) Book		
Principles of Co-ordination Chemistry-An experimental approach	Dr. D. Ramaswamy Dr. V. V. Ramanujam Dr. G. Aravamudan	1981 (In press)

## Patents

- i) Patents processed 'Synthesis of Condensed Nitrogen Heterocycles devised from Indan 1-3 dione.
- ii) Patent obtained with I P Nos. 102/Mas/80 dated 7-6-1980.

## Assistants to Industry ICC

- i) Spectral data such as IR, NMR, ESR, Far IR, UV, X Ray, SEM Atomic Adsorption, Fluorescence Spectroscopy etc. have been provided through RSIC to various Universities, Industries and Research Laboratories.
- ii) London Rubber Company, Pallavaram and Dhurangadhra were assisted in detection of ammonia in atmosphere, and complete analysis of beneficiated ilmenite respectively.
- iii) Bharath Heavy Electricals Limited were provided with Thermo-analytical data on coals.
- iv) Mass spectra were run for Universities, National Laboratories and Industries.

## Sponsored Projects

Twenty one projects sponsored by DST, CSIR, DAE, ISRO, etc. have been taken up.

## **Indo-German Projects**

Proposals for two Indo-German projects have been submitted.

### **FRP from pulp waste**

Submitted in collaboration with Dr. Nayar of FRP Centre. This Project envisages use of sulphite spent liquor from the paper pulp Industry. This liquor consists mainly of lignins and polyphenols. Attempts are to be made to cross link and polymerise these lignins. The semipolymerised viscous material is to be used as resin for FRP composite.

### **ii) Electrochemical studies with layered dichalcogenides**

In these studies Potentiostatic, linear sweep voltmetric, capacitance and photoelectrochemical techniques will be used. The objective is to develop efficient system for photoassisted electrolysis of water.

### **Any other Information**

Dr. (Mrs) K. Lalitha has joined the Department as Research Associate in Bio Chemistry.

Promotions : Dr. V. Ramakrishna has been promoted as Professor

Dr. D. V. Ramana has been promoted as Assistant Professor.

### **New Major equipment added**

A mini computer CROMEMCO SYSTEM II has been installed. This has FORTRAN and BASIC software facility and is being used for computerised work by faculty and research scholars.

### **New equipment fabricated**

- i) Micro spectrophotometer
- ii) Photo-electrical conductivity measurement unit of Photo catalytic reactions.
- iii) Continuous distillation unit for solvent purification
- iv) Potentiostat - Ramp generator
- v) Ion Selective electrodes for  $\text{Ag}^+$ ,  $\text{S}^-$ ,  $\text{CN}^-$  ions
- vi) Photo conductivity cell for surface reactions

### **Invited Lectures delivered by Staff**

Lecture	Name of Staff
i) Gardon Research Conference	
ii) Joint ISMAR-AMODRE International-Conference	

Lecture	Name of Staff
iii) Indian Institute of Science, Bangalore	
iv) Indian Institute of Technology Kanpur	Dr. P. T. Manoharan
v) TIFR Bombay	
vi) Universities in Zurach, Newyork City, Koln, Mainz, Berlin, Nijmeji	
vii) Loyolla College Current trends in surface characterisation	Dr. B. Viswanathan
viii) Inaugural Address of the Science Association of Meenakshi College	Dr. K. Narayanan
ix) Three day science seminar of AIR-15 min. talk in Tamil on 'Chemical Energy'	Dr. K. Narayanan
x) A course of lecture on Polymer chemistry to M.Sc students of Vivekananda College	Dr. V. Mahadevan
xi) Synthesis of Aromatic and Heteroaromatic Steroids, on 15th August at Loyolla College	Dr. S. R. Ramadas
xii) Synthesis of Natural Products starting from 5-membered hetero-cycles, Pachayapas College	Dr. S. R. Ramadas
xiii) New Approaches towards the Total synthesis of 12-thiasteroid with special reference to Sulphur induced $C^{13}$ -NMR shifts on gamma-anti-carbons	Dr. S. R. Ramadas
xiv) Delivered same lecture (S. No. 13) at the All India Chemists Convention at Bombay	Dr. S. R. Ramadas
xv) Spectroscopy at the Regional Engineering College Warangal	Dr. D. V. Ramana
xvi) Microanalytical chemistry of Selenium Conference on Microanalysis at Mysore.	Dr. G. Aravamudan
xvii) Hyderabad Chapter of the Catalysis society of India	Dr. J. Kuriacose
xviii) Waltair Chapter of the Indian Chemical Society	-do-
xix) 2 lectures at the Department of Chemical Engineering, Engineering College, Trichur	Dr. C. N. Pillai

### Future Development Programme

Two Projects have been submitted to DST for sanction of funds.

- i) **Energy** : This project concerns the electrochemical and hydrogen energies - production, storage, and utilisation.

- ii) **Catalysis :** To train the personnel in industry in the area of catalysis and to provide the necessary infra structure for such a training and to develop new catalysts and processes.

## CIVIL ENGINEERING

### New Courses Introduced

Additional elective courses have been introduced at the B. Tech. and M. Tech levels.

### New System/Method added

Credit pattern for B. Tech has been extended upto 8th semester. The M. Tech courses in the Department have been revised, updated and brought into credit pattern.

### Changes made in Curriculum

A revised and updated curriculum has been extended upto 8th Semester of B. Tech programme. The M. Tech programmes in the Department have been revised, updated and brought into credit pattern.

### Quality Improvement Programme

A Summer School was conducted on 'Recent Advances in Building Technology' during May 5-17, 1980 under the QIP for Teachers in Engineering Colleges and participants from Industry.

A course on 'Special Topics in Steel Design' was conducted under QIP during December 1980.

### Important Lectures and Seminars

	Title	Speaker
i)	Housing and Appropriate Technology	Mr. M Slingsby M. S. University, Baroda
ii)	Load Bearing Masonry	Prof. G. T. Suter Carleton University, Canada
iii)	Traffic Planning Models	Prof. William C. Taylor Michigan State University

### Research and Development

Research Publications

Papers 32

## **Book Monographs**

'Essentials of Bridge Engineering' by Dr. D. J. Victor,  
Third Edition : Oxford and IBH Publishing Co., New Delhi 1980

## **Departmental Projects**

M. Tech MS/Ph.D Projects were taken up as part of training programmes.

## **Assistance to Industry - ICC**

This Department has maintained and enhanced its efforts in giving assistance to various Government Departments and Industries.

## **Sponsored Projects**

Thirteen Projects were in progress during the year.

## **Invited Lectures Delivered by Staff**

Lectures	Staff
i) Shell Foundation	Dr. Nainan P. Kurian
ii) Traffic Safety Education	Dr. D. J. Victor
iii) Some Aspects of Bridge Construction	Dr. D. J. Victor

## **Proposed Development Programmes**

The Department has proposed the strengthening of the existing laboratory facilities and increase in the tempo of research and development.

The following areas are particularly chosen for further research:

- i) Construction materials and techniques
- ii) Housing Planning - design and building comfort
- iii) Environmental engineering
- iv) Ground Water Modelling
- v) Cyclonic Storm Surge
- vi) Simulation of river basins and reservoir operations
- vii) Shell and Special Foundations
- viii) Machine Foundations
- ix) Foundation on Clays
- x) Wind Engineering
- xi) Timber Structures

- xii) Optimization in Structural Design
- xiii) Integrated Transportation Planning
- xiv) Bridge Engineering and Transportation Structures
- xv) Traffic Studies
- xvi) Computer-aided design in Civil Engineering Systems

## COMPUTER SCIENCE

The Credit system for the M. Tech. Programme has been introduced and the M. Tech. (CS) curriculum has been revised. The new curriculum permits greater flexibility in the choice of electives and at the same time provides logical continuity through the semesters. New courses in several areas of Computer Science, viz., Algorithms, theory of computation, Data Base Systems, Computer Hardware and Systems Design, Digital Signal Processing etc., have been included in the new curriculum.

The Computer Centre now offers a course at the undergraduate level on principles of programming and Engineering applications.

### Education Programmes

- i) Continuing Education programmes offered:
  - a) COBOL Programming
  - b) Project Management System - Workshop
  - c) Data Base Management System - Workshop
- ii) At the invitation of TI cycles, Madras, the Computer Centre offered a course on 'Modern Computer System Concepts.'

### Important Lectures and Seminars

- i) R. Krithivasan, University of Utah, U S A (Computer Science Research Directions)
- ii) Dr. S. Srinivas, Bell Telephone Laboratories, Chicago, U S A (Experimental System for Integrated Voice and Communications)
- iii) Prof. Nivat, Centre for Programming, University of Paris, France (Recursive Program Schemes)
- iv) Prof. R. Narasimhan, Director, NCSDCT, Bombay (Research at NCSDCT)
- v) Prof. R. L. Kashyap, Purdue University, U S A (Syntactic Pattern Recognition)
- vi) Prof. Nakamura, Department of Applied Mathematics, Hiroshima University (Isometric array L-Systems)



- vii) Prof. Branco Soucek, University of Zagreb, Yugoslavia (Micro Computers and Interfaces)
- viii) S. Karunanidhi, System Analyst, Sydney, Australia (Opportunities in the Data Processing Profession)

### Research and Development

i) Research Publications	...	11
ii) Patents granted	...	2
iii) Departmental Projects	...	6

### Books Published

'Graphs, Networks and Algorithms', M.N.S.Swamy, Dean of Engineering, Concordia University, Montreal, Canada and K. Thulasiraman, Professor, Computer Centre, IIT, Madras, Wiley, Inter Science, February - 1981.

### Assistance to Industry

Project	Agency
i) Entrance Examination Processing for M B B S Course	CMC Vellore
ii) Linear Programming Model for Optimal Location for Cement Plants	Institute of Financial Management and Research
iii) Leprosy Treatment - Statistical Studies	SLRTI - CMC - Vellore
iv) Single Track Rail Simulation System	R D S O - Indian Railways
v) Project Monitoring and Management	Tuticorin Alkali Chemicals Ltd., and SPIC
vi) Personnel Information System	Tamil Nadu Electricity Board
vii) Statistical Studies	Tamil Nadu Nutrition Project
viii) Software Development for Computation of Illumination Levels for Flood Light Design for Large Areas	General Electric Company, Bombay
ix) Statistical Data Analysis for Survey Data	Clarion Advt. Co., Madras
x) System Analysis for Agriculture	Dept. of Agriculture Govt. of Tamil Nadu
xi) Computerised Hospital Information System	Dept. of Electronics Govt. of India
xii) Online enquiry Project	Dept. of Science and Technology, Govt. of India

## Invited Lectures Delivered by Staff

i)	Dr R Kalyanakrishnan	BHEL R & D	Computer Architecture
ii)	Dr R Kalyanakrishnan	BHEL	Computer Graphics
iii)	Dr Kamala Krithivasan	REC Trichy	Formal Languages and Automata
iv)	Dr Kamala Krithivasan	Sri Parasakthi College for Women Coutrallam	Introduction to Automata Theory
v)	Mr M K Ramanujam	College of Engineering, Guindy	File Organisation in COBOL
vi)	Mr V Aravamudhan	IFMR Madras	Software Systems for Financial Applications
vii)	Mr S Srinivasan	IDM Madras	Structured Design
viii)	Mr S Srinivasan	CMC Madras	Distributed Data Base Systems

## New Equipment

- i) Cromemco System based on Z.80 microprocessor
- ii) Hewlett Packard 9845 T desk top system with Graphic Display

## New Staff

The following have joined Computer Centre during 1980 - 81 :

- i) Dr B Yegnanarayana Professor
- ii) Dr K Kumar Subramaniam Asst Professor
- iii) Dr K B Lakshmanan Asst Professor
- iv) Mr S V Raghavan Systems Engineer (Operations)

## Future Plans

The Computer Centre is planning to expand the computer facility to meet the requirements for a large computing facility in the region. The proposed augmentation would provide for additional 1000 Mega bytes of online storage and 2 mega bytes of main storage.

# ELECTRICAL ENGINEERING

## Educational Programme

- i) Short term courses.
  - a) A two week course of 'Radar Systems' was organised under the Quality Improvement Programme during May-June 1980. Co-ordinator: Dr. K.P. Rajappan and Mr V. Subramanyam.
  - b) Three short term courses on 'Electromagnetic Interference/Compatibility' were conducted during June 1980 for the benefit of the various organisations in the country for a period of five weeks with the financial support of the Department of Electronics, Government of India. Co-Ordinator : Dr. T. A. R. Bhat.
- ii) Symposia, Workshop etc.
  - a) Workshop on 'Sponsored Projects in Power systems' was conducted during December 1980. Co-ordinator : Dr. A. Kuppurajulu.
  - b) 'International Symposium on Pollution performance of Insulators and Surge diverters' was held during February 1981.

Organised by : Dr. Y. Narayana Rao.

iii) Candidates under Quality Improvement Programme :

Ph. D. 12

M. Tech. 2

## Lectures delivered by invited speakers

	Title	Speaker
i)	Pattern Recognition	Dr. R. L. Kashyap Purdue University
ii)	Switched Mode Power supplies	Prof. A. Bopp Fachhochschule Fortwangen, W. Germany
iii)	Confinement of Electro-magnetic radiation to Aeither Bags	Dr. T. S. Shankara Dept. of Mathematics I. I. T., Madras
iv)	Observations of the artificial satellites and the earth science study	Dr. P. S. Dixit ISRO
v)	Sonar Receiver Design	Dr. P. V. Indiresan Director, I.I.T., Madras
vi)	Electrical Power System in Egypt	Dr. Y. Abed Mausonra University Egypt

- vii) Tanzania's Industrial Development and Faculty of Engineering      N. M. Ijumba  
University of Dar-Es-Salaam  
Tanzania
- viii) Switched Capacitor filter      Dr. A. Ganesan  
Bell Telephone Laboratory  
USA
- ix) Importance of EMI/EMC      Dr. D. R. J. White

### **Distinguished visitors to the Department**

- i) Honourable Minister V. P. Sathe, Minister for Information and Broadcasting, Government of India.
- ii) Prof. D. E. U. Ekong, Vice-Chancellor, University of Port Harcourt Nigeria.
- iii) Prof. A. O. Ewwaraya, Dean of Physical Sciences, University of Port Harcourt, Nigeria.
- iv) Dr. V. P. Kodali, Director, Department of Electronics, Government of India.
- v) Prof. R. L. Kashyap, Purdue University, USA.
- vi) Dr. A. Ganesan, Bell Telephone Laboratories, USA.
- vii) Prof. Mrs. M. M. Bodurova, Higher Institute for Mechanical and Electrical Engineering, Sofia, Bulgaria.
- viii) Dr. P. G. Popandopulo, Unesco Expert, University of Moiatua, Sri Lanka.
- ix) Dr. M. T. Thorn, Department of Electrical and Electronics Engineering, Huddersfield Polytechnic, U. K.

### **Research and Development**

- i) Number of Research papers published 1980-1981      25.
- ii) Major sponsored research schemes and projects under progress.
- a) 3 KVA PWM 100 Hz Inverter power supplies sponsored by W.S. Insulators Principal investigators : Dr. V. V. Sastry and Dr. P. Sasidhara Rao.
- b) Fields and Forces in HV Line Traps Sponsored by W. S. Insulators Principal Investigators : Dr S. S. Yegna Narayanan, Dr V. V. Bapeswara Rao and Dr. P. Sankaran.
- c) Study of cross core transformers and their application to EM pumps for large Fast Breeder Reactors Sponsored by Dept. of Atomic Energy Reactor Research Centre. Principal Investigator: Dr. S.S. Yegnanarayanan

- d) Development of Hardware and Software for computer aided power system Data Processing and Control. Sponsored by Dept. of Science and Technology. Principal Investigators : Dr. A. Kuppurajulu and Dr. S. Elangovan.
- e) Load Frequency control of power systems Sponsored by Energy Research Centre Principal Investigators: Dr. A. Kuppurajulu and Dr. C.V. Seshiah.
- f) Reduction of Transmission Losses and Feasibility study of computer aided load Despatch Centre. Sponsored by Tamil Nadu Electricity Board Principal Investigators : Dr. A. Kuppurajulu and Dr. S. Elangovan.
- g) Pollution performance of Insulating surfaces. Sponsored by W. S. Insulators Principal Investigators: Dr. Y. N. Rao and Mr. S. Gopal.
- h) Development of Ultrasensitive Pin Photodiode for Detection of very weak optical radiation. Sponsored by DST Principal Investigators : Dr. M. K. Achuthan and Dr. K. N. Bhat.
- i) Detection and Measurement of Air Pollution using Lasers Sponsored by DST (Dept. of Environments) Principal Investigator : Dr. M. Mukunda Rao.
- j) Research and Training for Fibre Optic communication system for Vijayanta Tank Sponsored by DRDO Principal Investigators : Dr. J. P. Raina and Dr. M. Mukunda Rao.
- k) Fibre Optical Communication. Sponsored by DRDO Principal Investigators : Dr. J. P. Raina, Dr. S. Srinivasan and Dr. M. Mukunda Rao.

### **Indo-German Collaboration**

- i) GHZ Microwave Communication System. Indian Co-ordinator : Dr. D. K. Banerjee.
- ii) Digital Image Processing. Indian Co-ordinators : Dr. J. P. Raina, Dr. S. Srinivasan and Mr. K. Palaniswamy.

### **Major consultancy Assignments**

- i) Measurement of power loss in transmission line equipment : Rural Electrification Corporation - Dr. V. V. Bapeswara Rao.
- ii) Design Optimization of transformers (63 KVA to 10 MVA): Transformers and Switchgears, Madras - Dr. V. V. Sastry, Dr. G. S. Rao and Dr. P. S. Rao.
- iii) Dr V. C. V. Pratapa Reddy is a consultant to Southern Magnetics.
- iv) Retainer Consultancy to Best and Crompton Company for one year given by Dr. V. V. Sastry.

## Major Laboratory Equipment added/fabricated

- i) CRT-Alpha Numeric Terminal for Display purposes - Power Systems Laboratory.
- ii) Micro 78 - Microprocessor System - Power Systems Lab.
- iii) PDP 11 Vo3 Minicomputer System - Power System Lab.
- iv) Frequency counter 500 MHz - Laser Communication Lab.
- v) Monitors B/W - T. V. Lab.

## Assistance to Industry

During the period July 1980 to March 1981, a total number of 39 assignments under ICC had been undertaken by the Department with a turnover of Rs. 2,04,410.

## Future Developments and Programmes

In order to introduce Microprocessor Education, it is proposed to provide a functional demonstration laboratory for Microprocessors to initiate the courses in Microprocessor area, with a special grant provided by the Ministry of Education, Government of India.

In addition, the following areas are to be developed :

- i) Microprocessor based instrumentation
- ii) Solar Cells
- iii) Power Electronics
- iv) Optical Communication

## HUMANITIES AND SOCIAL SCIENCES

<b>New Programme Introduced</b>	M. Tech. (Credit System)
<b>Changes made in curriculum</b>	M. Tech. Industrial Management
<b>New Courses Introduced</b>	(German Language Course (German IV for 8th Semester students and a conversation course in German Language)

## Serving Teachers Programme

	M. Tech.	M. S.	Ph. D.
No. on rolls in each of these courses	1	—	1

### Short term course conducted

- i) IIT - MMA - IAMM Certificate Course on Materials Management.
- ii) IIT - MMA Certificate Course on Manufacturing Management.
- iii) QIP Short Term Course on 'English for Science and Technology'.

### Research Publications

Papers 17

Books :

- i) East India Company and South Indian Economy by C. Ramachandran, New Era Publication, Madras 1980.
- ii) 'Capital Expenditure Decision and Cost of Capital' by Dr. L.V.L.N. Sarma, Readings in Management, Ed., Joshi and Kesary, Published by Wheeler and Co. (Pvt.) Ltd., 1980.
- iii) 'Impact of MBO on Managerial Job attitudes' by Dr. V. Anantaraman, Readings in Management, Ed. Joshi and Kesary, Published by Wheeler and Co., (Pvt.) Ltd., 1980.

### Assistance to Industry

Sponsored Projects : Two.  
(Number only)

Category of Staff joined : i) Associate Professors ... 1  
ii) Lecturers ... 2

New Major Equipment added : Language Laboratory is in the process of being set up.

Visitors to the Departments : Dr. Martin J. Beckmann visited the Department for two weeks and gave Lectures on Operations Research and Economics.

### Seminars conducted

- i) Dr. Enrico Cantore, Director, World Institute of Scientific Humanism, U. S. A., conducted a Seminar on Scientific Humanism.
- ii) A Seminar was conducted by Prof. Schmitt Rink from West Germany on Technology Transfer.

### Invited Lectures Delivered by the Staff

*Prof. R. K. Gupta*

- i) Keynote Address at the Annual Seminars on Commerce Educations Women's Polytechnic, Adyar

- ii) Development and Progress of small scale sector : Seminar on Future Impacts of Employment of Science and Technology, Graduates of PAUT, Madras
- iii) Business Policy : Regional Engineering College, Trichy

*Dr. V. Anantaraman*

- i) Motivation : SPIC, Madras
- ii) Effective Management : Institute of Public Relations and Management, Seminar on Public Relation, Ooty
- iii) Motivation : State Bank of India, Hyderabad
- iv) Motivation : Approach to Productivity, Hotel Chola Sheraton, Madras
- v) Office Management : Institute of Public Relations and Management Workshop, New Delhi
- vi) Motivational Technique : Hindustan Photo Film Ltd., Ooty
- vii) Supervisory Development : Royala Seema Paper Mills, Kurnool, A. P.
- viii) Industrial Democracy - A three tier participative system : State Institute of Commerce Education
- ix) 'Indian Industrial Relation System' : Federation of National Post and Telegraph Organisation, Seminar on Industrial Relations
- xi) Organisation Development : Hindustan Aeronautics Ltd., Bangalore

*Dr. S. Ramani*

- i) Value Engineering, Indian Institute of Packaging.
- ii) Corporate Planning and Management, Hindustan Copper Limited.
- iii) Decision Theory and Application, IIIE, Kerala Chapter.
- iv) Materials Management - National Thermal Power Corporation.
- v) Spare Parts Inventory Control - Administrative Staff College of India.
- vi) Industrial Engineering Techniques - Seshasayee Paper Mills.



- vii) Systems Analysis for International Institute for Applied Developing Countries - three Systems Analysis-Vienna (Organised by case studies. COSTED).
- viii) Organisations Under Stress An Approach. Lecture to faculty of the University of Texas at Arlington, USA.
- ix) System Approach to Problems of Development Lecture to Sri Lanka Officials at Colombo under the auspices of COSTED.
- x) Principles of Optimum Maintenance Howard Finley Corporation

*Dr. L. V. L. N. Sarma*

- i) Capital Structure and Cost Capital Dept. of Management Studies, University of Madras.
- ii) Two Lectures to the faculty and students of MBA Programme of Nagarjuna University, Nagarjuna Nagar.

*Dr. V. Arumugam*

- i) Value Analysis : Madras Management Association.
- ii) Production Management : Madras Management Association and Hindustan Institute of Engg. Technology

*Mr. V. S. Kumar*

Technical Report Writing : National Productivity Council, Madras

### **Faculty Promotion and Additions**

- i) Dr. A. V. Krishna Rao and Dr. L. V. L. N. Sarma promoted as Associate Professors and Dr. C. Ramachandran promoted as Assistant Professor.
- ii) Dr. Ambirajan appointed as Professor in Economics.
- iii) Dr. Dipak Chaudhuri appointed as Associate Professor in Industrial Engineering.
- iv) Dr. Rita Ghatak appointed as Lecturer in Psychology.
- v) Mr. Mukesh Williams appointed as Lecturer in English.

### **Placement**

No. of contacts by Industry for the period : about 100

No. of candidates placed : about 30

## **MATHEMATICS**

### **New System**

A System of Faculty advisers for the M.Sc. students was introduced for the new 1 year M.Sc. students

## Changes made in Curriculum

Consequent on the change over of the B. Tech. course from 5-year to 4-year stream, the Mathematics curriculum was revised. The core courses are now spread over the first 3 semesters with a 'O' level course in the beginning for low-scorers in the Joint Entrance Examination. The electives for the B. Tech. and M. Tech. and M.Sc. were also streamlined.

## U G C Teacher - fellowship programme

	Ph.D.
No. of fellowships	6

## Important Lectures and Seminars

The Department conducts weekly seminars by local and visiting faculty members and Ph.D. seminar—talks by Research Scholars. The following lectures were given by visiting scientists :

Title	Speaker
i) Existence of solutions of Hyperbolic problems I, II	Prof. R. Kannan University of Texas Arlington
ii) Approximation for Cauchy-Problem of incompressible Fluid Mechanics	Prof. R. Rautmann, Technische Hochschule Paderborn, W. Germany
iii) Error estimates for spectral approximation of non-Stationary Navier-Stokes solutions	-do-
iv) Bifurcation in Elastic/Plastic Solids	Prof. R. N. Dubay, University of Waterloo, Canada
v) Variational Methods for Non-conservative problems	-do-
vi) Homological Methods	Prof. M. Ramabhadran, University P. G. Centre, Tiruchirapalli
vii) Unification of Fundamental forces of nature	Prof. S. P. Misra Institute of Physics, Bhubaneswar

- |   |   |
|---|---|
| viii) The N/G I Queue and its detailed analysis | Prof. V. Ramaswamy<br>Drexel University,<br>Drexel, U. S. A.      |
| ix) Symmetries                                  | Prof. C. J. Elizer<br>La Trobe University<br>Victoria, Australia. |
| x) Some Problems in Complex Analysis            | Dr. Parvatham<br>Ramanujam Institute,<br>Madras                   |

### Papers

Total numbers published in journals : 39

Departmental Projects : 2 (1 CSIR and 1 UGC)

### Any other Information

Dr. V. B. Johri joined as Associate Professor.

Dr. R. Subramanian joined as Professor.

Dr. S. N. Majhi and Dr. P. R. Parthasarathy joined as Assistant Professors.

Some of the faculty members are serving on the Boards of Studies, Selection Committees and Examining Bodies of various Universities and Technological Institutions.

Some of the Faculty members serve on the Boards of Referees of research papers of reputed journals. A few faculty members review research papers for review journals like Mathematical Reviews, (Michigan, USA), Zentralblatt, (Berlin).

### Visitors

- i) Prof. P. K. Ghosh.  
University College of Science, Calcutta.
- ii) Prof. M. Venkataraman,  
Dean, School of Mathematics, University of Hyderabad.
- iii) Dr. K. Kanakaraju, Engineer, VSSC, Trivandrum.

### Invited lectures delivered by the staff

Lecture	Name of the Staff
i) Unification of Elementary particles and Fundamental Forces (Calicut University)	Dr. P. Achuthan
ii) Pomeron in the New Light (HEPConference, Cochin University)	

- iii) Pair Creation in inhomogeneous Magnetic Fields (HEP Conference, Cochin University) Dr. P. Achuthan
- iv) Pauli-Conscience Keeper of Physics (Matscience)
- v) Relativity of Space-like Motion (Regional College of Education, Mysore)
- vi) Impact of Science on Man (Theosophical Society, Madras)
- vii) On Space, Time and Casuality (Peradenia University, Sri Lanka) Dr. T. S. Shankara
- viii) Relativity for the layman (Royal College, Colombo)
- ix) Survival Analysis (Madras University) Dr. P. R. Parthasarathy

### Conference attended

Name of the Faculty Member	Name of the Conference and other details
i) Prof. K. M. Das	International Conference on 'Non-linear Phenomena in Mathematical Sciences, University of Texas, Arlington, U S A (June 1980). Invited talk on 'On F Points Multivalued Maps'.
ii) Prof. S. D. Nigam	Silver Jubilee Congress of ISTAM, Kharagpur (Dec. 1980)
iii) Prof. H. S. Paul	Presided over a Technical Session of the Silver Jubilee Congress of ISTAM, Kharagpur (Dec. 1980)
iv) Dr. C. V. Raghava Rao	International Conference at the College of Trinity (June 1980), Dublin (Ireland) and presented a paper 'Numerical studies of Stokes flow past a sphere'.
v) Dr. S. N. Venkatarangan	International Conference on Nonlinear Mechanics at Kharagpur (Dec. 1980) Presented two papers : Pade approximation to Singular perturbation problems in Fluid Mechanics' and 'Pade Approximation applied to Lighthill's Model differential equation.'
vi) Dr. S. N. Majhi	Paper read at ISTAM Congress (Dec. 80) Kharagpur - 'Parabolic Viscous flow past a cylinder'.

Prof. R. Subramanian spent a month at the Kerala University, Trivandrum under the UGC Scheme and gave lectures on 'Probability Theory and Stochastic Processes' to the faculty of the University.

Under the programme of Inter-Institutional Collaboration between I. I. T. Madras and the University of Peradeniya, Sri Lanka, the following staff members of the Department spent a period of 40-45 days at the University, delivering special lectures to the Engineering students.

- i) Dr. P. Bhattacharyya, Assistant Professor.
- ii) Dr. T. S. Shankara, Assistant Professor.
- iii) Dr. S. N. Venkatarangan, Lecturer.

Dr. L. V. K. V. Sarma left on a 2-year assignment to join the Institute De Technology, Algiers, Algeria, in September 1980.

### **Journal of Mathematical and Physical Sciences**

The Journal of Mathematical and Physical Sciences, a research journal, international in character and published by the Department, continues to attract good quality research papers and review articles. So far 14 volumes have been published. Under the mutual exchange of publication programme initiated by the Department, we are receiving several international research journals from abroad.

### **Future Developmental Programmes**

- i) An international conference on 'Recent Advances in Nonlinear Analysis and Differential Equations' is proposed to be conducted in the Department during December, 1981.
- ii) Proposals for the conduct of short-term state of art seminars are under consideration.
- iii) A new scheme of visit by junior faculty members and post-graduate students to Industry and allied Institutions like TISRO, to explore the possibility of promoting mutually beneficial projects is under consideration.
- iv) The programme of Inter-Institutional collaboration between IIT Madras and the University of Peradeniya, Colombo is being continued with the visit of the following faculty :
  - a) Dr. (Mrs.) S. Kalpakam
  - b) Dr. A. Avudainayagam

# MECHANICAL ENGINEERING

## Thermodynamics and Combustion Engineering Laboratory

- New Courses introduced
- i) Utilisation of Solar Energy- 9th Semester Elective—B Tech.
  - ii) Non-conventional Energy sources—10th semester Elective—B. Tech.
  - iii) Combustion Technology—II M. Tech.

## Educational Programme - Continuing Educational Programme

Short Term/Part time courses conducted - Quality Improvement programme/UGC Teachers Fellowship programme.

	M. Tech.	M. S.	Ph. D.
No. of trainees so far for	...	...	5
No. on rolls	...	...	...
Short term courses conducted	...	...	...

## Sponsored Projects

A project sponsored by AR and DB initiated last year is being continued. One of the objectives namely of proposing a theoretical model for evaluating the performance of a rocket ramjet engine has been accomplished. The second phase of the work dealing with detailed measurements in such engines has commenced. Fabrication of the test set-up and design of experiments are in progress.

## Any other Information

The laboratory is pursuing research areas in combustion engineering and some of the topics currently receiving attention are: Shock Tube Technique and Combustion Kinetics, Turbulent Combustion and Spray Combustion. Combustion in swirling flows. The mechanism of ethanol combustion is being investigated and this subject is of profound interest in the present day energy crisis. Similarly turbulent combustion and spray combustion are also of practical interest as the results of these investigations should find immediate applications.

Two of the faculty, (Dr. Shet and Prof. Gupta) participated in the 18th Symposium (International) combustion held at Waterloo, Canada in August 1980. They presented the paper entitled "A new approach to the correlation of Turbulent Burning Velocity Data".

Dr. Shet and Dr. Sriramulu participated in the International Symposium on Flow Visualization held at Bordeaux, West Germany and presented papers.

## **Brief Indication and Developmental Programme likely to come up**

Encouraged by the success achieved so far in the AR and DB project pertaining to rocket ramjet engine, it is proposed to incorporate sophistications in the theoretical model besides carrying out detailed experimental investigations. It is hoped to extend the tenure of the project and obtain further grant to enable the laboratory to meet this objective.

The subject of coal and wood combustion has not received much attention so far and it is felt that the need for it is growing rapidly. It is proposed to initiate, however modest it is, work in this direction before long.

## **Fine Technics Laboratory**

### **On Course**

New courses introduced: The following new elective courses have been introduced for the I. M. Tech. Class in Mechanical Engineering (Fine Technics elective) :

- i) ME 655 - Inertial Instrumentation.
- ii) ME 657 - Manufacturing methods in Precision Engineering.
- iii) ME 696 - Measurement of Mechanical Quantities.

## **Changes made in curriculum**

The M. Tech. programme has been recast on credit system basis with a number of elective courses choice for the students.

## **Quality Improvement Programme/UGC Teacher Fellowship Programme**

Serving Teachers Programme	M. Tech.	M. S.	Ph. D.
No. of trainees so far	4	...	...
No. on rolls in each of these courses	...	...	1

## **Research and Development**

Research Publications :

Papers - Total numbers published in Journals : 2

Departmental Projects : 1

## **Assistance to Industry - ICC**

- i) Tool Maker's Microscope (NRDC Project)
- ii) Consultancy on sand cooling system in foundry for Ennore Foundries Limited, Madras.

## **Sponsored Projects**

- i) Optical head for T. V. Tracker - Aero R and D.
- ii) Laser illuminated for beam riding guidance - Aero R and D.

## **New major equipment added**

Automatic centering and edging machine (procured under sponsored project)

Fabricated : Laser Interferometer.

## **Heat Transfer and Thermal Power Laboratory**

### **Education Programmes**

- 1) Quality Improvement Programme/UGC Teacher Fellowship Programme :  
Serving Teachers Programme :

No. trained so far for M. Tech., M. S. and Ph. D. : Nil

No. on rolls in each of these courses : M. S. : —

Ph.D. : 1

## **Research and Development**

### **Research Publications**

- i) Papers Published ... 3
- ii) Sponsored research schemes and Projects :  
DST project on 'Optimal Layout of Tube Bundles in Fluidised Bed Steam Generators'
- iii) Assistance to industry - ICC
  - a) Calibration of Temperature indicators
  - b) Determination of Thermal conductivity of insulating and building materials'
  - c) Design of heat exchanger for air borne electronic equipment.
- iv) Invited lectures delivered by the staff
  - i) Dr. K. N. Seetharamu delivered lectures at the University of Peradeniya, Sri Lanka as short term expert under Colombo Plan during the months of October - November 1980.
  - ii) Dr. K. N. Seetharamu delivered a series of lectures on 'Finite Element Methods in Heat Transfer and Fluid Mechanics' at the Regional Engineering College, Warangal during March 1981.
  - iii) Dr. K. N. Seetharamu delivered lectures on short cut Methods to Heat Exchangers at the Summer School held at Engineering College, Ananthapur during May 1980.



A brief indication of developmental programme likely to come up :

- i) Fluidized Bed operations
- ii) Solar Drying
- iii) Thermal Energy Storage
- iv) Heat transfer in rotating electrical machines
- v) Boiling Heat Transfer and two phase flow
- vi) Applications of finite element methods to Heat Transfer problems.

### Hydroturbomachines Laboratory

New Courses introduced : For B. Tech. (Mech.)

- i) ME 563 Hydroturbomachines Application Engineering
- ii) ME 565 Pump Application Engineering
- iii) ME 566 Design of Hydroturbomachine Elements
- iv) ME 568 Fluid Mechanics of Turbomachines

New System/method added : Credit system in M. Tech. course has been introduced.

### Quality Improvement Programme/UGC Teacher Fellowship Programme

Serving Teachers Programme :

	M. Tech.	M. S.	Ph. D.
No. of trained so far for	3	...	...
No. on rolls in each of these courses	...	...	1

### Important Lectures and Seminars

Title	Speaker
i) Large amplitude convection in a rotating fluid saturated porous layer	Prof. Dr. Ing. Friedrich Professor of Fluid Mechanics Technical University Munich
ii) Direct numerical simulation of two-dimensional turbulent boundary layers using a subgrid scale model	-do-

### Research and Development

This Laboratory is currently involved in the following research projects :

- i) Cavitation studies in radial pumps
- ii) Optimization of jet pumps

- iii) Measurement of unsteady flow in hydroturbomachines
- iv) Development of multiple disc friction pump
- v) Study of the influence of splitter vanes on the performance of radial pumps

This laboratory is also involved in the development of hydraulic machinery for tapping alternative energy resources in our country with the following two projects.

#### **i) Reversible machines for tidal power**

This laboratory has developed a working model of a fully reversible axial pump-turbine for use in tidal power plants. Having ascertained the best possible blade profiles for such special purpose machines, more aerodynamic data necessary for the design have been determined by wind tunnel and cascade studies.

#### **ii) Hydroturbines for micro-hydropower plants**

This laboratory is developing tubular and bulb turbines that could be used in very low head installations such as canal drops etc.

#### **Research publications**

Papers - Total numbers published in journals : 4

Books/monographs - 1

Department Projects - 6

#### **Assistance to Industry - ICC**

One project for BHEL, Bhopal for the development of Bulb Turbine is in progress.

Sponsored Projects - 'Design and development of multipurpose reversible axial flow machines' - sponsored by Department of Science and Technology.

#### **Visitors to the Department**

- i) Dr. Friedrich, Professor, Institute for Fluid Mechanics, T. U. Munich, West Germany.
- ii) Dr. G. Neumann, Director, German Academic Exchange Service.
- iii) Mr. R. Nagaraja, Product Manager, Tungabhadra Steel Products, Tungabhadra Dam.

## **I. C. Engines Laboratory**

### **Quality Improvement Programme/UGC Teacher Fellowship Programme**

Serving Teachers Programme :	M.Tech.	M.S.	Ph.D.
No. of trainees so far for	—	—	6
No. on rolls in each of these courses	—	—	3

### **Important Lectures and Seminars**

Title	Speaker
Research and Development	Prof. M. K. Gajendrababu Dept. of Mechanical Engineering Indian Institute of Technology New Delhi

### **Research Publications**

Papers - Total numbers published in journals - 15

Books/monograph - Title - Authors - Publicity year.

### **Assistance to industry - ICC**

Consultancy work on Agro Engines for type certification (ISc.)

### **Sponsored Projects**

Indo-US (NSF) Project in progress on Combustion of Alcohol and Biogas.

### **Brief indication and developmental programme**

Work is under progress to convert a S. I. engine to run on biogas for pumping water. It is intended to find the % derating to run the engine on biogas.

It is proposed to start a stratified charge alcohol engine. Also proposals are under way to find the species concentration using Raman Laser spectrometer. This will give a real insight on the combustion process in an working engine.

### **Staff**

Two Lecturers have been promoted to the post of Assistant Professor.

### **Machines Elements Laboratory**

New Courses introduced :

853 Sintered Friction and antifriction materials. 854 Friction and Water consideration in design

New System/method added :

Credit system introduced.

## Quality Improvement Programme/UGC Teacher Fellowship Programme

### Serving Teachers Programme :

	M. Tech.	M. S.	Ph. D.
No. of Trainees (Cumulative)	8	—	6
No. on rolls in each of these courses	1	—	3

## Research and Development

### Research Publications

Papers - Total numbers published in Journals ... 15

### Assistance to Industry - ICC

- i) Analysis of coupling shrink fit failures in a Diesel locomotive BHEL Bhopal/RDSO Lucknow.
- ii) Machining of a special tapered screw for Polyene Industries.
- iii) Correction of defects in dies for Polyene Industries.
- iv) Frame assembly Machine Development for TI Cycles (under progress)

New major equipment added: Carburizing furnace, bending, fatigue tests stand, Carbon sulphur apparatus.

### Visitors to the Department

Prof. Dr. Ing. G. Bechtloff  
Hochschule der Bundeswehr  
Hamburg, August-September 1980

### Invited lectures delivered by the staff

Lecture	Name of Staff
i) Optimum design of Gear Blanks delivered at Hochschule der Bundeswehr, Hamburg, West Germany November 1980.	Dr. A. Ramamohan Rao
ii) Rolling contact fatigue behaviour of tuff-trided surfaces Summary of research at I. I. T. Madras and HSBW Hamburg delivered at Hochschule der Bundeswehr, Hamburg, West Germany November 1980	Dr. A. Ramamohana Rao
iii) Research in Design to help industry delivered at Institution of Engineers, Colombo, Sri Lanka, March 1981.	Dr. A. Ramamohana Rao

## Deputation

- i) Dr. A. Ramamohana Rao, DAAD Short term re-invitation Programme to Germany August-November 1980.
- ii) Dr. A. Ramamohana Rao, Colombo Plan short term experts to teach a Peradenia University, Sri Lanka, February-March 1981.

## Mechanical Handling Laboratory

### Educational Programme/Continuing Education Programme

Short term course on Oil Hydraulics - drives and control has been conducted for the Engineering personnel of M/s. Ennore Foundries in July 1980.

### Quality Improvement Programme/UGC Teacher Fellowship Programme

Serving teachers programme :

	M.Tech.	M.S.	Ph.D.
No. of trainees so far	4	—	—
No. on rolls in each of the courses	—	—	1
Short term courses conducted	—	—	—

## Important Lectures and Seminars

Title	Speaker
i) Material Handling in ports	Prof. Dr. Ing. G. Bechtloff Hochschule der Bundeswehr Hamburg
ii) Design of structures using KRASTA dynamic analysis of cranes (2 lectures)	Prof. Dr. Ing. R. Neugebauer Technische Hochschule DARMSTADT

## Research Publications

Papers published	...	2 in Journals
	...	3 in ISTAM Proceedings
Books/Monograph	...	A text book on Materials Handling is under preparation under UGC grant

## Patents

Patents processed	...	1
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## **Assistance to Industry - I. C. C.**

- i) Design of handling systems for crest gates for TWAD
- ii) Design of Belt conveyors for Prabhakar Products
- iii) Design of purchases for Pharmadynamic
- iv) Computer aided design of Belt Pulleys for Elecon (progressing)
- v) Checking of design specifications for Materials Handling system for E. T. I. Ltd., Calcutta
- vi) Handling of plates and coils for Mps. T. P. I. Avadi
- vii) Mechanisation of cycle frame soldering for T. I. Cycles, Ambattur (progressing)
- viii) Testing of jib crane for Swastik Engg. Guindy

## **Sponsored Projects**

D. S. T. Project on 'Pneumatic Conveyance with high concentrations was started in June 1980.

**Fabricated :** Test stand for belt conveyor idler friction was fabricated as a part of M. Tech. project.

## **Visitors to the Department**

- i) Prof. Dr. Ing. G. Bechtloff, Hochschule der Bundeswehr, Hamburg.
- ii) Prof. Dr. Ing. R. Neugebauer, Technische Hochschule, Darmstadt.

## **Invited Lectures delivered by the Faculty**

Lecture	Name of the Faculty
Two lectures on stacking and Reclaiming of Bulk Materials, at Winter School, Gwalior	Prof. M. A. Parameswaran

## **Brief indications of development programme likely to come up in the near future**

Under the DST project in progress, Pilot facilities for pneumatic conveying at a very high concentrations will be ready within another two years.

## **Production Engineering and Machine Tools Section**

New Programmes introduced: DIIT Aircraft production reintroduced.  
New System/method added: B. Tech. M. Tech. and DIIT courses in Credit System.

## **Educational Programme - Continuing Education Programme**

- Short Term: i) XV and XVI HAL Process Engineers Course for HAL, BEML and Instrumentation Divisions.
- ii) Short Term Course on Surface Topography and Integrity in Engineering held during November - December 1980 for Engineers from Industry.

## **Quality Improvement Programme/UGC Teacher Fellowship Programme**

### **Serving Teachers Programme :**

	M. Tech.	Ph. D.
No. of Trainees so far	12	2
No. on rolls in each of these courses	1	4
Short term courses conducted	- N I L -	

## **Important Lectures and Seminars**

Title	Speaker
N. C. Machines	F. Stride, United Kingdom Scientist

## **Research and Development**

### **Research Publications**

Papers—Total numbers published in journals	...	30
Books (Monographs)	...	1 (under print)

### **Patents**

Patents Processed	...	3
Patents obtained with I. P. Nos.	...	1
Departmental Projects	...	1 (DST) Project

## **Assistance to Industry - ICC**

- i) Torque Test and Vibration Test for self locking nuts for Trustwell Industries, Madras-10
- ii) Preparation of Status Report on Cutting Tool Industry in Tamil Nadu and Pondicherry for Small Industries Service Institute, Ministry of Industry, Government of India, Madras-32.

### **Any other Information**

One Assistant Professor has joined in the Production Engineering and Machine Tools Section, Department of Mechanical Engineering.

### **New major equipment added**

- i) Hetrodyne Analyser.
- ii) Force Transducers.
- iii) Exciter control.
- iv) Power Amplifier.
- v) Vibration Exciter.
- vi) Portable Perthometer.
- vii) Light Section Microscope.
- viii) Perithometer with digital readout and printer.
- ix) Digital Readouts.

Fabricated: Anechoic Chamber.

### **Visitors to the Department**

Mr F. Stride  
Scientist, United Kingdom

### **Invited Lectures delivered by the staff**

Lecture	Name of Staff
Peradeniya University	Dr. S. Rajesham
Sri Lanka - 5 week	Lecturer

### **Any other Information**

- i) The National Research Development Corporation of India, New Delhi has awarded certificate of Merit to Dr. V. C. Venkatesh and Dr. G. Kuppuswamy for using the 'beneficial effect of magnetic field on electrochemical grinding'.
- ii) Dr. R. Krishnamurthy, Assistant Professor has been invited to contribute a technical article on 'Surface Durability of Gears' by the Technische Akademik Esslingen, West Germany to the year book of Tribology.
- iii) Professor V. Radhakrishnan has been retained as the rapporteur from India for the Second International Conference on Metrology and Properties of Engineering Surfaces to be held in United Kingdom in 1982.



## **Brief indication and Developmental Programmes likely to come up**

Further research work is contemplated in areas of Metal Cutting, Abrasive Machining, Unconventional Machining, Gear Tribology and Surface Topography and Integrity studies.

Proposed to conduct Industry based short-term courses for practising engineers.

## **Refrigeration and Airconditioning Laboratory**

New System/method added: Credit system for M. Tech. Course

## **Quality Improvement Programme/UGC Teacher Fellowship Programme**

Serving Teachers Programme:

	M. Tech.	Ph. D.
No. of trainees so far for	4	4
No on rolls in each of these courses	—	2
Short Term Courses conducted	- NIL -	

## **Important Lectures and Seminars**

Title	Speaker
i) Two phase flows	Prof. R. V. Smith
ii) Technology Assessment	Wichita State University (USA)

## **Research and Development**

### **Research Publications**

Papers - Total numbers published in journals ... 2

## **Assistance to Industry - ICC**

- i) Central Airconditioning of Main Laboratory.
- ii) Central Electrochemical Research Institute, Karaikudi.

## **Sponsored Projects**

- i) Solar Boosted Heat Pump Systems - DST.
- ii) Integrated Energy Systems for Dairies in Rural India - DST.
- iii) 10 K W Solar Power Plant - Indo-German Project - DST.

- iv) Design and Development of Optimum continuous Refrigeration and Airconditioning System - Indo-Australian Project - DST.
- v) Utilisation of Solar Energy for Cold storage of Food Products - IIT. DAAD Indo-German Project.

#### **New major equipment added/Fabricated**

- i) Solar Boosted Heat Pump systems of vapour compression type with R 11 and R 114 for industrial applications.
- ii) Solar Boosted Heat Pump/refrigeration system of vapour absorption type with R 22 DMF for space heating/cooling.

#### **Visitors to the Department**

- i) Lt. Gen. A. M. Sethna, Vice Chief of Army Staff.
- ii) Dr. Ricardo Pama, Vice President, AIT, Bangkok.
- iii) Shri G. K. Chandiramani, Chairman, IISc., Bangalore.
- iv) Mrs. Pierret Polmowski, UNESCO.
- v) Air Vice Marshall V. S. Narayanan, Director DRDL, Hyderabad.
- vi) Yugoslav Delegation of Energy Scientists.
- vii) German Press Delegation.
- viii) Soviet Delegation of Energy Scientists.

#### **Invited Lectures delivered by the staff**

Lecture	Name of staff
i) Solar Refrigeration	Prof. M. V. Krishna Murthy
ii) Freeze drying of Food Products - Summer School on Design of Cold Storages, JNTU, Ananthapur (May 1980)	Dr. S. Srinivasa Murthy
iii) Solar Assisted Refrigeration and Heat Pump Systems ISTE Summer School on Industrial Refrigeration and Airconditioning (May 1980)	Prof. M. V. Krishna Murthy

#### **Thermal Turbomachines Laboratory**

##### **New Courses introduced:**

Marine Power Plants (for B. Tech. Naval Arch. 1980-81)  
Ship Machinery (1981-82)

### **Changes made in curriculum :**

Credit system is introduced for M. Tech. Thermal Sciences.

### **Continuing Education Programme :**

Short Term Course on 'Mechanical Design Aspects of Turbomachines'—  
December 1 - 12, 1980 for Industrial personnel.

### **Quality Improvement Programme :**

Serving Teachers Programme :

	M. Tech.	Ph. D.
No. of trainees so far (1979-80)	3	2
No. on rolls in each of these courses (1980-81)	1	2

### **Short Term Course conducted :**

Short Term Course on 'Mechanical Design Aspects of Turbomachines'—  
July 9 - 12, 1980 for Engineering College Teachers—No. of Participants ... 18.

### **Research and Development :**

A Test set-up for study of surge characteristics of Centrifugal Compressors  
is commissioned.

### **Research Publications :**

Papers - Total numbers published in journals ... 2

### **Assistance to Industry - ICC :**

Carried out consultancy work for different organisations :

- i) Design of axial cooling fans for electrical machines for Jyothi Limited, Baroda.
- ii) Design guidance. Testing of LP exhaust hard of a steam turbine-BHEL, R & D, Hyderabad.
- iii) Design fabrication of turbine blades - BHEL, R & D Hyderabad.
- iv) Consultancy - Flow distribution in radial ventilated channels of electrical machines - BHEL, R & D Hyderabad.

### **Sponsored Projects**

- i) ARDB Project - High Speed Cascades.
- ii) ARDB Project - High Speed Centrifugal compressors.

- iii) DST Project - Centrifugal Compressors - Surge Control.
- iv) DST Project - Advanced Research in Centrifugal Turbomachinery.
- v) Indo-German Project - Energy-Centrifugal Compressor.

First phase 3 years completed - Extension recommended by the Review Committee for a further period of 3 years.

**Additional space/Laboratory etc. provided :**

Extension building for Thermal Turbomachines Laboratory is completed for the advanced research.

**New Major equipment added :**

Laser Doppler Anemometer, Real Time Spectrum Analyser, Wireless Data Coupling System.

**Visitors to the Department :**

- i) Prof. Tabakoff, University of Cincinnati, Ohio, U.S.A.
- ii) Prof. F. Sisto, Stevens Institute of Technology. U.S.A.

**Invited Lectures delivered by the staff :**

- i) 1980 September - Lectures were delivered by Dr. B. Prithvi Raj and Dr. N. Venkatrayulu at BHEL, R & D, Hyderabad on 'Unified Theory of Turbomachines'.
- ii) Dr. N. Venkatrayulu - visited University of Peradenia, Sri Lanka for 5 weeks during January-February 1981 to deliver lectures on Fluid Mechanics of Axial Compressors.

A brief indication and Developmental Programme likely to come up :

- i) A test set up for high speed centrifugal compressor will be erected in the Laboratory extension building for advanced research as a part of Advanced Research in Centrifugal Turbo-machinery - DST Project.
- ii) Development of a compressor impeller suitable for a turbo-charger and the test stand will be housed in the new extension building.

## METALLURGY

New System/method added: Credit System for B. Tech. and M. Tech. Courses

Changes made in curriculum B. Tech. and M. Tech. curriculum changed to suit the credit system

## Quality Improvement Programme / UGC Teacher Fellowship Programme

### Serving Teachers Programme

	M. Tech.	Ph. D.
No. of trainees so far for	---	—
No. on rolls in each of these courses	—	2

### Short Term Courses

The following courses were organised / sponsored by the I. I. T. Madras Chapter of the Indian Institute of Metals:

- i) Modern Trends in Metal Forming...9-12th July 1980  
Co-ordinators: Mr. P. Venugopal and Dr. S. M. Doraivelu
- ii) Moulding materials and processes...28-31st October 1980  
Co-ordinators: Dr. H. Md. Roshan

### Important Lectures and Seminars

	Lecturers	Topic
i)	Prof. K. R. Abraham Indian Institute of Science Bangalore	Thermochemistry of Electro-slag refining Dilute solute interaction in binary and feruary alloy systems
ii)	Prof. BB. Rath, Naval Research, Washington	Research in Physical Metallurgy at the Naval Research Laboratory
iii)	Prof. P. K. Rohatgi Regional Research Laboratory Trivandrum	Technology Forecasting Composites
iv)	Dr. L. Chandrasekaran Delta Metals Research Laboratory, U. K.	Shape memory effect and its application
v)	Dr. A. K. Ghosh Rockwell International, U.S.A.	Superplastic Forming
vi)	Dr. C. Suryanarayana Benaras Hindu University Varanasi	Structure on melt quenched Al-Pd alloys
vii)	Prof. T. R. Anantharam Benaras Hindu University Varanasi	Metallic Glasses and Rapid Solidification of metals
viii)	Dr. H. E. D. Zuern Messer Griesham West Germany	Corrosion Behaviour of welded structurers in Chemical industry

- |       |  |  |
|-------|--|--|
| ix)   | Prof. K. H. Jack<br>The University of<br>Newcastle Upon Tyne<br>United Kingdom | Mixed-solute clustering in Metals:<br>A new steel strengthening<br>mechanism |
| x)    | Dr. S. A. David<br>Oak Ridge<br>National Laboratory USA.                       | Solidification behaviour of<br>austenitic stainless steel<br>filler metal    |
| xi)   | Dr. John Beech<br>University of Sheffield U.K.                                 | Research into some industrial<br>problems in the field of solidification     |
| xii)  | Dr. George, R. Kingsbury<br>International Operations<br>Gould Inc, U.S.A.      | Laminated Metals-Applications<br>and Processes                               |
| xiii) | Dr. G. S. Kainth<br>Indian Institute of<br>Technology, Kanpur                  | Explosive Welding-an emerging<br>Technology                                  |

## **Research and Development**

### **Research Publications**

Papers - Total numbers published in journals ... 28

Book/monograph : Monograph on Superplasticity - K. A. Padmanabhan, Department of Metallurgy, Indian Institute of Technology, Madras and D. J. Davies (University of Sheffield, U.K.)- Springer Verlag, Berlin 1986.

Departmental Projects ... 5

### **Assistance to Industry-ICC**

Department offered, as in the previous years, consultancy on several industrial problems, particular mention may be made of the consultancy offered to the Steel Authority of India, Ranchi on the formability and weldability of alloy steels.

### **Sponsored Projects**

New project sanctioned: Superplastic Forming of some aluminium and titanium alloys - ARDB, 4.6 lakhs.

### **Any Other Information**

Dr. V. Gopinathan resigned and joined as Deputy General Manager, Central Metal Forming Institute, H.M.T. Hyderabad.

Dr. S. M. Doravelu, Assistant Professor left for U.S.A. on an NRC fellowship for a year from September 1980.

Dr. D. Prabhakar, Assistant Professor left for U.S.A. on an NRC fellowship for 1½ years from November 1980.

Dr. E. G. Ramachandran, Senior Professor left for U.S.A. on an assignment of as Visiting Professor in San Jose University, California, U.S.A. for 2 years from January 1981.

#### **Additional Space Laboratory provided**

A seminar room fully equipped with audio-visual aids with a seating capacity of 100 (Air conditioned - MSB 104)

#### **Visitors to the Department**

Prof. K. P. Abraham, Department of Metallurgy, Indian Institute of Science, Bangalore on 14 and 15-4-1980.

Prof. T. R. Anantharaman, Professor and Jawaharlal Nehru fellow, Banaras Hindu University, Department of Metallurgy, Varanasi 3-11-80 to 5-11-80.

Prof. R. L Appa, Professor of Welding Technology, Department of Materials Technology, Cranfield Institute of Technology - 25-11-1980.

Dr. HED Zuern, Masser Griesheim GmbH, West Germany 26 to 28-11-1980.

#### **Invited Lectures delivered by the staff**

Lecture Topic	Name of the staff
i) Metallurgical aspects in cold rolling of steel flats - Metallurgical Society, Madras	Prof. E. G. Ramachandran
ii) Assessing the drawability of sheet materials Metallurgical Society of India	Prof. K. A. Padmanabhan
iii) Stress corrosion cracking of Weldments R.R.C. Kalpakkam	Dr. S. Prasannakumar
iv) Application of fracture mechanics Institute of Armament Technology, Pune	Dr. S. Prasannakumar

In addition to the above, special lectures on various topics were delivered by the staff members at Guindy Engineering College, HAL Process Planners Course and HAL-BEML Management courses.

#### **Any other information**

- i) Dr. V. Gopinathan, Assistant Professor received a special cash prize of DM 2000/- for his research work on "A comparative study of hot rolling with flat compression test" in West Germany.
- ii) Prof. E. G. Ramachandran has been elected as President of the Indian Institute of Metals, which is a premier professional society in the metallurgical field.

- iii) Prof. H. Md. Roshan has been selected as one of the outstanding metallurgists of the year and received the prestigious National Metallurgists day award from the Ministry of Steels, Government of India.
- iv) Dr. D. R. G. Achar, Assistant Professor was deputed to attend the summer course on "Failure Analysis" at I. I. T. Bombay during May-June 1980.
- v) Prof. R. Vasudevan visited the U. S. S. R. from November 17th to December 18th 1980 as a member of a 3-man Indian Delegation of Scientists to work out the details of collaboration between India and the U. S. S. R. in the area of corrosion and its prevention.
- vi) Dr. R. N. Shenoy, Assistant Professor has been deputed to U. K. for a special training programme in Scanning Electron Microscope for three weeks in March-April 1981.

**Brief Indication and Developmental Programme likely to come up in the near future**

- i) Development of casting processes and foundry equipments.
- ii) Electron and Laser beam welding/cutting facilities.
- iii) Underwater Welding and cutting technology.
- iv) Superplastic forming facilities.

**PHYSICS**

**New Courses introduced**

PH 590 Quantum Mechanic for Engineers  
 PH 733 Optical data processing  
 PH 811 Fourier Optics and Holography  
 PH 750 Experiments in Solid State Physics  
 PH 735 Introductory Solid State

**Changes made in curriculum**

Credit system for M. Sc. has been revised.

**Quality Improvement Programme/UGC Teachers Fellowship Programme**

Serving Teachers Programme :

	M. Tech.	M. S.	Ph. D.
No. of trainees so far for	...	...	74
No. on rolls in each of these courses	...	...	1 under QIP 7 under FIP



## Important Lectures and Seminars

Title	Speaker
i) Radiation effects in A15 superconductors	Prof. B. S. Chandrasekhar T. I. F. R. Bombay
ii) Nuclear demagnetisation experiment and evidence for nuclear antiferromagnetism in Copper	Prof. O. V. Lounasma Helsinki University
iii) Physics at Cambridge	Prof. Schonberg Cambridge
iv) Critical Point Phenomena Amorphous materials	Prof. E. S. Rajagopal I.I.Sc. Bangalore
v) Photovoltaic Devices, IR detectors	Prof. S. K. Mathur I.I.T. Delhi
vi) Solar Cells	Prof. S. C. Jain S.S.P. Lab. Delhi

## Research Publications

Papers - Total numbers published in journals ... 50.

Books/monograph - Title - Authors - Publicity year ... Nil.

Departmental Projects (numbers only) ... 16.

## Assistance to Industry - ICC

Testing of Dielectric properties of insulators resin for EYRE, Ambattur Industrial Estate.

## Any other Information :

Dr. R. S. Sirohi and Dr. V. Balakrishnan have joined as Professors.

## New Major Equipment added

Thin Film Coating Unit.

## QUALITY IMPROVEMENT PROGRAMME

### Serving Teachers Programme :

	M. Tech.	Ph. D.
Number of Trainees so far for	141	148
Number on Rolls in each of these Courses	8	51
Short Term Courses Conducted.....		83

## INDO-GERMAN COLLABORATION

As part of the collaborative Research activity between the I. I. T., Madras and the Federal Republic of Germany, we have a scheme of Joint Indo-German Research Projects wherein part of the Research work is carried out by the Faculty at I. I. T., Madras and part of the Research work is carried out by the counterpart faculty working in different German Universities and Research Institutes.

Under the IV Indo-German Agreement, 16 Joint Research projects were under operation. During the year 1980 - '81 an evaluation of the working of these 16 Indo-German projects was carried out by a Joint Indo-German Team of Experts. This evaluation has revealed that the scheme of Indo-German Joint Research projects has been a very good success and the Expert Team has further recommended that this scheme should be continued in the next (V) Agreement period 1981-'84 also. About 20 new projects are to be taken up during this fresh Agreement period.

## INDO-FRENCH COLLABORATION

Dr. P. Venkateswarlu and Dr. E. G. Tulapurkara Assistant Professors of Department of Aeronautical Engineering were deputed under Indo-French Collaboration.

## INDO-SOVIET PROGRAMME

Dr. R. Vasudevan, Professor, Department of Metallurgy visited Moscow under Indo-Soviet programme of Co-operation on the project 'Corrosion Protection of Metals' during the period 17th November, 1980 to 2nd December, 1980.

## CENTRAL LIBRARY

Following are the significant activities of the different divisions of the Central Library during the period April 1980 to March 1981.

### **Administration Reprography and Bindery (ARB) Division**

With a view to make the Central Library more comfortable and nice to stay and study, the renovation of the Central Library has been taken up and the work on Reading Halls is almost over. It is proposed to have a Joint Study Discussion Room in the remodelled Reading Hall on the First Floor.

Professor Dr. P. S. Srinivasan has taken over as Chairman of the newly constituted Library Advisory Committee.

The following staff members have undergone/gone for further studies :

- 1) Sri R. K. Sankaran ... T. A. —M. A. (Political Science at Sri Venkateswara University at Tirupathi)
- 2) Sri C. C. Tom ... T. A. —at D. R. T. C. Bangalore

The following staff members have attended Seminars/Workshop mentioned against their names :

- |      |   |   |
|------|---|---|
| i)   | Sri V. S. Nazir Ahmed ... Librarian   | Seminar on " Mini Computer " held at Computer Maintenance Corporation Ltd., Madras, 18 - 20th August, 1980.                     |
| ii)  | Sri C. Deenadayalu ... Dy. Librarian<br>Sri P. Venkatesan ... Asst. Librarian | { Seminar of the Administrative Staff held at I. I. T. Madras   |
| iii) | Sri C. Deenadayalu ... Dy. Librarian<br>Sri T. Krishnaswamy ... Tech. Asst.   | { User Education Workshop held at Madras University Library on 27-1-1981  |
| iv)  | Sri V. S. Nazir Ahmed ... Librarian<br>Sri P. N. Swamy ... Tech. Asst.        | ' Layout of University Publications Workshop held at I. I. T. Madras from 2-3-'81 to 6-3-'81                                    |
| v)   | Sri V. S. Nazir Ahmed ... Librarian<br>Sri C. Deenadayalu ... Dy. Librarian   | ' Application of Modern Technology for Bibliographic Control ' Seminar held at Madras University Centenary Buildings on 18-3-81 |

The Reprographic services continued to be made available to all the members of the Institute as well as the external members of Library. To meet the growing demand for Xerox copies of literature in the Library, one more automatic copier machine has been ordered for the Library. The Abstracts of the Ph.D. thesis submitted to the Institute from its inception to date has been compiled and published by the Library in two volumes.

The entire printing of the volumes has been done at the Reprographic Section. Also the publications of Campus News, Campus Times and Focus are being printed regularly by the Reprographic Section.

All the back log of binding work has since been cleared by the judicious distribution of work between the Library binders and external binders.

### **Circulation, Reference and Maintenance (CRM) Division**

The borrowing facility from the Book Bank has been considerably enhanced by streamlining of the procedure and strengthening of the book collection.



## Circulation

1) No. of Readers visited	...	81,029
2) No. of volumes issued	...	88,267
3) No. of Reservation for Books	a) Registered ...	6,763
	b) Fulfilled ...	4,207
4) Amount of Overdue charges and other charges realised	...	74,124.70
5) Inter-Library Loans :		
	Borrowed for Institute Members ...	55
	Lent out from Institute Library ...	35

## Acquisition :

1) Books and Bound Volumes of Periodicals	...	10,046
2) Pamphlets and Reports	...	768
3) Microfilm and Microfiche	...	15
4) Ph. D. Thesis	...	65
5) Total Intake during the year	...	10,894
6) Total accession upto 31-3-1981	...	1,87,852

## Current Periodicals :

1) By Subscription	...	1,227
2) By Exchange/Gift	...	160

## Library Documentation Notes :

1) Internal Recipients	...	161
2) External Subscription	...	29
3) Translations Arranged	...	17

## Reprographic Services

1) Microfilms made	...	928 Frames
2) Photocopies made	...	1,157 Pages
3) Korestat Copies made	...	6,149 Pages
4) Gevafax Copies made	...	1,01,588 Pages
5) Gestafax	...	71 Stencils

## Binding

1) No. of Books and Journals Bound from the Library.	...	670
2) No. of Publications (Reports, Lecture Notes etc.) to Departments bound.	...	413
3) No. of Back Volumes of Journals and Books bound through External Binders.	...	5,407

## CENTRAL WORKSHOP

### Jobs Completed

i) Fabrication of grill testing equipment	Ocean Engineering
ii) Cylindrical Cross Capacitor and U tube manometer	Electrical Engg.
iii) In-Process Diameter measuring Instrument	Mechanical Engg.
iv) Electro Discharge Machine	Mechanical Engg.
v) Machining of Rocket Test Bed	Aeronautical Engg.
vi) Cold head support with table	R. S. I. C.
vii) Fabrication of Cold head Vacuum Jacket	R. S. I. C.
viii) Grinding of thoriated tungston electrodes	Department of Atomic Energy (Kalpakkam)
ix) Bevel gear cutting	CVRDE Avadi Marshall Sons and Co. (Manufacturing) Ltd. Madras & TAFE Ltd. Madras
x) Machining of various components for D.S.T. Project	Machine Dynamic Lab. Applied Mechanics Department
Work orders completed during the period 1980-81	1123

## CENTRE FOR RURAL DEVELOPMENT

The primary objective is employment generation among the four villages that surround the area. The kind of employment will be such that it will generate substantial resources to pay higher emoluments to the workers. In order to ensure external financial discipline the resources required are raised from Bank loans. The total loan taken is around Rs. 40 lakhs (Forty lakhs) and I. I. T. provides a budget of about Rs. five lakhs per year. The resources provided by I.I.T. are to be used for research activities which will generate technological products to ensure high productivity. The projects undertaken from bank loan funds and the Research Activities being pursued from the resources provided by I.I.T. are indicated below :-

### CRD Research Objectives

- i) Scrubbing of biogas to achieve higher temperature.
- ii) Study growth conditions of water hyacinth,
- iii) Evolve decentralised energy systems.
- iv) Use locally available clayey soil to make quality bricks.
- v) Ecologically balanced waste treatment.
- vi) Study feasibility of starting small scale Industries, based on biogas utilisation.
- vii) Utilisation of low cost construction materials.
- viii) Socio economic benefits of Technology Transfer.

### CRD Projects

- i) Paper recycling
- ii) Brick manufacture
- iii) Rice Milling Plant
- iv) Dairy Farm
- v) Fish Culture
- vi) Bakery
- vii) Printing Press

### Educational Programme

In conjunction with the Rural Development Programme which has the primary objective of employment generation, the overall plan also envisages skill oriented educational programmes for village people. These classes are being conducted by I.I.T. students in their spare time. The B. Tech. students of I. I. T.



are also involved in the overall work and they have been assisting by undertaking projects like Solar distillation, Solar pond, Brick making from saline soil, scrubbing of biogas.

### **Training in Crafts**

A scheme has been drawn up for training village level workers in different utility crafts and provide them practical floor experience in operation of different kinds of machinery. Emphasis will be laid on small scale, replicable, low investment Industries which can be fully functional on alternative, decentralised energy systems. In the initial stages, it is proposed to offer training in the following areas to about 60 (sixty) trainees with each being paid a stipend of Rs. 150, - per month for maximum period of two years.

- 1) Biogas applications for Rural Areas
- 2) Carpentry
- 3) Smithy and allied operations
- 4) Screen Printing & Poster Printing
- 5) Welding and Brazing
- 6) Electrical & Electronic applications

The trainees will be picked up from Rural Areas and will hopefully be able to start small scale Industries on their own after the training period.

## INSTITUTE HOSPITAL

The Institute Hospital is a 30 bedded Hospital serving a Campus population of more than 10,000 (Students and Staff Members) and a daily out-patient of an average of 300 patients. It offers out-patient and in-patient service for Medical, Surgical, Obstetrics, Gynaecological, Paediatric and ENT cases. Psychiatric counselling and treatment is also offered.

Dr. P. Venugopalan M. S. is the Surgeon Specialist and Medical Officer in-charge of Institute Hospital.

Dr. P. M. Palani, M. D. is the Part-Time Consulting Physician.

Dr. T. Ramadass B.Sc., M.S., F.I.C.S., D.L.O. is the Part-time ENT Surgeon/Consultant.

Dr. S. Rajkumar, M.D. (Psych.) has joined the Institute as Honorary Consultant Psychiatrist to attend to the mental health of students and staff members. It is proposed to open a 'Student Health Centre' at NCC Block for effective psychiatric counselling.

The following Medical Officers are rendering their services in their respective lines.

- |   |   |
|---|---|
| 1. Dr. N. A. Jayavelan, M.B., B.S.                      | Medical Officer ; assisting the Physician |
| 2. Dr. Sumati Khangaonkar, M.B.B.S., D.A., Anaesthetist | Assisting the Surgeon                     |
| 3. Dr. Lalithakumari, M.B.B.S., D.G.O.                  | Lady Medical Officer                      |
| 4. Dr. Radha Rajagopalan, M.B.B.S., A.B., PED (USA)     | Paediatrician                             |
| 5. Dr. R. Anbazhagan, M.B.B.S.                          | Medical Officer ; assisting the Surgeons  |

One Medical Officer is posted for 'Call Duty' and is available at any time to attend to emergency cases.

Sri L. Palaniappan, M.A., D.H.E. has been appointed as Lay Secretary with effect from 14-4-1980 F. N. to attend to the administrative work of Institute Hospital. He is also entrusted with the work of processing and passing of medical reimbursement claims of the Staff Members.

Additional facilities have been provided in the Laboratory with the appointment of one more Laboratory Technician. It is also proposed to include more

bio-chemical tests and investigations as blood-urea, blood-sugar and Liver function tests.

An Ambulance is available round the clock for any emergency service

In the year 1980 - from January to December, 88 children have been vaccinated against measles and 843 doses (comprising of 4 doses to each child getting primary doses) have been given against Polio.

### Statistics

i) Total number of Out-Patients	...	1,11,653
ii) Total number of In-Patients	...	1,002
iii) Emergencies attended	...	3,812
iv) Dressing	...	16,664
v) Injections	...	48,115
vi) <b>Operations</b>		
a) Major	...	27
b) Minor	...	86
c) E. N. T.	...	64
d) Gynaecological	...	18

### PLACEMENT OFFICE

During the academic session 1979 - 1980, 203 companies/organisations (both public sector and private sector) made contacts with the Placement Office and 110 of them conducted campus interviews.

The following statement gives the departmentwise distribution of placements received through Placement Office during the academic session 1979-1980.

Chemical Engineering	... B. Tech.	... 6
	M. Tech.	... 7
Civil Engineering	... B. Tech.	... 8
	M. Tech.	... 5
Computer Science	... M. Tech.	... 32
	M. S.	... 2
Electrical Engineering	... B. Tech.	... 32
	M. Tech.	... 33

Humanities and Social Sciences	... Industrial Engg. } Industrial }	19
	Management)	13
Mechanical Engineering	B. Tech.	73
	M. Tech.	23
Metallurgy	B. Tech.	10
	M. Tech.	4

The Training and Placement activities commenced this academic year a little earlier than in the previous years. This is mainly because a new scheme combining practical training in a company and eventual placement in the same company was introduced. Out of about 150 firms who were approached regarding their willingness to participate in this new scheme, about 20 firms showed keen interest. But towards the end, only two or three firms have selected around 8 to 10 students under the new scheme, which provides for the selected student an additional project allowance of upto Rs. 400/- p. m. during the course of his final project semester.

In addition to the Placement activities, summer training of about 6 weeks, duration is also being arranged for which, several reputed concerns are being addressed for about 200 interested pre-final B. Tech. and M. Tech. students.

## ALUMNI ASSOCIATION

The Alumni Association from this year has been delinked from the Placement Office and is integrated with the Dean of Students Office. Dean of Students is its Ex-Officio president.

This Association formed in July 1964, now has a membership of about 5000. The membership is open to all students receiving degrees or diplomas conferred by the Institute, as well as to the academic staff of the Institute. It is obligatory for every student to become the life member of the Association by payment of Rs. 50/- during his admission to the Institute

The Aims and objectives of the Association are :

1. To provide an organisation through which its members can keep in touch with the Institute and its students and staff as well as with one another.
2. To enable its members to take part in such activities of the Institute as may contribute to the general improvement of the students of the Institute

3. To help its members to get advice from the Institute on various technical problems which they may come across in their work
4. To bring out from time to time publications which highlight the professional activities of its members
5. To further such other aims as the General Body may decide from time to time

### **Foreign Students**

There are 75 foreign students at present. The qualifications for direct entrance has been progressively raised in the past 2 years and hence the intake is limited. There are mostly nationals of Sri Lanka or Malaysia. There have been no major problems posed by the students. The Foreign students association has been reactivated with fresh elections of office bearers. The Foreign Students Association has been interacting with the rest of the students community effectively. The Advisor participated in a useful seminar organised by the Indian Council for Cultural Relations, Southern region which was attended by several other Advisors of various colleges and Universities.

It is proposed to assign groups of 5-6 students to one faculty member each for a better and closer interaction and to overcome academic, social and psychological difficulties of these students.

## **WEAKER SECTION STUDENTS AND FOREIGN STUDENTS**

### **Weaker Section Students**

Presently there are 156 students including 26 who were admitted this year.

The book bank has been expanded with purchases of more than two hundred books on subjects taught in the fourth and final year B. Tech. courses. The issue of books has been systematised and library timings adjusted in the evening hours to suit the convenience of the students. Books unused by the weaker section students are temporarily transferred to the General Book Bank for use by other students. Correspondence with the Government of India is in progress to provide financial help to IV & V year students for undergoing industrial training and writing of dissertation.

The first year students have been loaned for their entire period of study one instrument box and one minidrafter.

Several public sector companies have been approached with success for additional scholarships and for placement of our final year students. The Institute continues to provide part-time employment to the needy students on hourly basis.

A one day Open House programme was run on 23-12-1980 when about 150 high school students were introduced to the IIT. This is expected to increase the number of good SC/ST students joining the IITs. It is planned to run a short summer laboratory course in Summer for the 1 students of high schools with the help of the science Education Centre located in the Physics Department.

## INSTITUTE GYMKHANA

### Sports Activities

The Institute teams participated in the Madras Collegiate Athletic Association Inter Collegiate League competitions in various games which include Cricket, Football, Hockey, Volleyball, Tennis, Ball Badminton and Basketball. Many of the teams came out successful in the zonal matches.

The Basketball, Volleyball, Chess, Table Tennis, Ball Badminton and Tennis teams also participated in open tournaments such as Bertram Memorial tournament conducted by Loyola College and Stanley Medical Sports festival.

A major achievement was our Hockey team winning the Championship trophy in the Diamond Jubilee Sports festival conducted by the Y. M. C. A. College of Physical Education, Madras.

The Crowning Glory of this year's Sports activities was our winning the General Championship in the Inter IIT Sports meet held at Kanpur in December 1980 for the TENTH YEAR in succession and thus establishing our supremacy in Sports and Games. Details of our Victory are as follows:

<b>GOLD</b>	Athletics Hockey Lawn Tennis Weight Lifting
<b>SILVER</b>	Basket Ball Table Tennis (Men) Volley Ball
<b>BRONZE</b>	Badminton (Shuttle) Football Table Tennis (Women)

A record run was made by Sri C. George I.I.T. Madras in 1500 metres by clocking 4 minutes 11.8 seconds. The previous record for the same was 4 minutes 20 seconds.

This year is noteworthy in that the Institute Gymkhana escalated our annual Basketball tournament for Gerhard Fischer and Kokila Rajaiah trophies for men and women respectively to an All India level open to all the Colleges.

Most of these matches were played under flood light in our Open Air Theatre. Many outstation men's colleges from outside Madras had participated, while only one outstation women's team reported for the tournament. On the whole the fare was excellent and during the six days of the tournament except for one day when due to heavy rains we had to conduct that day's play in the Madras University indoor Basketball courts. A large crowd of more than 4000 witnessed and enjoyed this magnificent spectacle. Many leading firms in Madras had benevolently given financial support to host this tournament. The Gerhard Fischer Cup was won by Loyola College, Madras and the Kokila Rajaiah trophy by Q.M.C. Madras.

This year we also conducted the **Seetha Memorial Football** tournament at the Inter Collegiate level. The Pachayappa's College was declared winners and the Loyola College as runners up.

For the first time we conducted the **Sri Ram Memorial Flood light Volleyball** tournament for City colleges. D. B. Jain college won the tournament and Loyola College were the runners up.

In spite of inadequate practice, our Rowing team was placed 4th in the Inter University Rowing meet held at Madras in December 1980.

Another creditable performance was that our Cricket team came out successful in the Inter IIT Cricket tournament held at the I.I.T. Bombay during the last week of February 1981.

Our Young Chess Champion Mr. Ramesh was a winner in two chess tournaments held at Cuddalore and Mettupalayam (Nilgiris). Mr. Ramesh has been awarded the Sports Talent scholarship of Rs. 1200/- under the NSO Scheme for the year 1980-81 by the NIS Patiala.

Sri K. U. N. Rao, the Physical Training Instructor of our Institute Gymkhana representing Tamilnadu in the 2nd All India Veteran's Athletic meet at Chandigarh secured the third place in the 400 Metres event with a timing of 1 minute 14.9 seconds.

The Inter Collegiate Lawn Tennis tournament was held from 24-3-81 to 31-3-81.

### **Cultural Activities**

It is heartening to note that in spite of stiff competition from reputed colleges, our Cultural contingents swept the General Championship at all the Major Cultural Festival in the country.

The cultural Team of I. I. T. Madras participated in various Cultural Festivals held at Indian Institute of Science, Bangalore, I.I.T. Bombay, I.I.T. Delhi and JIPMER, Pondicherry.

- i) Won the General Championship at I. I. Sc. Bangalore.
- ii) 'Mood Indigo' - Cultural Festival held at I. I. T. Bombay. About 52 colleges have participated in the festival and IIT Madras won the General Championship.

- iii) Cultural Festival - I.I.T. Delhi - In this I.I.T. Madras won the following
  - a) Overall trophy for the best participating team
  - b) Best Music team and
  - c) Best in Literary Activities
- iv) General Championship at JIPMER

In Madras City they also won several prizes in the Literary activities Debate/Quiz.

- a) A.C.College of Technology - Won the Rotract Shield for Quiz
- b) Loyola College - Won the prize for the Best Debating team  
(In the All India Debate)

The Dramatic Group of I. I. T. Madras staged a drama 'Waiting for Lefty' at Museum Theatre produced and directed by the students themselves.

MARDI GRAS '81 was organised between 22nd to 26th January 1981 and 15 outstation teams participated in the Mardi Gras.

## NATIONAL CADET CORPS

### 4(TN) AIR SQN (TECH) NCC

#### Enrolment

NCC Training is spread over three academic year i.e. six semesters. New enrolment is confined to the first year B.Tech. Students. During the academic year of 1980-81, 73 cadets were enrolled. The total strength of the cadets in the Air Wing was 182.

#### Training

Keeping the aims of the NCC in-view, training was imparted to the I, II and III year cadets in accordance with the prescribed syllabus. Basic and advance Military training was also given to the cadets in all the three years of training. The specialised technical training to the cadets covered the two technical branches of the Air Force viz. Mechanical and Electronics. The training was imparted to cadets by qualified Air Force instructors as well as NCC part time officers who are well qualified in their subjects.

Cadets of this unit were given Gliding training also. Only a few of them could spare more time for this and two or three cadets had more than 50 Glider launches to their credit. One of the cadets came out successfully with SOLO Glider flying. Efforts will be made to give Gliding to more cadets this year.



## **Camps and Special Courses**

Annual Training Camp of this unit was held during the month of May 1980-81 along with the sister units under Group 'B' cadets from the unit, took part in the Camp and showed keenness in the camp training and camp discipline. They participated in the Social Service tasks along with cadets from other units and did a good job earning appreciation from higher authorities.

Nine cadets from this unit attended the All India Vayu Sainik Camp held at Bangalore from 15-6-80 to 28-6-80.

## **Ceremonial Parades**

The cadets of this unit attended Republic Day parade held at Marina on 26th January 1981.

## **Social Service Activities: NCC Cadets**

Social service was conducted in Pallikaranai on 7th March 1981.

## **Certificate Examination**

NCC Certificates 'B' and 'C' examinations were conducted in the unit in the month of March 1981. 43 cadets appeared for 'B' certificate and 6 cadets appeared for 'C' certificate.

## **Refresher Course**

Ft. Lt. V. Subrahmanyam and Ft. Lt. K. V. Chalapathi Rao, Part-time NCC Officers of this unit attended the SD Refresher Course (Air Wing) at AF Station, Coimbatore during 1980. Both the officers fared well in Coimbatore.

## **Blood Donation**

Cadets from this unit are in no way lagging behind from other NCC cadets in state in spite of their heavy academic schedule. 31 cadets of this unit including Ft. Lt. K. V. Chalapathi Rao donated their blood at Indian Red Cross Society, Egmore, for which the Hon'ble Governor of Tamil Nadu has issued letter of commendation.

## **Promise Day Parade**

The Promise Day parade is held every year during the month of August during the INDEPENDENCE week to administer the NCC Promise to all the cadets. Prof. P. V. Indiresan, Director took the salute during the Promise Day parade held on 15th August 1980 and administered the promise to all the cadets. He also handed over the 'B' and 'C' certificates and various other camps and courses certificates to the successful cadets during the training year 1979-80.

## HOSTELS

- i) A new hostel has been constructed and it is named Brahmaputra. Post Graduate students are accommodated in that hostel with effect from the academic year 1980-81.
- ii) A cafeteria system of service in the hostels has been proposed and it is intended to start the system in the Vacation messes during the summer vacation.
- iii) It is proposed to equip the hostel kitchens with modern kitchen equipment on an experimental basis. Modern rice cooking vessels and Iddy plant operated by steam has been installed in Sarayu Hostel.

## CONSTRUCTION OF BUILDINGS

The following are some of the important buildings which are in progress or were completed during the course of the year.

### List of works completed

1. Construction of Married Officers Hostel one block (i.e.) Fifth Block.
2. Construction of 'Z' Type Quarters, two blocks.
3. Construction of Students Hostel No. 11.
4. Extension of Sarayu Hostel.
5. Extension to Taramani House.

### Works in progress

1. Construction of one more Floor (i.e) Third Floor over Sarayu Hostel Extension.
2. Construction of R.S.I.C. Building with Second Floor over the existing I Floor.
3. Construction of a building for Sea-Keeping tank and Randum Flume under Ocean Engineering Centre.
4. Construction of T. V. Room and Recreation Room.

## NAMES OF FACULTY MEMBERS, DEPARTMENT-WISE

### AERONAUTICAL ENGINEERING

#### Professors

Dr. K. A. V. Pandalai	Dr. K. A. Damodaran
„ A. K. Srikanth	Prof. K. Balaraman
„ T. K. Bose	Shri C. S. Ballal
„ N. R. Rajappa	

#### Associate Professor

Dr. G. Subramaniam

#### Assistant Professors

Dr. R. M. Siddaveera Gowda	Dr. S. Krishnan
„ T. K. Varadan	„ P. Venkateswarlu
„ S. S. Gokhale	„ E. G. Tulapurkara

#### Lecturers

Dr. A. Krishnan	Sri S. Santha Kumar
	„ S. C. Rajan

### APPLIED MECHANICS

#### Professors

Dr. N. V. Chandrasekharaswamy	Dr. V. Ramamurthi
„ B. V. Aswathanarayana Rao	„ P. S. Srinivasan
„ R. S. Alwar	„ R. S. Srinivasan
	„ T. M. Srinivasan

#### Assistant Professors

Dr. K. Motiram Patil	Dr. Megha Singh
„ S. Venkatesan	„ V. Ramjee
„ M. Balakrishnan	„ B. H. Lakshmana Gowda
„ P. A. Aswathanarayana	„ B. Srinivasa Prabhu
„ S. Narayanan	„ N. Ganesan

#### Lecturers

Sri P. Krishna Iyer	Sri S. Radhakrishnan
Dr. J. Ramachandran	„ J. Lakshminarasimhan
	„ G. Bapaiah

## Scientific Officer GR I

Sri C. R. Subramanian

## Lecturer Grade II

Sri G. Thomas

## CHEMICAL ENGINEERING

### Professors

Dr. D. Venkateswarlu  
.. T. Gopichand  
.. M. Satyanarayana  
.. Y. B. G. Varma

Dr. P. R. Krishnaswamy  
.. M. Ramanujam  
.. N. Subramanian  
.. C. A. Sastri

### Associate Professor

Dr. M. S. Ananth

### Assistant Professors

Dr. K. Remananda Rao  
.. T. Venkatram  
.. N. M. Raghavendra  
.. G. S. Davies  
.. A. Prabhakara Rao

Dr. Ch. Durgaprasada Rao  
.. R. Subramaniam  
.. A. Baradarajan  
.. N. S. Srinivas  
.. S. Subba Rao  
.. C. Chandraprasad

### Lecturers

Dr. R. Vedaraman  
.. T. K. Ramanujam  
.. K. Krishnaiah

Dr. V. Srirama Chandra Rao  
Sri. D. V. Seetharama Murthy

## CHEMISTRY

### Professors

Dr. J. C. Kuriacose  
.. V. Srinivasan  
.. G. Aravamudan  
.. C. N. Pillai

Dr. P. T. Manoharan  
.. C. Kalidas  
.. S. R. Ramadas  
.. V. Ramakrishnan

## Assistant Professors

Dr. J. Rajaram  
,, C. S. Swamy  
,, V. Mahadeva Iyer  
,, K. Narayanan  
,, T. V. Ramakrishna  
,, M. Ramakrishna Udupa

Dr. R. Narayan  
,, M. S. Gopinathan  
,, M. Srinivasan  
,, K. K. Balasubramanian  
,, B. Viswanathan  
,, V. R. Satyanarayana Rao  
,, D. V. Ramana

## Lecturers

Dr. R. Ramaswamy  
,, C. S. Venkatachalam  
,, C. R. Krishnamurthy

Dr. S. Vancheesan  
,, T. K. Varadarajan  
,, N. Balasubramanian

## Lecturers Grade II

Sri. N. Sundaram  
,, T. Subramanian

Sri. M. S. Subramanian

## Senior Scientific Officer Grade II

Dr. R. Viswanath

## CIVIL ENGINEERING

### Professors

Dr. K. S. Sankaran  
,, P. Srinivasa Rao  
,, D. Johnson Victor  
,, H. Raman  
,, M. S. Subramanian

Dr. L. N. Ramamurthy  
,, C. S. Krishnamurthi  
,, R. Radhakrishnan  
,, T. P. Ganesan  
,, N. Rajagopalan

### Associate Professors

Dr. Nainan P. Kurian

Dr. K. Elango

### Assistant Professors

Sri R. L. Roy Choudhury  
Dr. V. Paramasivam  
,, H. Achyutha  
,, P. Kalyanasundaram  
,, V. Kalyanaraman  
,, S. Narasimha Rao

Dr. P. Sambandam  
,, H. Suresh Rao  
,, Y. R. Nagaraja  
,, P. K. Aravindan  
,, N. R. Krishnaswamy  
,, V. R. Rangaraju

## Lecturers

Sri V. D. Muthayya	Dr. S. Dakshinamurthy
Dr. K. N. Ramamurthy	.. B. S. Thandeveswara
Sri D. Hariharan	.. A. Ramakrishna Rao
Sri M. S. Mathew	.. K. Gopalakrishnan

## Lecturers Grade II

Sri S. Meenakshisundaram	Sri A. Ramachandraiah
	Sri V. G. Idichandy

## Visiting Professor

Shri R. Thillainayagam

## ELECTRICAL ENGINEERING

### Professors

Dr. P. Venkata Rao	Dr. B. Ramaswami
.. M. Venugopal	.. V. Seshadri
.. V. G. K. Murti	.. A. Kuppurajulu
.. M. K. Achuthan	.. Y. Narayana Rao
.. K. P. Rajappan	.. J. P. Raina
.. D. K. Banerjee	.. V. V. Sastry
.. K. Radhakrishna Rao	

### Associate Professors

Dr. V. V. Bapeswara Rao	Dr. P. Sankaran
-------------------------	-----------------

### Assistant Professors

Dr. C. Dattatreyan	Dr. P. Subbarami Reddy
.. M. Mukunda Rao	.. C. Narayana Reddy
.. G. Sridhara Rao	.. T. A. Ramalinga Bhat
.. Vedam Subramanian	.. T. J. Vitto
.. A. Chandrasekaran	.. S. Srinivasan
.. C. Eswaran	.. M. Antony Reddy
.. R. Parthasarathy	.. S. S. Yegnanarayanan
.. M. V. Chalapathy Rao	.. V. C. V. Pratapa Reddy
.. R. Parimelazagan	.. V. Venkata Rao
.. B. S. Bhanumurthy	.. S. Elangovan
.. K. N. Bhat	.. P. A. Janakiraman

## Lecturers

Sri Varadarajan Subramaniam	Sri K. Palaniswamy
„ M. Krishnamurthy	„ S. Yuvarajan
„ P. C. Majhee	Dr. C. Venkateshiah
„ G. T. Manohar	„ P. Sashidhara Rao
	Sri G. Govardhanagiri Rao

## Senior Design Engineers

Sri S. Raman	Sri P. Ramaseshagiri Rao
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## Visiting Faculty/Scientist

Sri K. P. Ramaswamy

## HUMANITIES AND SOCIAL SCIENCES

### Professors

Prof. R. K. Gupta	Dr. V. Anantaraman
Dr. S. Ramani	

### Associate Professors

Dr. A. V. Krishna Rao	Dr. L. V. L. N. Sarma
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### Assistant Professors

Sri V. S. N. Sarma	Sri E. Unnikrishnan
Dr. V. Arumugam	Dr. R. Rajagopalan
„ C. Ramachandran	„ (Mrs) V. Hamsaleelavathy
	„ (Mrs) Sakunthala Balaraman

### Lecturers

Sri V. S. Kumar	Sri Krishnakumar Menon
„ S. B. Dias	„ T. T. Narendran
„ V. Jayasankar	Mrs Elizabeth Nainan Kurian
Miss Rita Ghatak	Sri Durgaprasada Rao
	„ Mukhesh Kumar Williams

## MATHEMATICS

### Professors

Dr. S. D. Nigam	Dr. L. V. K. V. Sarma
„ S. K. Srinivasan	„ K. M. Das
„ H. S. Paul	„ K. R. Parthasarathy
„ R. Subramaniam	

## Associate Professor

Dr. V. B. Johri

## Assistant Professors

- |                       |                     |
|-----------------------|---------------------|
| Dr. V. Subba Rao      | Dr. T. S. Sankara   |
| " D. S. Subramanyam   | " U. N. Srivastava  |
| " Y. Nagendra         | " P. Achuthan       |
| " A. Avudainayagam    | " P. Bhattacharya   |
| " Surendranath Majhi  | " C. M. Purushotham |
| " P. R. Parthasarathy | " (Mrs) S. Kalpakam |

## Lecturers

- |                       |                         |
|-----------------------|-------------------------|
| Dr. C. V. Raghava Rao | Dr. S. N. Venkatarangam |
|-----------------------|-------------------------|

## Senior Scientific Officer Grade II

Dr. K. Swaminathan

## MECHANICAL ENGINEERING

### Professors

- |                        |                        |
|------------------------|------------------------|
| Dr. B. S. Murthy       | Dr. H. C. Radhakrishna |
| " M. C. Gupta          | " D. Prithviraj        |
| " V. C. Venkatesh      | " G. V. N. Rayudu      |
| " M. A. Parameswaran   | " V. Radhakrishnan     |
| " V. M. Krishna Sastry | " H. Chandrasekaran    |
| " M. V. Krishnamurthy  | " R. Natarajan         |
| " K. Lakshminarayana   | " K. V. Gopalakrishnan |
| " K. A. Bhaskaran      | " K. N. Seetharamu     |
| " M. A. Veluswamy      |                        |

### Associate Professors

- |                     |                  |
|---------------------|------------------|
| Dr. A. Rammohan Rao | Dr. V. Sriramulu |
|---------------------|------------------|

### Assistant Professors

- |                     |                       |
|---------------------|-----------------------|
| Dr. B. Nagalingam   | Dr. R. Raman          |
| " U. S. P. Shet     | " M. Ravindran        |
| " K. Gopinath       | " S. Srinivasamurthy  |
| " Vijay R. Raghavan | " P. Srinivasa Rao    |
| " P. K. Philip      | " R. Krishnamurthy    |
| " T. Rajagopalan    | " N. Venkatarayulu    |
| " V. Ganesan        | " M. S. Shanmugam     |
| " M. P. Kothiyal    | " M. Madhusudhana Rao |
| " V. Seshagiri Rao  | " A. Venkatesh        |



## Lecturers

Shri K. S. Padiyar	Shri V. Balabaskaran
.. K. R. Govinda Mallan	.. O. Venkata Krishnaiah Chetty
.. V. N. Rajan	.. S. Kumaraswamy
.. D. V. Ramalingeswara Rao	.. J. Fazlur Rahman
.. K. V. Thiagarajan	.. G. Anjaneyalu
.. K. V. Chalapathi Rao	.. V. Venkateswara Rao
.. K. Ramakoteswara Rao	.. G. Muthu Veerappan
.. S. Rajesham	Dr. G. Kuppuswamy
.. K. N. Gopalan	Sri V. Jayaprakash
Dr. K. Narayanaswami	.. Y. G. Srinivasa

## Lecturer Grade II

Sri S. Krishnamurthy

## Design Engineers

Sri T. Nagarajan

Sri M. Singaperumal

Sri A. Arun

## METALLURGY

### Professors

Dr. E. G Ramachandran	Dr. K. Srinivasaraghavan
.. R. Vasudevan	.. H. Md. Roshan
.. V. Panchanathan	.. K. Ananthapadmanabhan

### Assistant Professors

Sri R. K. Srikanta Kumaraswamy	Dr. D. R. Gopalakrishna Achar
Dr. V. M. Radhakrishnan	.. K. J. Lakshminarayana Iyer
.. S. Prasanna Kumar	Mr. R. N. Shenoy
.. O. Prabhakar	Dr. S. M. Duraivelu

### Lecturers

Sri S. Ramakrishna Iyer	Sri S. D. Pathak
Dr. C. V. Gokularathnam	.. V. Jagasivamani
.. S. Raghavan	.. P. Kesavan Nair
Sri P Venugopal	

## Lecturer Grade II

Sri S. Kumaran

## PHYSICS

### Professors

Dr. C. Ramasastry	Dr. Y. V. G. S. Murthy
„ B. V. Ramanamurthy	„ J. Sobhanadri
„ S. Radhakrishna	„ R. S. Sirohi
„ R. Srinivasan	„ V. Balakrishnan

### Associate Professor

Dr. V. Sivaramakrishnan

### Assistant Professors

Dr C. K. Narayanaswami	Dr. B. M. Sivaram
„ S. Swaminathan	„ K. V. S. Rama Rao
„ S. Bhimasankara Sastri	„ G. Rangarajan
„ K. Viswanatha Reddy	„ A. V. Narasimhan
„ R. Ramji Rao	„ B. V. R. Chowdhari
	„ (Mrs) Maha Seshasayee

### Lecturers

Sri V. Ramabhadran	Dr. V. Ramachandran
Dr. B. Subrahmanyam	„ V. Damodara Das
Dr. B. S. V. Gopalam	„ G. Srinivasamurthy
Dr. B. S. V. S. Ramachandracharyalu	„ Jagabhandhu Majhi
Dr. K. Srinivasan	„ Sriraman Srinivasan
	„ S. Srinivasan

### Lecturers Grade II

Sri K. Sarangapani	Kum T. M. Vimala
„ V. Subramanyamurthy	Sri T. S. Natarajan

## REGIONAL SOPHISTICATED INSTRUMENTATION CENTRE

### Professors

Dr. Surjit Singh	Dr. S. Subramanian
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### Scientific Officer Grade I

Dr. T. K. K. Srinivasan

## **OCEAN ENGINEERING CENTRE**

### **Professors**

Dr. V. S. Raju

Dr. C. Ganapathi Chettiar

### **Assistant Professors**

Dr. M. R. Pranesh

„ C. P. Vendhan

„ K. Ganesh Babu

Dr. A. S. J. Swamidas

„ K. Muthukrishniah

### **Lecturer**

Dr. S. P. Subramanian

### **Senior Scientific Officer Grade II**

Shri N. R. Joglakar

## **ENERGY RESEARCH CENTRE**

### **Assistant Professor**

Dr. S. Elangovan

## **FIBRE RE-INFORCED PLASTIC RESEARCH CENTRE**

### **Chief Design Engineer**

Dr. N. Gopalakrishnan Nair

### **Assistant Professor**

Dr. P. Palaninathan

### **Design Engineer**

Sri B. Jagadish Chandra Babu

## **INDUSTRIAL CONSULTANCY CENTRE**

### **Chief Techno Economic Officer**

Dr. D. Balakrishnan

**Techno Economic Officers (Sr.)**

Sri C. Sivaprasada Rao

Sri Y. G. Narasimha

**Techno Economic Officer**

Sri R. Ambalavanan

**ENGINEERING DESIGN CENTRE**

(Machinery Equipment)

**Chief Design Engineer**

Sri T. S. Chennabasavan

**Senior Design Engineers**

Sri Dev Kishore Sharma  
,, S. K. Malhotra

Sri S. D. Kalander Saheb  
,, R. Ramachandran

**Design Engineer**

Shri H. V. Bhasin

**CENTRE FOR SYSTEMS AND DEVICES**

**Professors**

Dr. B. Kakati

Dr. M. S. Narasimhan

**Lecturer**

Sri M. C. Chandra Mouli

**Senior Scientific Officer**

Sri P. R. Vaya

**Senior Scientific Officer Gr. II**

Sri Krishnan Kumar

**Design Engineers**

Sri V. N. Shukla

Smt. Ranjana Shukla

## **COMPUTER CENTRE**

### **Professors**

Dr. H. N. Mahabala  
,, C. R. Muthukrishnan  
,, R. Nagarajan

Dr. K. Thulasiraman  
,, R. Kalyanakrishnan  
,, B. Yegnanarayana

### **Assistant Professors**

Dr. Kumar Subramanian

Dr. K. B. Lakshmanan

### **Lecturer**

Dr. (Mrs.) Kamala Krithivasan

### **Manager (Systems)**

Sri S. Srinivasan

### **Assistant Manager (Operations)**

Sri P. Seshasayee

### **Senior Systems Programmers**

Sri M. Kothanda Ramanujam

Sri V. Aravamudan

### **Systems Engineer (Operations)**

Sri R. Deenadayalu

### **Programmer Grade I**

Sri N. Anantha Padmanabhan Thamby

### **Programmers Grade II**

Smt. Vijayalakshmi Sirohi

Smt. Vatsala Krishnan

Shri G. Kannan

### **Shift Engineer**

Shri K. G. Sundararajan

## **CENTRAL ELECTRONIC CENTRE**

### **Scientific Officer Grade I**

Sri T. N. Ranganathan

### **Scientific Officer Grade II**

Sri R. Rangachari

## **CENTRAL WORKSHOP**

### **Senior Workshop Superintendent**

Sri S. Jambunathan

### **Assistant Workshop Superintendent**

Sri N. L. N. N. Kumar

## **MATERIALS SCIENCE RESEARCH CENTRE**

### **Assistant Professor**

Dr. G. V. Subba Rao

## **DEANS**

Academic Course	...	Dr. N. V. C. Swamy
Academic Research	...	.. R. Srinivasan
Industrial Consultancy and Sponsored Research	...	.. P. Srinivasa Rao
Staff Welfare	...	.. D. Venkateswarlu
Students	...	.. P. T. Manoharan

## **Advisers**

Foreign and Weaker Section Students	...	Dr. P. Achuthan
Sports activities	...	Prof. K. Balaraman
Cultural activities	...	Dr. R. Natarajan
Training and placement	...	.. R. Narayanan

## ADMINISTRATION

### Director's Office

Director

Dr. P. V. Indiresan

### Secretaries

Sri V. V. Natarajan

Sri M. N. Srinivasan

## CENTRAL ADMINISTRATION

### Registrar

Sri R. S. Virmani

### Deputy Registrars

Sri W. Hanumesi Rao  
(Administration)

Sri M. Gopalan  
(Academic)

Sri V. Shanmugam  
(Administration)

### Budget and Audit Officer

Sri R. Venkataraman

### Finance and Accounts Officer

Sri A. V. Karunakaran Nambiar

### Stores and Purchase Officer

Sri A. Thirunavukarasu

### Chief Security Officer

Sri S. Ramanathan

### Security Officer

Sri T. N. Venkataraman

### Assistant Registrars

Sri D. Thiagarajan  
(Recruitment & Projects)

Sri G. R. Raghunatha Rao  
(Academic)

### Assistant Finance and Accounts Officers

Sri R. Kannan

Sri Mohamed Yacoob

### Assistant Stores and Purchase Officer

Sri M. C. James

### Assistant Security Officer

Sri Jesudian Cruz

## ENGINEERING UNIT

Executive Engineer

Sri Y. S. Nagaraja Rao

### **Assistant Engineers**

Sri Abraham Varghese	Sri S. Swaminathan
.. N. Malayalam	.. S. K. Pati
.. D. R. Patel	.. J. C. Jinadoss
.. D. Ramanathan	.. R. Sankaran
.. M. Doorvasulu Reddy	

### **Horticultural Superintendent**

Sri P. Manickavachakam

Total number of staff (Academic)	375
Total number of staff (Non-Academic)	1634
No. of staff members Joined	178
No. of staff members promoted	75
No. of staff members relieved	50
(Retired/Terminated/Death)	



## BUDGET PROPOSALS

(Figures in lakhs of rupees)

(1)	Budget Estimates 1980-81		Revised Estimates 1980-81	Budget Estimates 1981-82
	as per Finance Committee	as allocated by Board of Governors		
(1)	(2)	(3)	(4)	(5)
<b>Non-Plan</b>				
Recurring	460.14	438.85	474.00	509.50
Non. Recurring	6.00	6.00	6.00	6.00
<b>Total (Non. Plan)</b>	<b>466.14</b>	<b>444.85</b>	<b>480.00</b>	<b>515.50</b>
<b>Plan</b>				
<b>Recurring</b>				
Ocean Engg.	* *	7.40	5.10	9.00
Other than Ocean Engg.	24.16	11.63	13.71	29.50
<b>Non Recurring</b>				
Ocean Engg.	* *	27.60	29.90	19.50 £
Other than Ocean Engg.	110.84	130.28	123.75	190.88 @
<b>Total Plan</b>	<b>* *</b>	<b>176.91</b>	<b>172.46</b>	<b>248.88</b>
<b>Income</b>	<b>86.58</b>	<b>86.58</b>	<b>93.34</b>	<b>93.95</b>

\* \* Proposal of the Institute for Rs. 51.37 lakhs were required to be reconsidered and the figures are as in column (3)

£ The Finance Committee noted that the requirements, if taken as projected, the original sanction of Rs. 150.00 lakhs for the Centre will not be sufficient and that addl. provision of about Rs. 20.00 lakhs at least may be needed. It was suggested that a specific request for grant of additional funds may be made to the Ministry.

@ The requirements were noted by the Finance Committee. As the 6th Plan allocation including plan allocation for 1981-82 will be known only later, no definite recommendations could be made by the Finance Committee at that stage.

**Statement of Accounts**  
**1979-80**

INDIAN INSTITUTE OF  
RECEIPTS AND PAYMENTS ACCOUNT

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RECEIPTS

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	Rs.
<b>Opening Balance</b>	
Receipts on Capital Account	2,42,45,379
Grant from Government of India on Capital Account	1,94,73,000
<b>Other Capital Receipts</b>	
Refund of Customs Duty	20,67,315
Sale proceeds of Ambulance Van and Institute Bus	40,789

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C/o. 4,58,26,483

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# TECHNOLOGY, MADRAS

FOR THE YEAR 1979-80

## PAYMENTS

	Rs.	Rs.
<b>On Capital Account</b>		
(i) Works and Buildings		60,37,930
(ii) (a) <b>Equipment Furniture and Fittings Departments</b>		
1. Chemistry	1,42,822	
2. Physics	1,30,050	
3. Mathematics	24,380	
4. Humanities & Social Sciences	61,062	
5. Civil Engineering	2,87,530	
6. Mechanical Engineering	8,32,372	
7. Electrical Engineering	4,46,781	
8. Chemical Engineering	2,08,229	
9. Metallurgy	6,26,100	
10. Applied Mechanics	2,56,302	
11. Aeronautical Engineering	3,06,150	
		33,21,778
(b) <b>Indigenous Capital Equipment</b>		
1. Chemistry	...	
2. Chemical Engineering	...	
3. Mechanical Engineering	...	
4. Applied Mechanics	...	
5. T. V. Lab	19,385	
		19,385
(c) <b>Central Services</b>		4,85,076
(d) <b>Research Centres</b>		
Engineering Design Centre	13,227	
Regional Sophisticated Instrumentation Centre	1,10,079	
Composite Structure (FRP)	1,57,756	
Material Science Research Centre	89,651	
Energy Research Centre	1,09,436	
Inter University Partnership Projects	28,853	
Television Lab	79,016	
Futurology		5,88,018
(e) Central Workshops		75,709
(f) Computer Centre		7,48,194
(g) Centre for Rural Development		1,23,377
(h) Replacement of obsolete Equipment		6,56,023
(i) Indo French Collaboration Programme		7,421
	C/o.	1,20,62,911



TECHNOLOGY, MADRAS

FOR THE YEAR 1979-80

PAYMENTS (Contd.)

	B/F	Rs.	Rs.
			1,20,62,911
(iii) <b>Customs Duty on West German Equipment</b>			
Customs Duty and Clearance Charges			72,54,896
(iv) Furniture and Fittings (Departments, Office and Library etc.)			4,33,512
(v) <b>Others</b>			
Motor Vehicles	1,78,854		
Cycles	6,879		
Typewriters and Duplicators	57,151		
Hospital Equipments	65,000		
Telephones	—		
Fire Fighting Equipments	—		
			<u>3,07,884</u>
(vi) <b>Library</b>			
(i) Books	6,13,713		
(ii) Journals and Back Volumes	7,82,459		
(iii) Equipment	33,853		
			<u>14,30,025</u>
<b>Revenue Account</b>			
<b>Academic Sections—Pay and Allowance of Teaching Staff</b>			
1. Chemistry		8,07,923	
2. Physics		7,59,263	
3. Mathematics		5,10,212	
4. Humanities & Social Sciences		4,84,442	
5. Civil Engineering		8,72,028	
6. Mechanical Engineering		12,74,394	
7. Electrical Engineering		11,48,989	
8. Chemical Engineering		5,63,684	
9. Metallurgy		4,17,943	
10. Applied Mechanics		5,55,128	
11. Aeronautical Engineering		4,30,163	
			<u>78,24,169</u>
	C/o.		<u>2,93,13,397</u>

INDIAN INSTITUTE OF  
RECEIPTS AND PAYMENTS ACCOUNT

RECEIPTS (Contd.)

	Rs.	Rs.
	B/F	7,23,14,108
<b>Other Receipts</b>		
Application fees from students	6,32,671	
Application fees for posts in the Institute	4,962	
Admission fees	36,234	
Grade Card	4,772	
Gymkhana Receipts (Campastimes)	—	
Institute Bus Collection	2,96,094	
Hire Charges on Institute Vehicles	33,677	
Library Overdue Collections	26,435	
Institute Day and Association fees	15,001	
Student's Amenities Fund Receipts from students	25,414	
Alumni Association Fund	16,605	
	<u>          </u>	10,91,865
<b>Interest</b>		
Interest on Conveyance Adv.	2,247	
Interest on Security Deposits with Tamil Nadu		
Electricity Board	16,960	
Interest on call deposits with SBI & Endowments	4,59,545	
	<u>          </u>	4,78,752
<b>Miscellaneous Receipts</b>		
Sale of Question papers, Tender forms Iron Scrap, etc.	12,55,338	
Miscellaneous Recoveries	9,063	
Breakages from students	127	
Hire charges for Gowns	1,223	
Guest House Boarding Charges	9,216	
Subscription to Journal of Mathematical & Physical Science and sale proceeds of Institute Publications }	61,744	
Migration Certificates	193	
Library Membership fees	25,722	
Short Term & Other Courses	2,17,662	
	<u>          </u>	15,80,288
	C/o.	<u>7,54,65,013</u>

TECHNOLOGY, MADRAS

FOR THE YEAR 1979-80

PAYMENTS (Contd.)

	B/F	Rs.	Rs.
			2,93,13,397
<b>(ii) Pay and allowances for Non-Teaching Staff</b>			
1. Chemistry		2,53,945	
2. Physics		4,60,702	
3. Mathematics		34,664	
4. Humanities & Social Sciences		64,654	
5. Civil Engineering		4,55,039	
6. Mechanical Engineering		9,22,648	
7. Electrical Engineering		6,46,375	
8. Chemical Engineering		3,61,416	
9. Metallurgy		3,13,351	
10. Applied Mechanics		2,53,168	
11. Aeronautical Engineering		1,57,146	
			39,23,108
<b>(iii) Departmental Expenses</b>			
1. Chemistry		2,60,234	
2. Physics		2,14,171	
3. Mathematics		25,645	
4. Humanities & Social Sciences		21,902	
5. Civil Engineering		2,89,369	
6. Mechanical Engineering		6,10,878	
7. Electrical Engineering		5,54,173	
8. Chemical Engineering		3,32,899	
9. Metallurgy		5,40,701	
10. Applied Mechanics		3,36,260	
11. Aeronautical Engineering		2,83,317	
			34,69,549
Centre for Rural Development			
Officers (Pay & Allowance)			33,656
Indo-German Projects (Pay & Allowances)			89,316
	C/o.		3,68,29,026



INDIAN INSTITUTE OF  
RECEIPTS AND PAYMENTS ACCOUNTS

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RECEIPTS (Contd.)

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	Rs.	Rs.
B/F		7,54,65,013
<b>Receipts from Buildings</b>		
Licence Fee	8,77,986	
Electricity, Water & Services Charges	<u>2,89,502</u>	
		11,67,488
<b>Lawns and Gardens</b>		
Unfructs & Sewage farm		30,325
Receipts from Computer Centre		37,28,314
Central Photographic Section		18,048
General Stores		—
	C/o.	<u>8,04,09,188</u>

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# TECHNOLOGY, MADRAS

FOR THE YEAR 1979-80

## PAYMENTS (Contd.)

	B/F	Rs.	Rs.
			3,68,29,026
<b>a. Library</b>			
Pay & Allowances (Officers)		1,08,850	
-do- (Establishment)		3,83,748	
Journal of General Interest		12,324	
Contingencies Operating cost		74,461	
Binding Charges		41,430	
			6,20,813
<b>b. Computer Centre</b>			
Pay & Allowances (Officers)		2,82,311	
-do- (Others)		1,50,605	
Other Charges		17,09,555	
Payment to IBM for Non-Qualifying usage		—	
			21,42,471
<b>2. Centres</b>			
Pay & Allowances (Officers)		2,47,847	
-do- (Establishment)		3,34,469	
			5,82,316
<b>c. Central Workshops</b>			
Pay & Allowances (Officers)		51,983	
-do- (Establishment)		10,77,754	
Working Expenses (Departments Tools & Other consumables)		1,98,750	
			13,28,487
Stipend for apprentices			40,502
<b>d. i) Central Electronic Centre</b>			
Pay & Allowances			1,05,342
<b>ii) Air Conditioning Unit</b>			
Pay & Allowances			68,222
<b>e. Special Instruments Lab (RSIC)</b>		71,413	
Electron Microscope Lab		42,974	
Electronic Instruments Servicing & Dev. Centre		46,883	
Central Photographic Section		31,914	
Central Glass Blowing Section		21,501	
Air Conditioning Unit		84,710	
X-ray Defraction Laboratory		40,313	
Energy Research Centre		62,389	
Centre for Rural Development		23,549	
Fibre Reinforced Plastic Research Centre		60,530	
		4,86,176	
	C/o.		4,17,17,179

INDIAN INSTITUTE OF  
RECEIPTS AND PAYMENTS ACCOUNT

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RECEIPTS

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	Rs.
B/F	8,04,09,188

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C/o.	8,04,09,188
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# TECHNOLOGY, MADRAS

FOR THE YEAR 1979-80

## PAYMENTS

	B/F	Rs.	Rs.
Television Engg. Lab		4,86,176	4,17,17,179
Engg. Design Centre		50,543	
Material Science & Research Centre		28,580	
Indo-German Projects		80,303	
Indo French Collaboration		1,77,497	
		3,075	
			8,26,174
<b>f. Institute Scholarships</b>			
Post-Graduate and Research		29,51,081	
Under Graduate		8,26,190	
			37,77,271
<b>g. N.C.C.</b>			
Pay & Allowances		48,350	
Other Expenditure		34,634	
			82,984
<b>h. Athletic and Gymkhana</b>			
Pay & Allowances		24,089	
Other Expenditure		3,20,298	
			3,44,387
<b>i. Other Items</b>			
Part-Time Lectures		8,252	
Visiting Professors		19,839	
Technical Bulletins & Journals		40,930	
Symposia & Seminars		20,622	
Inplant Training/Courses/Visits		49,575	
Continuing Education Programme Organised by the Institute		2,13,041	
Quality improvement programme (Initiated by the Ministry of Education)		10,322	
Director's Laboratory		—	
Director's Discretionary Fund for Research		222	
Membership Fees to outside bodies		39,127	
Remuneration to External Examiners		43,107	
Convocation		59,057	
Prizes for Academic Distinction		1,020	
Joint Entrance Examination		2,11,406	
Common Examination for Post-Graduate Admission (CEPA)		1,60,347	
Contribution towards Institutes participation of Programme of National Conference		5,000	
			8,81,867
	C/o.		4,76,29,862

INDIAN INSTITUTE OF  
RECEIPTS AND PAYMENTS ACCOUNT

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RECEIPTS

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	Rs.
B/F	8,04,09,188

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C/o.	8,04,09,188
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TECHNOLOGY, MADRAS

FOR THE YEAR 1979-80

PAYMENTS

	B/F	Rs.	Rs.
			4,76,29,862
<b>Hostels</b>			
Allowances to Wardens			9,077
<b>iv) Other Sections</b>			
<b>a) Central Administration</b>			
Pay and Allowances of Officers		3,39,415	
Pay and Allowances of other Staff		20,11,944	
			23,51,359
<b>b) Contingencies</b>			
Postage		1,78,686	
Entertainment		16,367	
Telephone		4,38,880	
Liveries		37,186	
Stationery		3,39,938	
Printing		85,358	
Advertisement		1,68,947	
Miscellaneous Expenses		2,45,134	
			15,10,496
<b>c) Other Items</b>			
Director's Discretionary Fund Payments		2,820	
Less Recoveries		610	
			2,210
<b>Stores</b>			
Pay & Allowances of Officers		26,549	
Pay & Allowances of Other Staff		2,25,684	
			2,52,233
<b>General Stores</b>			
Purchases		76,593	
Less Issues		64,183	
			12,410
Security			2,15,459
Special Security Guards			1,41,667
<b>Lawns &amp; Gardens</b>			
Pay & Allowance of Horticultural Superintendent		18,537	
Wages to Labourers, Purchase of seeds etc.		2,86,786	
			3,05,323
<b>Power</b>			21,87,631
	C/o		5,46,17,727

INDIAN INSTITUTE OF  
RECEIPTS AND PAYMENTS ACCOUNT

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RECEIPTS

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	Rs.
B/F	8,04,09,188

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C/o.	8,04,09,188
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TECHNOLOGY, MADRAS

FOR THE YEAR 1979-80

PAYMENTS

	Rs.	Rs.
B/F		5,46,17,727
Mosquito Control		—
Water		8,45,314
Oil & Petrol		1,33,373
Repairs & Maintenance of Furnitures		98,157
Duty, Insurance and Road Taxes		45,185
Repairs & Maintenance Motor Vehicles		2,23,845
Fire Fighting Operating Cost		4,376
<b>Works &amp; Maintenance</b>		
Pay & Allowances of Officers	79,454	
Pay & Allowances of Other Staff	7,06,364	
Other expenditure on Maintenance	24,83,973	
Property Tax	2,40,028	
		35,09,819
<b>Hospital</b>		
Pay & Allowances of Medl. Officers	1,33,542	
Pay & Allowances of Other Staff	1,46,643	
Purchase of Medicines etc.	4,06,318	
		6,86,503
Grant to Central School		—
Grant to Vana Vani High School		—
Repairs & Maintenance of Typewriters & Duplicators		33,235
Audit Charges		22,950
Legal Expenses		1,222
Honorarium to Legal Adviser		—
Honorarium to Part-time Liaison Officer		—
<b>Travelling Allowances</b>		
Board of Governors	9,155	
Staff Committees, Selection Committees etc.	27,926	
Candidates called for interview for appointment etc.	35,544	
External Examiners	67,099	
Joint Entrance Examination	22,407	
Common Examination for Post-Graduate Admission	21,537	
		1,83,668
<b>Commitment under Indo-German Agreement</b>		
Customs Duty on personal effects of West German Experts	61,398	
Lodging Allowance to Experts	—	
Other Facilities	—	
		61,398
C/o		6,04,66,772



INDIAN INSTITUTE OF  
RECEIPTS AND PAYMENTS ACCOUNT

RECEIPTS

B/F	Rs.	Rs.
		8,04,09,188
<b>Recovery of Advances</b>		
Motor Car and other conveyance	1,67,429	
Festival Advance	2,18,103	
Customs Duty on Equipment from West Germany	71,79,769	
Customs Duty on personal effects of West German Experts	61,062	
On account of UNESCO Coupons	—	
Miscellaneous Advance	2,76,811	
Flood Advance	<u>4,58,375</u>	
		83,61,549
<b>Deposits</b>		
Suppliers' Deposits (Institute)	1,11,807	
Contractors' Deposits (Works)	6,60,686	
External Scholarship	6,46,517	
CSIR	5,26,136	
Student's caution Deposits	30,980	
Miscellaneous Deposits	56,80,528	
Quality Improvement Programme (Organised by Government of India) Centre for Systems & Devices (Defence Ministry)	17,87,500	
Industrial Consultancy work & Projects	66,12,372	
Cryogenics Engg. (Sub-Centre)	<u>66,600</u>	
		1,61,23,126
<b>Centres</b>		
Grant from Government of India for Ocean Engg. Centre		
On Capital Account	17,37,000	
On Revenue Account	<u>7,63,000</u>	
		25,00,000
	C/o	<u>10,73,93,863</u>

# TECHNOLOGY, MADRAS

FOR THE YEAR 1979-80

## PAYMENTS

	B/F	Rs.	Rs.
			6,04,66,772
Contribution to Societies		1,000	
L. S. & P. C. on account of personnel on Foreign Services		7,866	
Contribution to Employees Welfare Scheme		18,474	
Training and Welfare activities of Staff Members		—	
Subsidy to Hostels due to revision of salary for Hostel Employee		5,98,169	
Campus Amenities		29,330	
			6,54,839
<b>Provident Fund/Gratuity/Pension</b>			
C. P. F. (Contribution & Interest)		1,65,000	
C. P. F. cum-Gratuity (Contribution & Interest)		20,53,000	
G. P. F. cum pension-cum-Gratuity (Interest)		35,000	
Gratuity & Pension		81,587	
Deposit Linked Insurance		66,846	
			24,01,433
<b>Advance Paid</b>			
Motor Car and other conveyance		2,18,661	
Festival Advance		2,26,740	
Customs Duty on Equipment from West Germany		72,71,915	
Customs Duty on Personal effect on West Germany Experts		50,000	
UNESCO Coupons		—	
Other Miscellaneous Advance		1,90,479	
House Building Advance		5,00,000	
Flood Advance		5,18,217	
			89,76,012
<b>Refund of Deposits</b>			
Supplier's Deposits (Institute)		91,918	
Contractor's Deposits (Works)		4,74,645	
External Scholarship		6,13,696	
C. S. I. R.		5,51,448	
Students Caution Deposits		21,125	
Miscellaneous Deposits		56,94,974	
QIP Programme organised by Government of India, Centre for Systems & Devices (Defence Ministry)		15,81,658	
Industrial Consultancy Work & Projects		1,06,29,775	
Cryogenics Engg. (Sub-Centre)		2,77,430	
			1,99,36,669
	C/o.		9,24,35,725

INDIAN INSTITUTE OF  
RECEIPTS AND PAYMENTS ACCOUNT

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RECEIPTS

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	Rs.	Rs.
B/F		10,73,93,863

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Total		10,73,93,863
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(Sd.) A. V. KARUNAKARAN NAMBIAR  
Finance & Accounts Officer



INDIAN INSTITUTE OF  
INCOME AND EXPENDITURE ACCOUNT

EXPENDITURE

	Rs.	Rs.
<b>Educational Expenses</b>		
<b>Pay of Teaching Staff</b>		
Department of Chemistry	8,15,260	
Physics	7,64,841	
Mathematics	5,19,941	
Humanities & Social Sciences	4,86,548	
Civil Engineering	8,74,490	
Mechanical Engineering	12,82,229	
Electrical Engineering	11,62,720	
Chemical Engineering	5,65,609	
Metallurgy	4,26,898	
Applied Mechanics	5,59,946	
Aeronautical Engineering Centres	4,32,577	
	2,49,796	
		81,40,855
<b>Pay of Non-Teaching Staff</b>		
Department of Chemistry	2,55,079	
Physics	4,66,068	
Mathematics	35,330	
Humanities & Social Sciences	65,453	
Civil Engineering	4,55,313	
Mechanical Engineering	9,19,082	
Electrical Engineering	6,45,143	
Chemical Engineering	3,58,372	
Metallurgy	3,12,241	
Applied Mechanics	2,53,912	
Aeronautical Engineering Centres	1,59,259	
	3,41,085	
Indo-German Projects	81,891	
	81,891	
		43,48,228
	C/o.	1,24,89,083

# TECHNOLOGY, MADRAS

FOR THE YEAR ENDED 31—3—1980

## INCOME

	Rs.	Rs.
<b>Grant from Government of India</b>		
(On Revenue Account)		
Regular Grant	2,57,18,000	
Ocean Engineering Grant	7,63,000	
		2,64,81,000
<b>General Income</b>		
Tuition Fees	4,39,924	
Hostel Seat Rent	2,13,473	
Gymkhana and Medical Fees	59,540	
Fines	3,924	
Examination Fees	54,385	
Degrees in Absentia	4,497	
Application Fees from students	6,32,671	
Application Fees for Appointments	4,961	
Admission Fees	36,234	
Grade Card	4,772	
		14,54,381
<b>Miscellaneous Receipts</b>		
Institute Bus Collection	2,95,789	
Hire Charges of Institute Vehicles	31,782	
Licence Fee	8,99,941	
Electricity, Water and Service Charges	2,91,866	
Lawns and Gardens (Auction sale of Trees, Usufructs, etc.)	30,325	
Other Receipts	21,60,043	
Income from the Computer Centre	38,43,607	
Central Photographic Section	18,047	
		75,71,400
Excess of Expenditure Over Income		71,04,221
		4,26,11,002
	C/o.	

INDIAN INSTITUTE OF  
INCOME AND EXPENDITURE ACCOUNT

EXPENDITURE

	Rs.	Rs.
B/F		1,24,89,083
<b>Departmental Expenses</b>		
Chemistry	2,87,132	
Physics	2,13,241	
Mathematics	25,645	
Humanities & Social Sciences	22,574	
Civil Engineering	1,66,516	
Mechanical Engineering	4,59,340	
Electrical Engineering	5,43,216	
Chemical Engineering	2,30,622	
Metallurgy	5,89,598	
Applied Mechanics	3,72,550	
Aeronautical Engineering	2,74,152	
	<u>                    </u>	31,84,586
<b>LIBRARY</b>		
<b>Pay and Allowances</b>		
Officers	1,09,406	
Establishment	3,92,917	
Contingencies-Operating cost	72,699	
Journals of General Interest	12,324	
Building Charges	41,430	
	<u>                    </u>	6,28,776
<b>Computer Centre</b>		
Pay and Allowances Officers	2,93,185	
Pay and Allowances Establishment	1,54,842	
Other Charges	15,25,392	
	<u>                    </u>	19,73,419
<b>Workshops</b>		
Pay and Allowances of Workshop Superintendent	52,171	
Pay and Allowances of Other Staff	10,94,837	
Working Expenses (Instruments, Tools, other Consumables)	1,49,248	
Stipend to Apprentices	40,902	
	<u>                    </u>	13,37,158
<b>Ocean Engineering Centre</b>		
Pay and Allowances	3,54,664	
Working Expenses (Instruments, & other consumables etc.)	2,06,504	
Sub-Centres	1,99,800	
	<u>                    </u>	7,60,968
C/o		<u>                    </u> 2,03,73,990

TECHNOLOGY, MADRAS  
FOR THE YEAR ENDED 31—3—1980

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INCOME

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	Rs.
B/F	4,26,11,002

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C/o.	4,26,11,002
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INDIAN INSTITUTE OF  
INCOME AND EXPENDITURE ACCOUNT

EXPENDITURE

	Rs.	Rs.
B/F.		2,03,73,990
<b>Energy Research Centre</b>	21,351	
Centre for Rural Development	23,688	
Special Instrument Laboratory (RSIC)	78,344	
Electron Microscope	44,918	
Electronic Instruments Servicing & Development Centre	7,779	
Central Photographic Section	42,601	
Central Glass Blowing Section	16,836	
A. C. Unit	27,517	
X-Ray Defraction Unit	46,431	
Fibre reinforced plastic Research Centre	59,952	
Television Engineering Lab	44,385	
Engineering Design Centre	28,627	
Material Sciences Research Centre	92,207	
Indo-German Project	1,77,497	
Indo-French Collaboration	3,075	
	7,15,208	
Pay and Allowances - C.R.D.		31,105
Pay and Allowances - Central Electronic Centre		1,05,390
Pay and Allowances - Air Conditioning Unit		70,502
<b>Institute Scholarships</b>		
Post Graduate and Research	29,81,134	
Under Graduate	8,27,762	
	38,08,896	
<b>N. C. C.</b>		
Pay and Allowances	49,725	
Other Expenditure	34,524	
	84,249	
<b>Athletic and Gymkhana</b>		
Pay and Allowances	25,280	
Other Expenditure	3,20,078	
	3,45,358	
Part time Lecturers	8,252	
Visiting Professors	19,839	
Technical Bulletin and Journals	40,929	
Symposia and Seminars	21,404	
Inplant Training Courses Visits	49,575	
Continuing Education Programme organised by the Institute	2,13,041	
	3,53,040	
C/o.		2,55,34,698

TECHNOLOGY, MADRAS  
FOR THE YEAR ENDED 31—3—1980

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INCOME

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	Rs.
B/F	4,26,11,002

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C/o.	4,26,11,002
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INDIAN INSTITUTE OF  
INCOME AND EXPENDITURE ACCOUNT

EXPENDITURE		
	Rs.	Rs.
B/F.	3,53,040	2,55,34,698
Quality Improvement Programme initiated by the Ministry of Education	10,322	
Director's Laboratory	---	
Director's Discretionary Fund for Research	222	
Membership fees to outside bodies	39,127	
Joint Entrance Examination	2,11,406	
Remuneration to External Examiners	43,107	
Convocation	59,057	
Prizes for Academic Distinction	1,020	
Common Examination for P. G. Admissions	1,74,092	
Contribution towards Institute participation in programmes of National Conference	5,000	
	8,96,393	
<b>Hostels</b>		
Allowances to Wardens		8,727
<b>Central Administration</b>		
(Pay and Allowances)		
Officers	3,40,737	
Establishment	20,30,640	
	23,71,377	
<b>Contingencies</b>		
Postage	1,76,281	
Entertainment	16,367	
Telephones	4,38,880	
Liveries	1,03,232	
Stationery	3,20,099	
Printing	88,305	
Advertisement	1,90,899	
Sundries (Miscellaneous Expenses)	2,16,170	
	15,80,233	
<b>Other Items</b>		
Director's Discretionary Fund	2,210	
General Stores	1,046	
	3,256	
C/o.		3,08,94,684

TECHNOLOGY, MADRAS  
FOR THE YEAR ENDED 31—3—1980

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INCOME

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	Rs.
B/F	4,26,11,002

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C/o.	4,26,11,002
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INDIAN INSTITUTE OF  
INCOME AND EXPENDITURE ACCOUNT

EXPENDITURE

	B/F	Rs.	Rs.
			3,03,94,684
<b>Stores</b>			
Pay and Allowances of Officers		26,279	
Pay and Allowances of Establishment		2,25,524	
		<hr/>	2,51,803
Security			2,17,125
Special Security Guards			1,54,175
<b>Lawns and Gardens</b>			
Pay and Allowances of the Horticultural Superintendent		18,646	
Wages to Labourers, Purchases of seeds etc.		2,87,104	
		<hr/>	3,05,750
Power			21,72,124
Mosquito Control			-----
Water Charges			10,12,515
Oil and Petrol			1,38,108
Repairs and maintenance of Furnitures			98,157
Duty Insurance and Road Taxes			36,749
Repairs and Maintenance-Motor Vehicles and Cycles			2,04,755
Fire Fighting-operating cost			4,376
<b>Works and Maintenance</b>			
Pay and Allowances of Officers		79,893	
Pay and Allowances of Establishment		7,09,573	
Other Charges		24,83,973	
		<hr/>	32,73,439
Property Tax		2,58,028	
<b>Hospital</b>			
Pay and Allowances of Medical Officers		1,39,193	
Pay and Allowances of Establishment		1,47,576	
Purchase of Medicines		4,37,868	
		<hr/>	7,24,637
	C/o.		<hr/>
			3,92,46,425

TECHNOLOGY, MADRAS  
FOR THE YEAR ENDED 31—3—1980

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INCOME

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	Rs.
B/F	4,26,11,002

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C/o.	4,26,11,002
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INDIAN INSTITUTE OF  
INCOME AND EXPENDITURE ACCOUNT

EXPENDITURE

B/F	Rs.	Rs.
		3,92,46,425
Grant to Vanavani High School		---
Repairs & Maintenance of Typewriter and Duplicators		48,072
Audit Charges		25,950
Legal Expenses		1,222
Honorarium to Legal Adviser		---
Honorarium to P. T. Liaison Officer		---
<b>Travelling Allowances</b>		
Board of Governors	9,155	
Selection Committee, Senate etc.	27,926	
Candidates called for interview	35,544	
External Examiners	67,099	
Joint Entrance Examination	22,407	
Common Examination for P. G. Admission	21,537	
		1,83,668
<b>Commitments under Indo-German Agreement</b>		
Customs Duty on Personal effects to West German Experts		61,398
Lodging Allowances to West German Experts		---
Subsidy to Hostels due to revision of salary to Hostel Employees		5,98,169
Employees Welfare Scheme		18,474
L. S. & P. C. on account of personnel of Foreign Service		7,866
G. P. F. Contribution etc.		23,87,870
Contribution to Societies		1,000
Campus Amenities		162
Cost of Institute Vehicles and Library books, written off		24,531
Taramani House Boarding & Lodging charges recoverable written off		5,061
Training and Welfare activities to Staff Members		---
Licence Fee recoverable written off		1,134
		Total Rs. 4,26,11,002

(Sd.) A. V. KARUNAKARAN NAMBIAR  
Finance & Accounts Officer

TECHNOLOGY, MADRAS

FOR THE YEAR ENDED 1979-80

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INCOME

---

	Rs.
B/F	4,26,11,002

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Total Rs. 4,26,11,002

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(Sd.) R. S. VIRMANI  
Registrar

(Sd.) P. V. INDIRESAN  
Director



INDIAN INSTITUTE OF

BALANCE SHEET AS

CAPITAL FUND AND LIABILITIES

	Rs.	Rs.	Rs.
<b>Capital Fund</b>			
Value of Land per contra		1,12,17,262	
Block Value of German aid per contra - Equipments	9,30,66,098		
Technical Books and Journals per contra	14,86,088		
		<u>9,45,52,186</u>	
<b>Computer Systems per contra</b>			
As per last balance sheet		1,54,50,458	
<b>Block Value of Gift from USA</b>			
Analogue Computer per contra		2,28,100	
Capital Grants and balance of income & expenditure accounts as on 31-3-1979	17,38,47,461		
Add: Capital Grant during 1979-80	2,12,10,000		
	<u>19,50,57,461</u>		
Less: Excess of Expenditure over Income for the year 1979-80	71,04,221		
		<u>18,79,53,240</u>	
Gymkhana Fund			30,94,01,246
Endowment Fund (Governor's Prizes etc.)			49,811
			<u>1,78,350</u>
<b>Deposits</b>			
Earnest Money, Caution and other Deposit		34,86,117	
Industrial consultancy centre & Projects		69,96,486	
		<u>1,04,82,603</u>	
<b>Sundry Creditors</b>			
On works Account		9,21,480	
For Supplies made or services rendered to Departments/ Sections		9,96,107	
		<u>19,17,587</u>	
<b>Outstanding Expenses Payable</b>			
(a) Pay and Allowances			15,21,548
(b) Scholarships			2,94,387
			<u>18,15,935</u>
		C/o.	<u>32,38,45,532</u>

TECHNOLOGY, MADRAS

AT 31-3-1980

PROPERTY AND ASSETS

	Rs.	Rs.	Rs.
<b>Land</b>			
Value of Land gifted by the Govt. of Tamil Nadu			1,12,17,262
<b>Buildings</b>			
Cost of completed Buildings as on 31-3-1979	8,63,79,205		
Add: Buildings completed during the year	56,63,689		
		9,20,42,894	
Building under construction as on 31-3-79	53,08,306		
Add: Expenditure for the year	58,73,302		
	1,11,81,608		
Less: Transferred to completed buildings account	56,63,689		
		55,17,919	
			9,75,60,813
Diesel Generator			2,14,232
<b>Equipments, Furniture &amp; Fittings</b>			
At cost as per balance sheet as at 31-3-1979		3,14,86,880	
Add: Additions during the year		1,28,23,849	
			4,43,10,729
Computer acquired through German Food Aid Funds under the Indo-German Agreement:			
At Cost as per balance sheet as on 31-3-80			1,54,50,458
Value of Analogue Computer received as gift from USA (Tools for freedom) per contra		2,28,100	
Add: Customs Duty, Insurance etc.		11,044	
			2,39,144
C/o.			16,89,92,638

INDIAN INSTITUTE OF

BALANCE SHEET AS

---

CAPITAL FUND AND LIABILITIES

---

	Rs.
	B/F 32,38,45,532
c) Other Allowance—Medical	26,865
d) Wages to N. M. R. Labourers - Departments etc.	76,323
e) Audit Fees	15,000
f) Stipend to Apprentices	3,600
g) Computer Receipts received in advance	13,148
<b>Excess Fees Refundable</b>	
Fees refundable on account of	
Scholarship and freeship as on 31-3-80	6,906
<b>American Chemical Society</b>	
<b>Account with First National City Bank</b>	
<b>New York Account (A)</b>	
Balance as per last year Balance Sheet	1,10,934

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C/o. 32,40,98,308

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TECHNOLOGY, MADRAS

AT 31-3-1980

PROPERTY AND ASSETS

	B/F	Rs.	Rs.	Rs.
				16,89,92,638
Block value of equipment from West Germany as per Balance Sheet as on 31-3-1979		8,89,17,803		
<i>Add</i> : Additions during the year.		<u>41,48,295</u>	9,30,66,098	
Customs duty and clearance charges on equipment from West Germany as per Balance Sheet as on 31-3-79		1,87,30,875		
<i>Add</i> : Customs duty paid during the year		<u>51,82,251</u>	<u>2,39,13,126</u>	11,69,79,224
Motor Vehicles at cost as per balance sheet as at 31-3-79			8,65,198	
<i>Less</i> : Sale Proceeds of Ambulance Van and Institute Bus		40,789		
Due to disposal of Ambulance Van and Institute Bus		<u>23,147</u>	<u>63,936</u>	
<i>Add</i> : Additions during the year			<u>8,01,262</u> <u>2,33,940</u>	10,35,202
Library Books and Scientific Journals at cost as on 31-3-79			93,58,344	
<i>Less</i> : Cost of Library Books written off during the year			<u>1,384</u>	
<i>Add</i> : Additions during the year			<u>93,56,960</u> <u>13,96,171</u>	1,07,53,131
Block value of technical books and Journals from West Germany as per Balance Sheet as at 31-3-79			13,93,118	
<i>Add</i> : Additions during the year			<u>92,970</u>	14,86,088
Typewriters and Duplicators at cost as per Balance Sheet as at 31-3-79			4,44,369	
<i>Add</i> : Additions during the year			<u>48,584</u>	4,92,953
			C/o	<u>29,97,39,236</u>

INDIAN INSTITUTE OF  
BALANCE SHEET AS

---

CAPITAL FUND AND LIABILITIES

---

	B/F	Rs.
Unpaid items as on 31-3-1980 as per undisbursed Pay Register		32,40,98,308
		40,115

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C/o.

32,41,38,423

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TECHNOLOGY, MADRAS

AT 31-3-1980

PROPERTY AND ASSETS

	B/F	Rs.	Rs.
			29,97,39,236
Tools and Plants works as at 31-3-1979		3,03,782	
<i>Add:</i> Additions during the year		20,609	
		<u>          </u>	3,24,391
Cycles at cost as per Balance Sheet as at 31-3-1979		24,999	
<i>Add:</i> Additions during the year		6,879	
		<u>          </u>	31,878
Investment Account, Endowment Fund Governor's Prize etc. as on 31-3-1980			1,78,350
<b>Stock as on 31-3-1980</b>			
Consumables stores with Department			28,78,566
Construction materials with Engineering Unit Works Account			25,43,553
Guest House Provisions			377
Stationery articles			1,15,562
Consumable Stores Central Stores			560
Tyres and Tubes, Spare Parts etc.			92,912
UNESCO Coupons			68,593
Gymkhana Assets (Projector and Tape Recorder at cost as per last year Balance Sheet)			49,811
Fees recoverable			29,138
Licence Fees etc. recoverable		65,331	
<i>Less:</i> Licence Fee recoverable written off		1,134	
		<u>          </u>	64,197
			<u>          </u>
	C/o		30,61,17,124

INDIAN INSTITUTE OF  
BALANCE SHEET AS

---

CAPITAL FUND AND LIABILITIES

---

	Rs.
B/F	32,41,38,423

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Total Rs. 32,41,38,423

(Sd.) A. V. KARUNAKARAN NAMBIAR  
Finance & Accounts Officer

TECHNOLOGY, MADRAS

AT 31—3—1980

PROPERTY AND ASSETS

	Rs.	Rs.	Rs.
	B/F		30,61,17,124
Income receivable for the Computer Centre			9,44,087
Industrial Research and Develop- ment Fund			36,510
Hire Charges of Institute Vehicles etc. recoverable			3,617
Water Charges due from water & Drainage Board			3,00,000
Prepaid Taxes etc.			8,436
Stamps on hand			14,021
C. P. F. Contribution recoverable			1,18,952
C. P. F. Interest on investments recoverable			14,66,020
Payments from grant received from the American Chemical Society Equipment as on 31-3-1980			1,10,934
<b>Advances and Deposits</b>			<b>14,55,255</b>
Works Advance			32,19,549
Other's (General)			
<b>Deposits with</b>			<b>3,05,580</b>
Tamil Nadu Electricity Board			
Collector of Customs			
— Air Cargo Complex		5,48,570	
—do— Account I		43,557	
—do— Account II		19,053	
		<u>6,11,180</u>	
<b>Unpaid Balance (per contra) with State Bank of India in 'C' Account</b>			
Cash on hand	40,115		
Imprest	500		
		40,615	
Cash on hand (other than 'C' A/c.)	1,79,791		
With State Bank of India	92,06,752		
		<u>93,86,543*</u>	
			94,27,158
<b>* Earnest Money, Caution &amp; Other Deposits</b>			
Industrial Consultancy & Projects	34,86,117		
	69,96,486		
	<u>1,04,82,603</u>		
<b>Less: Drawn from refundable deposits</b>			
	10,96,060		
	<u>93,86,543</u>		

Total Rs. 32,41,38,423

(Sd.) R. S. VIRMANI  
Registrar

(Sd.) P. V. INDIRESAN  
Director



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Printed at

**CENTRE FOR RURAL DEVELOPMENT PRINTING DIVISION**  
INDIAN INSTITUTE OF TECHNOLOGY