

**THIRTY SIXTH
ANNUAL REPORT
1994 - 95**



**INDIAN INSTITUTE OF TECHNOLOGY
MADRAS**

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CONTENTS

		Page No.
1	Report by the Director	1
2	Administration	6
3	Academic Programmes and Award of Degrees	16
4	Departments and Centres	20
5	Central Services	192
6	Student Amenities and Activities	197
7	Financial Assistance to Students	203
8	Weaker Section and Foreign Students	206
9	Finance and Accounts	208
10	Campus Amenities	211

THE VISITOR

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President of India

THE BOARD OF GOVERNORS

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Director of the Institute
Prof. N.V.C. Swamy

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Higher Education Department
Andhra Pradesh

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Madras

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Vice President
Tractors & Farm Equipment Ltd.
Madras

Sri P.K.Kandaswamy
Chief Engineer (Retd.)
Madras Port Trust
Madras

Sri T.K. Srinivasan
Chairman (Retd.)
Madhya Pradesh Electricity Board

Nominees of the Senate

Prof. P.S. Rao

Prof. R. Subramanian

Secretary

V. Shanmugam, Registrar

1 REPORT BY THE DIRECTOR

Indian Institute of Technology, Madras is one among the foremost Institutes of national importance in higher technological education in India. It has been growing from strength to strength ever since it obtained its charter from the Indian Parliament in 1961 and has established itself as a premier centre for teaching, research and industrial consultancy in the country.

The activities of the Institute encompass several departments and advanced research centres in various disciplines of Engineering and Science with nearly hundred Laboratories organised on an unique pattern of functioning.

A faculty of international repute, a brilliant student community, excellent technical and supporting staff and an effective administration have all contributed to the pre-eminent status of this Institute.

In the year 1994-95, the institute continues to maintain its tempo of activities. The salient features of those activities are given below:

1. Academic Programmes

The Institute offers a wide spectrum of programmes both at the under-graduates and post-graduates levels. At the under-graduate level, eight semester programme leading to the degree of Technology in 9 disciplines are offered. At the post-graduate level, a three semester - programme leading to the post graduate degree of technology in 36 disciplines are offered. Research programmes leading to award of MS and Ph.D degree are also offered.

1.1 Student Intake

In the year 1994-95, 948 students were admitted. This includes, 85 Ph.D, 103 M.S., 320 M.Tech, 79 M.Sc. and 361 B.Tech students. The number of women and SC/ST students admitted were 86 and 15 respectively.

1.2 Enrolment

The enrolment of students in the Academic year 1994-95 was 2817 which includes 228 SC/ST and 294 women students. This enrolment includes 497 Ph.D, 213 M.S., 581 M.Tech, 140 M.Sc., and 1386 B.Tech students/scholars.

2. Faculty Development

2.1 Faculty Position

There are 158 Professors, 68 Associate Professors, 127 Assistant Professors and 6 Lecturers totalling 359 in different departments and centres of this Institute. During the period under report 7 faculty positions were filled.

2.2 Grant of Sabbatical Leave

During the period under report 17 faculty members went on Earned leave/sabbatical leave/extra-ordinary leave for taking up various assignments.

2.3 Visits Abroad

63 Faculty members visited foreign countries for various academic activities.

2.4 Publications

During the period under report 927 papers were published by the faculty members of which 291 papers were in Mechanical Science 43 papers in Electrical Science, 30 papers in Chemical Science, 105 papers in Building Science, 136 papers in Mathematical and Physical Sciences and 322 papers in other subjects.

2.5 Faculty Attending Conference/Seminar

Faculty members are keen and take effective steps for interaction with other educational institutions. During the period under report 72 faculty members participated in various conferences, seminars and symposiums conducted by other organisations/Universities.

2.6 Honours conferred on Faculty

The following faculty members were awarded prizes by various organisations for their research work:

- Prof H Suresh Rao, Department of Civil Engineering was awarded a Certificate of Merit by Central Board of Irrigation and Power for his Research paper (co-authored) on Groundwater, entitled Numerical Simulation of Pumping and Recharge Well Fields - A Case Study.
- Prof B Viswanathan, Department of Chemistry was awarded Tamil Nadu scientist Award - 1994.
- Prof Surjit Singh, Department of Chemistry was awarded Asundi Memorial Lecture Award - 1994 by the Indian National Science Academy.
- Prof S Sundaraesan, Department of Metallurgical Engineering received the Panthaki Award of the Indian Institute of Welding for the best paper at the National Welding Seminar in December 1993.
- Prof V Damodara Das, Department of Physics had been selected for award of the Marie Curie Fellowship of the Commission of the European Communities under the auspices of international Scientific Co-operation Initiative.
- Prof H N Mahabala and his team developed an expert system under the project sponsored by IITM-ISRO Cell which was tested in real-time and found to operate satisfactorily during the successful launch of PSLV-D2 on 15th October 1994.
- Prof P K Philip and Prof M S Shunmugam, Department of Mechanical Engineering received the award of Production Engineering Division Gold Medal 1993-94 for a paper entitled "Surface modification using electric discharge machining" by the Institution of Engineers (India).
- Prof R Natarajan, Department of Mechanical Engineering was awarded ISTE Baroda Chapter Award for the best paper published in the Indian Journal of Technical Education by Teachers in 1993 and Sir Rajendra Nath Mookerjee Memorial Prize 1993-94 by the Institution of Engineers (India) for his paper entitled Combustion-Generated Air Pollution.
- Prof M S Ananth, Department of Chemical Engineering was awarded Herdillia Award for "Excellence in Basic Research in Chemical Engineering" for 1994 by the Indian Institute of Chemical Engineers (IIChE).
- Prof U S P Shet, Department of Mechanical Engineering, Dr S Swarnamani and Prof B V A Rao, (Retd.) Department of Applied Mechanics were adjudged to receive the Sir C V Hamari Award for the paper entitled "Combustion Noise of LPG Free Jet Flames issuing from a Nozzle-mix Shear Burner" by the Acoustical Society of India (ASI) for the best article contributed to the journal of ASI during the year 1992.
- Prof P A Aswathanarayana, Department of Applied Mechanics and Prof K N Seetharamu, Department of Mechanical Engineering were awarded DR M G Deshpande Memorial Prize for the best paper entitled "Numerical Simulation of Vortex Shedding Behind Bluff Bodies".

2.7 Short-term courses conducted

The faculty of various departments and centres of this Institute conducted 8 Short-term courses during the period under report.

2.8 Conference/Seminars/Symposia Conducted

A large number of conference, seminars, symposiums, short term courses are regularly organised at this Institute. During the period under report 41 Short Courses, Seminars, symposia / workshop and Conference National / International Conferences were conducted.

3. STUDENT FACILITIES

3.1 Student Council

The students council, an elected body from among the student community provides an effective channel of communication among the Director, faculty and students, through dialogue and discussion on various student matters. Student council is also responsible for certain welfare measures organized on voluntary basis by the student community. The publication of Focus, campus magazine of the students is one of the activities of the students council.

3.2 Adhoc Grant for Research Scholars

To encourage the research scholars of M.S. and Ph.D programmes the Institute has been sanctioning adhoc grants for those who participate in International conference and present papers. During the period under report 7 scholars were sanctioned this grant. In the last 10 years, 62 scholars have benefitted under this scheme.

3.3 Thesis Preparation Grant

Research scholars have been sanctioned a sum of Rs.2500/- for preparation of thesis. During the period under report 15 Ph.D scholars benefitted in this scheme.

3.4 Award of Medals

In the academic year 1994-95, 37 students obtained medals for their outstanding academic performance in various discipline.

3.5 Scholarship

During the period under report 55 Ph.D scholars, 73 MS scholas and 237 M.Tech students were given fellowship/ scholarship. Institute merit-cum-means scholarship was given to 8 B.Tech. students. Institute merit scholarship was given to 22 M.Sc., students. In total 310 Ph.D, 206 M.S scholas and 465 M.Tech students were granted fellowship/scholarship. Further 61 M.Sc. students got institute merit scholarship and 51 B.Tech. students got Institute merit-cum-means scholarship.

3.6 Facility for SC/ST Students

During the period under report 8 B.Tech students of SC/ST community were given free messing facilities and out of pocket expenses of Rs.70/- per month, in addition to the exemption of tuition fees. With this 27 students enjoyed this facility during the period under report. Further 51 students got tuition fee exemption.

3.7 Student Welfare Fund

This is a cooperative scheme by way of subscription by every student per annum to assist needy and deserving students through loan to meet tuition fees, study tour expenses, cost of books, thesis expenses etc. During the period under report 1 student got benefitted.

3.8 Placement

The placement and training centre of the Institute contacts Medium and Large Scale Industries, National and Defence Laboratories and Universities all over the country and provides placements to the freshers, Scientists and Engineers from various discipline. During the period under report large number of students were selected by well known organisations before they actually leave the campus after completing the course. This centre has been able to achieve this almost every year.

4. Degrees Awarded

31st Convocation was held on 30th July 1994. Dr. Manmohan Singh, Minister for Finance, Government of India, delivered the Convocation Address. 735 candidates were awarded various degrees. With this the total number of candidates who were awarded degrees so far by this Institute is 17,684.

5. Industrial Consultancy & Sponsored Research Programmes

5.1 Sponsored Projects

During the period under report 65 sponsored projects to the value of Rs.925.00 crores were handled.

5.2 Consultancy

Industries from all sectors avail the expertise and facilities of this Institute through any one of the following avenues:

- * Institutional Consultancy
- * Retainer Consultancy
- * Research Based Industrial Consultancy

The value of the consultancy assignments taken up in 1994-95 was Rs.263.08 lakhs.

5.3 Retainer Consultancy

Expertise of IIT faculty is utilised by the Industries by retaining them as consultants for advice/guidance on any aspects of interest to the industries concerned for a specific duration. More than thirty faculties were retained as consultants by various industries from all over the country and availed this expertise.

5.4 Research Based Industrial Constancy

Assignments which require applied research fall under this category. Under RBIC an industry or a group of industries can jointly sponsor a project of interest to them in an area where they agree to share the know-how generated. The project duration will be for a period ranging from six months to three years. During 1994-95 more than twenty companies entered into an agreement for pursuing projects under this programme.

5.5 Industrial Associateship Scheme

The Industrial Associateship Scheme was started in 1987 to further strengthen the linkages with the industry. At present more than three hundred industries/organisations from all over the country are members of this scheme. The institute, under this Scheme, provide access to the following facilities to their Industrial Associates.

- * Technology Appreciation Programmes (TAP)
- * Technology Requirement Programmes (TRP)
- * Library and Information Services
- * Short term courses
- * Get-together Programmes

During the period under report 6 Technology Appreciation Programmes were organised.

6. Centre for Continuing Education

The centre for continuing education has initiated a wide range of activities by utilising the resources of faculty as well as other facilities available at the Institute. During the period under report teachers from various colleges were admitted in the Ph.D and M.Tech programmes under Quality Improvement Programme.

The Centre for Continuing Education during the period under report conducted 8 summer/winter schools for teachers of Engineering Institutions.

14 Ph.D. scholars and 19 M.Tech. scholars were admitted under QIP programme. So far about 237 scholars have been awarded Ph.D. degree and 318 awarded M.Tech. degree.

During the year 1994-95, 22 Continuing Education programmes were conducted and about 435 participants attended these programmes.

7. Hostel

The strength of students in 12 hostels was 2015 which includes 198 women students.

8. Finance

The non-plan revised estimate and budget estimate for 1994- 95 were Rs.3,088-64 lakhs and Rs.3,281-05 respectively. The plan revised estimate and budget estimate were Rs.412.92 and Rs.300.00 respectively.

9. Library

The Central Library had 2,23,591 volumes of books and journals and periodicals as on 31-3-1995. During the period under report 1,64,320 readers visited the library.

2. ADMINISTRATION

2.1 General

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

The Senate decides the academic policy of the Institute. It approves and controls curriculum, courses, examination and declaration of results. It appoints committees to look into specific academic matters arising from time to time. The teaching, training and research activities of various departments at the Institute are constantly under review to improve both facilities and standards. The Director of the Institute is the Chairman of the Senate. Members of the Senate are listed in Annexure II.

Financial advice to the Institute is given by the Finance Committee, whose constitution is given in Annexure II. The Buildings and Works Committee advises the Institute on matters relating to buildings and works activity. The constitution of this committee is also given in Annexure II.

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

2.2 Staff Position

During the year 359 Faculty, 41 Scientific Officers, 56 Officers, and 1919 supporting staff were in position. 30 new appointments for higher positions were made. 47 Faculty/Officers retired from their services, 1 resigned, 8 expired and 5 Visiting Faculty were relieved. During the period under report 17 faculty and other staff were on long leave. The details of them are given below:

Faculty/Officers Appointed during the year:

S.No.	Name and Department	Designation	Date of Appointment
1.	Dr.Mrs.Sujatha Chandramohan Applied Mechanics	Asst.Professor	02.06.94
2.	Dr.K.Ramamurthy Civil Engineering	Asst.Professor	02.06.94
3.	Dr.K.N.Satyanarayana Civil Engineering	Asst.Professor	02.06.94
4.	Sri N.Devasagayam, RSIC	S.O. Gr.II(on contract)	02.06.94
5.	Dr. M.Myrajan, RSIC	S.O. Gr.II(on contract)	02.06.94
6.	Dr.R.Murugesan, RSIC	S.O. Gr.II(on contract)	02.06.94

S.No.	Name and Department	Designation	Date of Appointment
7.	Sri G.R.Raghunatha Rao Acad. Section	Dy.Registrar	02.06.94
8.	Sri K.Gopalan, Admn.II	Asst.Registrar	02.06.94
9.	Sri V.Ganesan, Admn.III	Asst.Registrar	02.06.94
10.	Sri K.Chidambaram Finance & Accounts	Asst.Registrar	02.06.94
11.	Sri P.Paramanandam Finance & Accounts	Asst.Registrar	02.06.94
12.	Dr.Krithi Ramamritham Comp.Sci. & Engg	Visiting Prof.(one year)	13.06.94
13.	Dr. A.Mahalakshmi Institute Hospital	Medical Officer	23.06.94
14.	Dr. P.Sriram Aerospace Engg.	Visiting Faculty	27.06.94
15.	Dr. Rama B.Bhat Applied Mechanics	Visiting Prof.(one year)	01.07.94
16.	Dr. S.Chilukuri Physics	Visiting Faculty (One Semester)	12.07.94
17.	Dr.Devendra Jalihal Electrical Engg.	Visiting Faculty (One year)	14.07.94
18.	Dr. S.Devaki Reddy Hum.&Soc. Sciences	Part-time Faculty in English (2 semesters)	08.08.94
19.	Sri Banavath Baman Computer Centre	Asst.Systems Engineer	22.08.94
20.	Sri P.Y.Sreekumar Computer Centre	Jr.Systems Engineer	26.08.94
21.	Sri Santhosh Arvind Computer Centre	Asst.Systems Officer	07.09.94
22.	Sri S.Ramalingam Computer Centre	Jr.Systems Engineer	28.09.94
23.	Dr. J.Ravi Prakash Chemical Engg.	Visiting Faculty (Six months)	20.10.94
24.	Dr. S.Jayanthi Chemical Engg.	Visiting Faculty (One year)	08.11.94
25.	Dr.Bimalendu Guha Metallurgical Engg.	Asst.Professor	08.11.94
26.	Dr.V.Anantha Subramanian Ocean Engg. Centre	Asst.Professor	08.11.94
27.	Dr.R.Natarajan Ocean Engg. Centre	Asst.Professor	08.11.94
28.	Dr.C.Lakshmana Rao Applied Mechanics	Asst.Professor	30.11.94
29.	Dr. Harish Chandra Central Library	Librarian	04.01.95
30.	Mrs.Prema Chakrapani Admn.II	Superintendent	17.02.95

Faculty /Officers who have retired/resigned during the year:

Sl.No.	Name and Department	Designation	Date of Retirement	Remarks
1.	Dr.(Mrs)Subashree Hospital	Jr.Medical Officer	30.04.94	On the expiry of term of appt.
2.	Dr.R.Narayan Chemistry	Professor	31.05.94	Retired & Re- employed upto 30.06.94.
3.	Dr.V.S.Kumar Hum. & Soc. Sciences	Asst.Professor	31.05.94	Retired & Re-employed upto 30.06.94.
4.	Sri N.Krishnamurthy Acad. Section	Superintendent	10.05.94	Vol.Retirement
5.	Dr.C.F.Starmar Applied Mechanics	Visiting Professor	02.05.94	Relieved
6.	Dr.C.K.Narayanaswamy Physics	Professor	30.05.94	Relieved from Re-employment tenure at request
7.	Dr.R.Nagarajan Comp.Sci. & Engg.	Professor	10.06.94	Relieved from Re-employment tenure at request
8.	Dr.R.Narayan Chemistry	Professor	30.06.94	On expiry of Re-employment tenure
9.	Dr.R.S.Srinivasan Applied Mechanics	Professor	30.06.94	On expiry of Re-employment tenure
10.	Dr.V.Mahadeva Iyer Chemistry	Professor	30.06.94	On expiry of Re-employment tenure
11.	Dr.V.G.K.Murti Electrical Engg.	Professor	30.06.94	On expiry of Re-employment tenure
12.	Dr.V.S.Kumar Hum. & Soc. Sciences	Asst.Professor	30.06.94	On expiry of Re-employment tenure
13.	Dr.K.R.Parthasarathy Mathematics	Professor	30.06.94	On expiry of Re-employment tenure
14.	Dr.M.A.Parameswaran Mechanical Engg.	Professor	30.06.94	On expiry of Re-employment tenure
15.	Dr.K.V.Thyagarajan Mechanical Engg.	Asst.Professor	30.06.94	On expiry of Re-employment tenure
16.	Dr.V.Seshadri Electrical Engg.	Professor	30.06.94	Relieved on Superannuation
17.	Sri G.R.Raghunatha Rao Acad. Section	Dy.Registrar	30.06.94	Relieved on Superannuation
18.	Sri V.Md.Nizar Ahmad IC & SR	Superintendent	30.06.94	Relieved on Superannuation
19.	Sri S.Ramamurthy Ocean Engg. Centre	Supdt.(Stores)	30.06.94	Relieved on Superannuation
20.	Sri E.R.Narasimhan Accounts	Superintendent	30.06.94	Relieved on Superannuation
21.	Dr.K.Sankara Rao Electrical Engg.	Visiting Prof.	01.07.94	Relieved on expiry of term
22.	Dr.D.Ganapath Ram Sharma Metallurgical Engg.	Asst.Professor	02.07.92	Resigned and deemed to have been relieved
23.	Dr.C.Kalidas Chemistry	Professor	31.07.94	Retired on Superannuation & Re-employed upto 30.06.95.

Sl.No.	Name and Department	Designation	Date of Retirement	Remarks
24.	Sri M.C.James Central Stores	ASPO(SG)	31.07.94	Relieved on Superannuation
25.	Sri A.Srinivasan Central Stores	Supdt.(Stores)	31.07.94	Relieved on Superannuation
26.	Sri T.Varadarajan Placement Office	Secretary	31.07.94	Relieved on Superannuation
27.	Sri K.Rangarajan Admn.II	Asst.Registrar	01.08.94	On Vol.Retirement
28.	Dr.M.A.Veluswami Mech. Engg.	Professor	31.08.94	Retired on superannuation & Re-employed upto 30.06.95
29.	Dr.A.Baradarajan Chemical Engg.	Professor	31.08.94	Retired on Superannuation & Re-employed upto 30.06.95.
30.	Dr.C.N.Pillai Chemistry	Professor	31.08.94	-do-
31.	Smt Savithri Subramaniam Aerospace Engg.	Superintendent	01.09.94	On Vol.Retirement
32.	Sri G.Prabhudas Hospital	Pharmacist-cum- SK (SG)	16.09.94	On Vol.Retirement
33.	Dr.(Ms)Sadhana Saraswathy Hospital	Jr.Medical Officer	19.09.94	On expiry of (Adhoc) tenure
34.	Sri V.Chalapathy Accounts Section	Superintendent	21.09.94	On Vol.Retirement
35.	Sri P.Manickavasagam Engg. Unit	Hort.Supdt. (SG)	30.09.94	Relieved on Superannuation
36.	Dr.S.B.S.Sastry Physics	Professor	30.09.94	Retired on superannuation & Re-employed upto 30.06.95
37.	Dr.B.Ramaswamy Electrical Engg.	Professor	30.09.94	-do-
38.	Dr.C.Lakshmana Rao Applied Mechanics	Visiting Faculty	29.11.94	To takeup the appt. as AP
39.	Dr.P.S.Srinivasan Applied Mechanics	Professor	30.11.94	Retired on Superannuation & Re-employed upto 30.6.95.
40.	Dr.R.Subramanian Chemical Engg.	Asst.Professor	30.11.94	Retired on superannuation & Re-employed upto 30.06.95
41.	Dr.R.Aravind Electrical Engg.	Visiting Faculty	07.12.94	Relieved on request
42.	Dr.S.Chilukuri Physics	Visiting Faculty	31.12.94	On expiry of tenure
43.	Sri R.Sreenivasan Mechanical Engg.	Technical Officer	31.12.94	Relieved on Superannuation
44.	Sri S.Kalyanasundaram Accounts Section	Superintendent	31.12.94	-do-
45.	Dr.H.N.Mahabala Comp. Sci. & Engg.	Professor	31.12.94	Retired on Superannuation & Re-employed upto 31.01.95 and relieved
46.	Sri T.E.Srinivasan Chemistry	Superintendent	02.01.95	On Vol.Retirement
47.	Dr.D.Prithviraj Mechanical Engg.	Professor	01.02.95	-do-

Sl.No.	Name and Department	Designation	Date of Retirement	Remarks
48.	Dr.J.Sobhanadri Physics	Professor	28.02.95	Retired on superannuation & Re-employed upto 30.06.95
49.	Dr.P.Krishna Iyer Applied Mechanics	Asst.Professor	28.02.95	-do-
50.	Sri V.Raman Civil Engg.	Technical Officer	28.02.95	Relieved on Superannuation
51.	Sri DVVSR Anjaneyulu Mechanical Engg.	Supdt.(Stores)	28.02.95	-do-
52.	Sri M.M.A.Quraishi Met. Engg.	Foreman	31.03.95	-do-

Faculty/Officers Expired during the year:

Sl.No.	Name/Department	Designation	Date of Death
1.	Smt.Usha Krishnan Central Library	Sr.Prof.Asst (SG)	05.04.94
2.	Sri K.Bhaskaran Electrical Engg.	Foreman (SG)	06.05.94
3.	Dr.N.Venkatarayulu Mechanical Engg.	Professor	10.08.94
4.	Sri C.K.Vijayan Ocean Engg.Centre	S.S.O. II	18.08.94
5.	Dr.R.S.Alwar Applied Mechanics	Professor	14.11.94
6.	Dr.A.Rama Mohana Rao Mechanical Engg.	Professor	03.01.95
7.	Sri K.Parthasarathy A.C. Unit	Sr.Maint.Engr.	06.01.95
8.	Dr.K.Rama Koteeswara Rao Mechanical Engg.	Professor	06.02.95

Faculty/Officers who were on long leave:

S.No.	Name	Designation	Duration	Nature of Leave
1.	Sri V.K.Ranganathan CEC	S.T.A.	2 Years	Extra-Ordinary Leave wef June'94
2.	Dr.R.S.Alwar Applied Mechanics	Professor	1.7.94 to 14.11.94	Leave at Credit
3.	Dr.K.A.Padmanabhan Metallurgical Engg.	Professor	1.8.94 to 31.7.95	Sabbatical Leave
4.	Sri M.Philip AC Unit	Sr.Mech.	25.6.94 to 24.6.96	Extra- Ordinary Leave
5.	Dr.P.Seshasayi Computer Centre	Manager	6.2.95 to 5.2.96	Extra-Ordinary Leave
6.	Dr.M.Mukunda Rao Electrical Engg.	Professor	9.1.95 to 7.7.95	Sabbatical Leave

S.No.	Name	Designation	Duration	Nature of Leave
7.	Dr.K.K.Balasubramanian Chemistry	Professor	1.12.94 to 30.12.94	EL in continuation of Sab.Leave from 1.12.93
8.	Sri T.R.Santhanakrishnan Hospital	Pharmacist (SG)	31.8.94 to 30.8.96	Extra-Ordinary Leave
9.	Dr.(Mrs)Geetha Ramakrishnan RSIC	S.T.A.	29.10.94 to 27.10.95	Extn.of EOL
10.	Dr.P.R.Vaya Electrical Engg.	P.S.O.	1.7.94 to 30.6.95	Extra-ordinary Leave
11.	Dr.Dipak Chaudhuri Hum. & Soc. Sciences	Professor	9.5.94 to 8.5.96	-do-
12.	Dr.B.Nagalingam Mechanical Engg.	Professor	1.4.94 to 22.6.94	Extension of Sab.Leave from 1.4.93 to 31.3.94.
13.	Dr.K.Hariharan Physics	Asst.Professor	6.5.94 to 31.8.94	EL in continuation of Sab.Leave from 6.5.93 to 5.5.94.
14.	Dr.V.M.Krishna Sastri Mechanical Engg.	Professor	11.6.94 to 14.9.94	EL in continuation of Sab.Leave from 11.6.93 to 10.6.94.
15.	Dr.O.V.K.Chetty Mechanical Engg.	Professor	12.12.94 to 11.12.96	Extra-Ordinary Leave
16.	Dr.S.K Rakshit Chemical Engg.	Asst.Professor	23.12.94 to 21.05.96	Extra-Ordinary Leave
17.	Dr.O.Prabhakar Metallurgical Engg.	Asst.Professor	2.1.95 to 1.1.96	Extra-Ordinary Leave

2.3 Meetings of the Bodies:

Board of Governors

Four meetings of the Board of Governors were held on 2.6.94, 29.7.94, 8.11.94 and 17.2.95.

Finance Committee

Two meetings of the Finance Committee were held on 15.4.94 and 7.11.94.

Senate

Four meetings of the senate were held on 27.5.94, 22.7.94, 12.12.94 and 13.3.95.

Board of Academic Courses

Three meetings of the Board of Academic Courses were held on 16.5.94, 28.9.94 and 13.2.95.

Board of Academic Research

Two meetings of the Board of Academic Research were held on 18.5.94 and 14.11.94.

Building and Works Committee

One meeting of the Building and Works Committee was held on 9.12.94.

Board of Industrial Consultancy & Sponsored Research

Seven meetings of the Board of Industrial Consultancy and Sponsored Research were held on 11.4.94, 24.6.94, 29.8.94, 31.10.94, 3.1.95, 3.2.95 and 29.3.95.

**DIRECTOR
N.V.C.SWAMY**

DEANS

Academic Courses	C.R.Muthukrishnan
Academic Research	C.S.Krishnamoorthy
Administration	Y.Narayana Rao
Industrial Consultancy & Sponsored Research	V.S.Raju (Till 6.1.95) K.V.S.Rama Rao (From 23.1.95)
Students	N.Venkatrayulu (Till 10.8.94) P.Srinivasa Rao (From 18.1.95)

HEADS OF DEPARTMENTS

Aerospace Engineering	E.G. Tulapurkara
Applied Mechanics	B.S.Prabhu
Chemical Engineering	Ch.Durga Prasada Rao
Chemistry	M.R. Udupa
Civil Engineering	N.Rajagopalan
Computer Science & Engg.	(Mrs.) Kamala Krithivasan
Electrical Engineering	K.Radhakrishna Rao
Humanities & Social Sciences	R.Rajagopalan
Mathematics	S.N.Majhi
Mechanical Engineering	R.Natarajan
Metallurgical Engineering	K.J.L. Iyer
Ocean Engineering Centre	M.R.Pranesh
Physics	G.Rangarajan

HEADS OF CENTRES

Computer Centre	C.R.Muthukrishnan
Fibre Reinforced Plastic Research Centre	N.G.Nair
Material Science & Research Centre	K.V.S.Rama Rao
Regional Sophisticated Research Centre	P. T.Manoharan

CENTRAL ADMINISTRATION

Director	N.V.C. Swamy
Registrar	V.Shanmugam
Deputy Registrars (Academic)	K.Panchalan
(Finance & Accounts)	R. Kannan
(Stores & Purchase)	A.Thirunavukkarasu
(Trg. & Placement)	A.K.Pattabiraman
Secretary (SG) to Director	V.V. Natarajan
Secretary to Director	G.Natarajan

Assistant Registrars (SG)
(Academic)

K.Sekar

(Stores & Purchase)

M.Manickam

Assistant Registrars
(Audit)

R.N.Sankaran

(IC & SR)

K.R.Raghavan

(Hostels)

K.Ramaswamy

(Admn.II)

K.Gopalan

(Admn.III)

V.Ganesan

(Fin. & Accts)

V.Ramamurthy

(Fin. & Accts)

G.Srinivasulu

(Fin. & Accts)

R.Esakkimuthu

(Fin. & Accts)

P.Paramanandam

(Fin. & Accts)

K.Chidambaram

Chief Security Officer (In-charge)

G.Selvamani

Engineering Unit

Institute Engineer

N.Malayalam

Executive Engineers

C.Ganesan
D.Ramanathan

Assistant Engineer (SG)

M.Doorvasalu Reddy

Assistant Engineers

A.Angamuthu
J.C.Jinadass
S.K.Pati
K.Ramakrishnan
A.Sardar Jhan
S.Swaminathan
R.M.Parameswaran
F.John De Britto

LIST OF OTHER OFFICERS

Central Library
Professor-in-charge

Dr. V.Sivaramakrishnan

Librarian

Dr. Harish Chandra

Deputy Librarians

Sri R.Vengan
Sri M.Koteswara Rao

Assistant Librarians

Sri K.Sankaran
Sri M.Murugan
Sri C.C.Tom
Sri C.R.Sekar

Senior Professional Assistant

Kum. D.Sobha Rao
Sri P.N.Swamy
Sri R.K.Sankaran
Sri P.Natarajan
Smt Tapati Datta
Sri K.Sethu
Mrs. Lalitha Rajendran
Sri K.Kamaraj
Sri N.Gnanasekaran
Sri K.Bhasker Rao
Sri T.Ramakrishnan

Central Electronics Centre

Chief Instrument Engineer Sri T.N.Ranganathan

Industrial Consultancy & Sponsored Research

Dean Dr. K.V.S. Rama Rao

Chief Techno-Economic Officer Dr. D.Balakrishnan

Senior Techno-Economic Officers Sri Y.G.Narasimha
Sri R.Sundaram

Central Workshop

Senior Workshop Superintendent Sri S.Jambunathan

Asst. Workshop Superintendent Sri N.L.N.N.Kumar

Technical Officer (SG) Sri G.S.Ramachandran
Sri A.V.Sundaram

Centre for Continuing Education

Chairman Dr.V.Kalyanaraman

Central Glass Blowing Section

Head Dr.C.S.Venkatachalam

Central Photographic Section

Convenor Dr.S.Santhakumar

Central Gas Supplies Unit

Head Dr.K.K. Balasubramanian

Airconditioning Unit

Head Dr.K.A.Bhaskaran

Technical Officer Shri S.Krishnaswamy

Sports Activities

Adviser Dr.S.S.Gokhale

Cultural Activities

Adviser Dr.A.K.Kolar

National Cadet Corps

Officer Commanding 4(TN)AIR SQN B.P. Lohani
(TECH) N.C.C.

Training and Placement

Adviser Prof.A.Venkatesh

Foreign & Weaker Section Students

Adviser

Prof.R.Raman

Vigilance

Chief Vigilance Officer

Prof.P.Sankaran

Guldance & Counselling

Head

Prof.B.Viswanathan

Journal of Mathematica and Physical Sciences

Editor-in-Chief

Prof.G.Subramanian

N.S.S.

Co-ordinator

Prof.K.V.Gopalakrishnan

3. ACADEMIC PROGRAMMES AND AWARD OF DEGREES

3.1 Introduction

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

3.2 Admissions 1994-95

Students for B.Tech and M.Tech programmes were selected through JEE and GATE respectively. Selection for Ph.D., M.S. programmes was done through interview/test. For M.Sc., programme selection is done by written test and/or interview.

The number of students and scholars admitted to various courses during 1994-95 are given in Table 1.

TABLE - 1

Sl.No.	Department	B.Tech	M.Tech	M.Sc	M.S	Ph.D	Total
1.	Aerospace Engg.	24	7	-	7	1	39
2.	Applied Mechanics	-	11	-	10	7	28
3.	Chemical Engg.	46	24	-	10	3	83
4.	Chemistry	-	-	27	-	19	46
5.	Civil Engg.	48	43	-	10	7	108
6.	Computer Sci.Engg	27	44	-	20	2	93
7.	Electrical Engg.	80	48	-	22	6	156
8.	Hum. & Soc.Sciences	-	23	-	4	5	32
9.	Mathematics	-	-	27	-	5	32
10.	Mechanical Engg.	84	83	-	13	17	197
11.	Metallurgical Engg.	31	12	-	3	2	48
12.	Ocean Engg. Centre	21	11	-	4	4	40
13.	Physics	-	14	25	-	7	46
	Total	361	320	79	103	85	948

The total 948 includes the following:

Foreign Nationals	13	QIP Scholars (Ph.D & M.Tech.)	32
Scheduled Castes	86	Sponsored Candidates (M.Tech.& MS)	39
Scheduled Tribes	15	Project Staff (MS & Ph.D)	30
Women	106	External Registration (MS & Ph.D)	30 (in residence)

3.3 Students/Scholars Enrolment

The total number of students on roll in various programmes of the Institute in the academic year 1994-95 are given in Table 2.

TABLE - 2

S.No.	Department	B.Tech	M.Tech	M.Sc.	M.S.	Ph.D	Total
1.	Aerospace Engg.	86	9	-	13	15	123
2.	Applied Mechanics	-	24	-	24	39	87
3.	Chemical Engg.	194	37	-	16	45	292
4.	Chemistry	-	-	50	-	111	161
5.	Civil Engg.	179	72	-	24	39	314
6.	Computer Sci & Engg.	113	83	-	39	17	252
7.	Electrical Engg.	298	86	-	41	19	444
8.	Hum. & Soc. Sciences	-	50	-	9	24	83
9.	Mathematics	-	-	50	-	25	75
10.	Mechanical Engg.	326	159	-	35	62	582
11.	Metallurgical Engg.	115	21	-	5	21	162
12.	Ocean Engg. Centre	75	14	-	7	26	122
13.	Physics	-	26	40	-	54	120
	Total	1386	581	140	213	497	2817

The total 2817 includes the following:

Foreign Nationals	55	Project Staff (MS & Ph.D)	102
Scheduled Castes	190	Defence (M.Tech.)	25
Scheduled Tribes	38	CSIR (Ph.D.)	32
Women	294	Handicapped	2
QIP Scholars	80	Institute staff (MS & Ph.D)	17
Sponsored Candidates	77	External Registration (MS & Ph.D)	15 (in residence)

3.4 Convocation

31st Convocation was held on 30.7.1994. Dr. Manmohan Singh, Finance Minister, Govt. of India, delivered the Convocation Address. 735 candidates were awarded various degrees. 521 candidates received degrees in person. The details of programme/department wise degree awarded are given in the following Table-3.

TABLE - 3

S.No.	Department	B.Tech	M.Tech	M.Sc.	M.S.	Ph.D	Total
1.	Aerospace Engg.	15	10	-	-	2	27
2.	Applied Mechanics	-	13	-	6	8	27
3.	Chemical Engg.	31	19	-	2	10	62
4.	Chemistry	-	-	21	-	10	31
5.	Civil Engg.	26	35	-	7	5	73
6.	Computer Sci & Engg.	26	36	-	12	4	78
7.	Electrical Engg.	64	39	-	7	6	116
8.	Hum. & Soc. Sciences	-	14	-	3	1	18
9.	Mathematics	-	-	27	-	7	34
10.	Mechanical Engg.	75	55	-	11	16	157
11.	Metallurgical Engg.	24	5	-	3	11	43
12.	Ocean Engg.Centre	11	7	-	5	6	29
13.	Physics	-	6	2	9	-	5
	Total	272	239	77	56	91	735

With this Convocation the number of degrees awarded so far by the Institute is 17,684, the details of which are as follows:

Ph.D	---	1638	M.S.	---	964
B.Tech	---	7761	M.Tech	---	5800
M.Sc.	---	1256	DIIT	---	245
B.Sc.(TA)	---	20			

3.5 Award of Prizes

The following are the details of award of Prizes for the students with the best academic records in each course:

President of India Prize

B.Tech - Electronics and Communication Engineering - R.Ranjit

Governor's Prize

B.Tech - Mechanical Engineering, Prashanth Vasu

OTHER PRIZES

Sl.No.	Donor	Department	Name of Student
Doctor of Philosophy - Ph.D			
1.	Sudharshan Bhat Memorial Prize	Metallurgical Engineering	S.Ahila S.Ganesh Sundara Raman
2.	Prof AL Lasker Memorial Prize	Physics	Radha Dilip Banhatti
Master of Technology - M.Tech.			
1.	Air India Prize	Aerospace Engineering	Manoj Arora
2.	Indira Sivasailam Merit Prize	Engineering Mechanics	Ramanamurthy M.S.
3.	Prof.BVA Rao Endowment Prize	Engineering Mechanics	Ramanamurthy M.S
4.	Institute Merit Prize	Industrial Tribology	Viswanathan Chandra Sekhar Pankaj Aeri
5.	Dr.K.Subba Raju Memorial Prize	Chemical Engineering	AVU Tirupati Naidu

Sl.No.	Donor	Department	Name of Student
6.	Valli Anantharamakrishnan Merit Prize	Civil Engineering	Arathi Vanchinathan
7.	K Devarajan Memorial Prize	Civil Engg.(Transportation Engg.)	Soosan George T
8.	CMC Prize	Computer Science	Prakash S.R.
9.	Siemens India Ltd. Prize	Electrical Engineering	Kulkarni Shrish Sashikant
10.	Dr.Ing.Dieter Kind Prize	Elec.Engg.	Biju B.N.
11.	Coka Parthasarathy Memorial Prize	Industrial Management	M. Sanjeevi Reddy
12.	K.V.Arunkumar Memorial Prize	Industrial Management	M.Sanjeevi Reddy
13.	Prof B Sengupto Prize	Mechanical Engg.	Nagarajan N.C. Sridharan P.V
14.	Dr S Vaidyanathan Memorial Prize	Mechanical Engg.	Shaji Thomas
15.	Girl Brothers Prize	Mechanical Engg.	Shivshanthkumar
16.	S Anantharamakrishnan Merit Prize	Mechanical Engg.	B.Ramakrishna
17.	Mico-Bosch Prize	Mechanical Engg.	Mantosh Saha
18.	Sudarshan Bhat Memorial Prize	Metallurgical Engg.	R.Suresh Kumar
19.	American Bureau of Shipping Prize	Ocean Engineering	Suchithra N.
20.	Institute Merit Prize	Transducer Physics and Instrumentation	Birendra Singh Chauhan
Master of Science - M.Sc.,			
1.	Dr S R Ramadas 60th Birthday Commomeration Award	Chemistry	Josemon Jacob
2.	Ratna Rao Memorial Prize	Chemistry	Josemon Jacob
3.	Mrs.Mira Paul Memorial Prize	Mathematics	Sundari K.
4.	Prof.Chilukury Rama Sastry Memorial Prize	Physics	G.Venkateswara Pai
Bachelor of Technology - B.Tech.			
1.	Dr.Shanker Dayal Sharma President of India Prize	Chemical Engg.	T. Srinivasa Raghavan
2.	HAL Prize	Aerospace Engg.	Bibhuti Bhusan Patel
3.	B.Ravichandra Memorial Prize	Chemical Engg.	Anil G.
4.	Reliance Heat Transfer (P) Ltd. Prize	Chemical Engg.	Anil G.
5.	Prof C A Sastry Endowment Prize	Chemical Engg.	T.Srinivasa Raghavan
6.	Larsen & Toubro - ECC Endowment Medal	Civil Engg.	Deepak Kumar Sanghi
7.	Alumni Association Prize	Computer Science	Ravi Murthy
8.	B Ravichandran Memorial Prize	Computer Science	Ravi Murthy
9.	Philips (India) Prize	Electronics & Communication Engg.	Ranjit R.
10.	Siemens Prize	Electrical and Electronics	Anuraag Saboo
11.	Motorola Prize	Electrical and Electronics Engg.	Jayesh N.Amin
12.	Banco Foundation Prize	Mechanical Engg.	R.Sriram
13.	GVN Rayudu Memorial Prize	Mechanical Engg.	R.Sriram
14.	Sivasailam Merit Prize	Mechanical Engg.	Kopalle Vasudeva Kishore
15.	Dr.Dhandapani Prize	Metallurgical Engg.	Shuba Balasubramanian
16.	American Bureau of Shipping Prize	Naval Architecture	Ashish Kotti

4. DEPARTMENTS AND CENTRES

The Institute is having following Departments and Centres:

Departments

Aerospace Engineering
Applied Mechanics
Chemical Engineering
Chemistry
Civil Engineering
Computer Science & Engineering
Electrical Engineering
Humanities & Social Sciences
Mathematics
Mechanical Engineering
Metallurgical Engineering
Ocean Engineering
Physics

Centres

Centre for Bio-Science & Bio-Technology
Regional Sophisticated Instrumentation Centre
Computer Centre
Material Science Research Centre
Fibre Reinforced Plastics Research Centre
Central Electronics Centre
Centre for Industrial Consultancy & Sponsored Research

The activities of these Departments and Centres during the year 1994-95 as follows:

4.1. Aerospace Engineering Department

4.1.1 Introduction

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

4.1.2. Details of Faculty

Name and Qualification

Professors

T.K.Bose, Dr.Ing. (Stuttgart)

S.Krishnan, Ph.D(IIT M)
(Head upto 9th Feb.1995)

G.Subramanian, Ph.D(IIT M)

T.K.Varadan, Ph.D(IIT M)

E.G.Tulapurkara, Ph.D(IIT M)
(Head from 10th Feb.1995)

Associate Professors

S.S.Gokhale, Ph.D(Illinois)

A.Krishnan, Ph.D(IIT M)

S.Santhakumar, Ph.D(IIT M)

Assistant Professors

K.Bhaskar, Ph.D(IIT M)

R.M.S.Gowda, Ph.D(IIT M)

Job Kurian, Ph.D(IIT M)

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

M.Ramakrishna, Ph.D(Arlington)

P.Sriram, Ph.D (Georgia)

Major areas of Specialisation

Computational Fluid Dynamics, Plasma Physics, Gasdynamics, Heat Transfer and Propulsion.

Aerospace Propulsion, Solid Propellant Combustion, Solid Rocket Technology

Structural Analysis, Finite Element method, Experimental Moire and Holography

Structural Mechanics, Composites, Non-linear Structural Mechanics.

Aerodynamics, Turbulent Flows, Flight Dynamics, Wind Tunnels and Aircraft Design

Propulsion, Computational Fluid Dynamics, Simulation & Optimization, Multiphase flows
Aircraft Structural Analysis and Design, Finite Element Method and Composites
Aerodynamics, Flight Dynamics and Instrumentation

Structural Mechanics, Elasticity, Composites
Structural Mechanics, Experimental Stress Analysis, Thermal Stress Analysis
Gasdynamics, Experimental Aerodynamics, Shock tube flows and measurements
Aerodynamics, Vortex dominated flows
Aerodynamics, Numerical Methods, Computational Fluid dynamics
Structural Mechanics, Composites and Fatigue Fracture

4.1.3. Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		
	M	W	M	W	M	W	M	W	M	W	M	W	Total
Ph.D	1	-	5	-	5	-	1	-	3	-	15	-	15
M.S.	5	2	2	-	-	1	3	-	-	-	10	3	13
M.Tech.	6	1	2	-	-	-	-	-	-	-	8	1	9
B.Tech.	23	1	17	3	21	1	20	-	-	-	81	5	86
Total	35	4	26	5	26	2	24	3	-	-	114	9	123

4.1.4. Number of Scholarship holders

Programme	Institute	CSIR	Others	Total
Ph.D	7	-	2 (QIP)	9
M.S.	7	-	-	7
M.Tech.	7	-	1	8
Total	21	-	3	24

4.1.5. Number of Degrees Awarded

Programme	Number
Ph.D	2
M.Tech.	10
B.Tech.	15
Total	27

4.1.6. New Facilities added and Major Equipment procured

Departmental computer facility has been upgraded with the addition of two 486's and four 386's. The department has also been networked.

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

Sl.No.	Name of Faculty	Topic of the Lecture	Delivered at
1.	Prof.T.K.Bose	Plasma & C.F.D.	Technology University of Dresden & Ruhr Univ. Bochum, Germany
2.	Prof.G.Subramanian	(1) About ASLV D4 Launch (2) Vinveliyil Saadhanaigal (Tamil)	Doordarshan All India Radio
3.	Prof.S.Krishnan	Indiavin Vinveli Saadhanaigal (Tamil)	All India Radio

4.1.8 Visits Abroad

Name of Faculty	Country visited	Date	Purpose of visit
Prof.T.K.Bose	U.S.A.	3.6.93-15.7.94	To serve as Visiting Professor at Purdue University and to visit Germany to utilize AVH Senior fellowship

Name of Faculty	Country visited	Date	Purpose of visit
Dr.S.S.Gokhale	Germany	15.6.94-14.9.94	Under BMFT-MHRD Project
Dr.K.Bhaskar	U.S.A.	15.3.94-9.9.94	Under BOYSCAST Scheme

4.1.9 Distinguished visitors to the Department

Sl.No.	Name of the Visitor	Date of visit	Purpose of visit and Occupation
1.	Dr.Roland Pein Professor Head of Physical Chemistry Laboratory, Institute of Chemical Propulsion & Engg, DLR, Langer Ground, GERMANY	29.8.94-29.9.94	DAAD Guest Professorship Programme.
2.	Dr.H.Ruscheweyh Professor Univ.of Aachen, GERMANY	15.1.95- 19.1.95	Under North South Cooperation
3.	Dr.G.S.R. Sarma Visiting Professor Von Karman Inst. for Fluid Dynamics, Staff Scientist DLR Germany	11.8.94	Guest Lecture
4.	Dr.V.T.Nagaraj Addl. General Manager Hindustan Aeronautical Ltd. Bangalore	19.8.94	Guest Lecture
5.	Mr.K.Ibrahim Chief Manager Aircraft Design Bureau Hindustan Aeronautical Ltd. Bangalore.	13.3.95-24.3.95	Guest Lecture

4.1.10 Sponsored Projects

Title of the Project	Period	Funding Agency	Amount (Rs.In lakhs)	Co-ordinators
Preliminary Design Study of Hypersonic Airbreathing flying Test Bed	One year	ISRO	3.800	All Faculty of Aero.Engg.
Flow Around 3-D Bluff bodies with relevance to Building Aerodynamics	Three years	DST	8.000	Dr.EG.Tulapurkara Dr.B.H.L.Gowda (Applied Mech)
Studies on Low Speed Turbulent Flows in Complex Enclosures	Three years	Volks-Wagen Foundation	20.000	Dr.EG.Tulapurkara Dr.T.K.Bose
Evaluation of models of turbulence using DNS Data base	1 year & 6 months	CSIR	1.860	Dr.EG Tulapurkara
Computation of Supersonic turbulent base flow	Four years	ISRO	4.900	Dr.EG. Tulapurkara
Symbolic Computation as an Aid for Structural Analysis	One year	IRDF	0.500	Dr.K.Bhaskar
Erosive Burning Studies of Solid Propellants under transonic and supersonic cross flow Mach numbers	Three years	ARDB	5.980	Dr.S.Krishnan

Title of the Project	Period	Funding Agency	Amount (Rs.in lakhs)	Co-ordinators
Development of Solid Fuel and Combustion chamber system for Hybrid Rocket Motor	Three years	ISRO IIT(M)	5.700	Dr.S.Krishnan
Burning Rate Prediction in AP/HTPB Propellants with Burning Rate Modifiers	Three years	-do-	4.290	Dr.S.Krishnan
Computer Aided Design of Aerodynamically Heated Structure	Three years	ARDB	11.850	Dr.TK Bose Dr.R Palaninathan (App. Mech)
Nozzle Flow with Secondary Injection Phase - II	Two years	ISRO	5.000	Dr.TK. Bose
Computation of performance of Cryogenic Rockets using detailed chemical reactions	Three years	ISRO	9.960	Dr.TK. Bose Dr.SS. Gokhale
Vibration Relaxation Effects in Gasdynamics	Two years	ISRO	3.900	Dr.TK. Bose
A Higher order theory of laminated composite shells under transverse loads	Four years	ARDB	3.210	Dr.TK. Varadan
Thermal stress analysis of laminated composites with specific reference to aerospace applications	Three years	ARDB	5.005	Dr.TK. Varadan Dr.K. Bhaskar
Theoretical Studies in Composite Airbreathing Propulsion	Two years	ISRO	4.950	Dr.SS. Gokhale
Study of Flow through Axisymmetric/Two Dimensional Variable area Convergent-Divergent Nozzle	Two years	ADA	6.025	Dr.M.Ramakrishna
Analysis of Flow through an Augmented Rocket	Three years	ISRO- IIT(M)	4.400	Dr.M.Ramakrishna
Development and Calibration preliminary experiments on a Hypersonic shock tunnel	Three years	ARDB	6.450	Dr. Job Kurian
Studies on shock wave Propagation in Gas particle mixtures	Three years	DAE	6.100	Dr.Job Kurian
Ignition studies on Solid Propellants	-do-	ISRO	4,700	Dr.Job Kurian Dr. K.A. Bhaskaran
Studies on Advanced Propulsion for Aerospace Vehicles	Four years	DRDL	19.980	Dr.Job Kurian Dr.V. Sriramulu (Mech. Engg.)
Testing of Ramjet Combustors	One year	ISRO	1.550	Dr.Job Kurian
Studies of plume flows and plume impingement	Two years	ISRO	5.966	Dr.Job Kurian
Development of Self-correcting wind-tunnel technology	Three years	ARDB	6.650	Dr.S.Santhakumar
Duct Losses in Oscillatory flow (Wave Energy Group)	Six months	DOD	1.460	Dr.S.Santhakumar

Title of the Project	Period	Funding Agency	Amount (Rs.in lakhs)	Co-ordinators
Study of Flow through Axisymmetric/Two Dimensional variable area Convergent/Divergent Nozzles	Two years	ADA	6.225	Dr.M.Ramakrishna

4.1.11 Major Consultancy Assignments

Title	Organisation	Amount (Rs.in lakhs)	Co-ordinator
Analysis of Gas Generator in the Missile Canister	DRDL	1.200	Dr.S.Krishnan
Studies on Nozzle flow Separation	LPSC	1.000	Dr.SS. Gokhale
Model Testing of ALH Helicopter with EFG	HAL	19.500	Dr.S.Santhakumar Mr.S.Sambandan (OEC)
Aerodynamic and Structural performance of Airfoil and Mounting	BCEL (Joint Project)	6.000	Dr.E.G.Tulapurkara Dr.A.Krishnan Dr.TK. Varadan Dr.G.Subramanian Dr.S.Santhakumar Dr.M.Ramakrishna Mr.S.C.Rajan

4.1.12 Research Publications

1. G.Subramanian and Char. Raghunandan, "On Improving the Fatigue Life of U-Form Bellows", *Jl.Math. Processing Tech.* 41, 105-114, 1994.
2. G.Subramanian, VVS Raveendra and M.Gopalakrishna Kamath, "Robust Boundary Triangulation and Delannay Triangulation of Arbitrary Planar Domains" *Intl. Jl.Num. Meth. Engg.*, 37, 1779-1789, 1994.
3. VVS Raveendra and G.Subramanian, "A priori Estimation of Triangles in an Arbitrary Planner Triangulation", *Comp. Str.* 52(2), 215-218 1994.
4. M.Ganapathi, T.K.Varadan & J.Jijew, "Field-consistent element applied to flutter analysis of circular cylindrical shells" *Jl. of Sound & Vibration*, 171(4), 509-527, 1994.
5. M.Ganapathi, T.K.Varadan & V.Balamurugan, "Dynamic instability of laminated composite curved panels using finite element method", *Computers & Structures*, Vol.53, No.2, pp 335-342, 1994.
6. T.K.Varadan, Y.Sridhar and A.V.Krishna Murthy, "Free edge interlaminar stresses in symmetric cross-ply laminates under transverse loads", *Jl. of Ae.S.I.*, Vol.46, No.4, 1994, pp.173-185.
7. K.Bhaskar & T.K.Varadan, "Bench Mark elasticity solution for locally loaded laminated orthotropic cylindrical shells", *AIAA Jl.* Vol.32, No.3, 1994, pp.627-632.
8. Chacko.B, Balabaskaran. V, Tulapurkara.,E.G. and Radhkrishna.H.C. "Performance of S-cambered profile with cut-off trailing edges", *Trans ASME Jl. of Fluids Engg.*, Vol.116, pp.522-527, Sep.1994.

9. Madhusudan.R.S., Aswathanarayana.P.A., Balabaskaran.V., and Tulapurkara.E.G. "Boundary layer studies over an S-blade" Fluid Dynamics Ressearch, Vol.14, pp.241-258, 1994.
10. Tulapurkara.E.G., Lakshmana Gowda.B.H., and Swain.S.K. "Reverse flow in Channels-effect of front and rear obstructions", Physics of Fluids, Vol.6, pp.3847-3853, Dec.1994.
11. Tulapurkara.E.G., Ramjee.V., and Jacob George, "Development of a bluff body wake under the combined influence of curvature and pressure gradient", Experiments in Fluids, Vol.18, pp.311-318, 1995
12. B.Viswanathan and A.Krishnan, "Free Vibration studies on Right Triangular lamina" Jl. of Sound & Vibration, 170(5), pp 690-696, 1994.
13. Channa Raju, Sreekanth A.K, Job Kurian, "Impact Pressure Measurements in high speed Rarefied flow", Vol.21, No.2, pp.131-138, 1994.
14. Raju. C and Kurian J, "Experimental investigation of Rarefied flow through rectangular slits and nozzles", Experiments in Fluids, 17, 4 pp.220-224, 1994.
15. Rajamanohar, Damodaran,K.A. & Job Kurian "Experimental studies on supersonic mixer ejector", Expts. in Fluids, 17, No.5, pp.220- 224, 1994.
16. K.Rangachari, SC Rajan and A.Krishnan, "A Semi Analytic Method for evolution of closed Vortex sheets - Mechanics Research Communications, Vol.4, pp 397-404, 1994
17. SC Rajan, "Unification of Ideal fluid and Rigid body kinematics using vorticity, Vol.21, pp 443-448, 1994

Conference

1. G.Subramanian and A.Raman, "Isospectral Systems for plates", Aerodynamic Testing and Structural Dynamics, Intensive Publishing Pvt. Ltd., Bangalore, 157-171, 1994

Proceedings of National Conferences

1. Lakshmana Gowda.B.H., Kannababu.A. and Tulapurkara.E.G. "Interference effects on the pressure distribution on a low-rise body due to a high-rise body in tandem", Aerodynamic Testing and Structural Dynamics, Bangalore, Oct.21-22, 1994, pp.23-30.
2. Tulapurkara.E.G., Ramjee.V. and George.J. "Effect of varying curvatures on a wake developing in an adverse pressure gradient", Proc.21st Nat. Conf. on Fluid Mech. and Fluid Power, Hyderabad, Dec.27-29, 1994, pp.FD 3.1-3.6.
3. Visvanatha Sastry.T.L., Balabaskaran.V., and Tulapurkara.E.G., "Analysis of flow over S-blade profiles using integral method", Proc.21st Nat. Conf. on Fluid Mech. and Fluid Power, Hyderabad, Dec.27-29, 1994, pp.FM3.1-3.6.

Proceedings of International Conferences

1. Tulapurkara,E.G., Ramjee.V., and George.J., "Development of wake in presence of both curvature and pressure gradient", Proc.Symp. on boundary layers and free shear layer, ASME Fluid Engg. Division. Vol.184, pp.195-202, 1994.
2. Gowda.B.H.L., Tulapurkara.E.G., and Swain.S.K., "Reverse flow in Channels-influence of splitter plates", Fourth Triennial Inter- national Symposium on Fluid Control, Measurement and Visualiation (FLUCOME'94), TOULOUSE, 29th Aug-1st Sep. 1994, pp.571-576.

4.1.13 Any other relevant details

The Department has 14 faculty members, 12 non-teaching technical and 11 non-teaching and non-technical staff.

4.2. Applied Mechanics Department

4.2.1 Introduction

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

The research in the Biomedical Engineering Division is concentrated in the three main areas of Bioinstrumentation, Biomechanics and Biomedical Image and Signal processing. The faculty of this Division are carrying out research in collaboration with hospitals and medical research institutes, in the areas of Biomechanics of Leprotic hand and foot, Rehabilitation aids, Finite element method and Image processing applications in Biomechanics, Macro-micro-hemodynamics, and in Laser and Artificial Neural Networks applications in medical diagnosis.

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

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

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

4.2.2 Details of Faculty

Name and Qualification

Professors

Aswatha Narayana, P.A. Ph.D(IIT Madras)

Chandrasekara Swamy, N.V. Ph.D(IISc)

Ganesan, N. Ph.D(IIT Madras)

Lakshmana Gowda, B.H. Ph.D(IIT Madras)

Megha Singh, Ph.D(Carolina)

Narayanan, S. Ph.D(IIT Kanpur)

Palaninathan, R. Ph.D(IIT Madras)

Patil, K.M. D.Sc. (Washington
[Head until Nov. 1994]

Major area of Specialisation

Fluid Mechanics, CED with heat transfer and non-conventional energy resources

Fluid Mechanics

Vibration, Stress Analysis, Tribology, Acoustics and Noise control

Fluid Mechanics

Lasers and ultrasound in medicine, Biofluid mechanics, Biomedical Instrumentation

Vibration, Random Vibration, Chaos & Nonlinear Dynamical Systems, Acoustics and Noise Control

Structural Mechanics, Composite Structures, Metal Matrix Composites

Biomechanics, Rehabilitation Engineering

Name and Qualification

Raamachandran, J. Ph.D(IIT Madras)

Ramamurti, V. Ph.D(IIT Madras)

Ramjee, V. Ph.D(IISc)

Srinivasa Prabhu, B. Ph.D(IIT Madras)
[Head since Dec. 1994]

Srinivasan, P.S. Dr. Es.Sc. (Poitiers)

Associate Professors

Balakrishnan, M. Ph.D(IIT Madras)

Radhakrishnan, S. Ph.D(IIT Madras)

Assistant Professors

Krishna Iyer, P. Ph.D(IIT Madras)

Lakshminarasimhan, J. Ph.D(IIT Madras)

Lakshmana Rao, C. D.Sc(MITUSA)

Ramasubba Reddy, M. Ph.D(IISc)

Sujatha, C. Ph.D(IIT Madras)

Swamamani, S. Ph.D(IIT Madras)

Senior Scientific Officer Gr.II

Thomas, G. M.Sc. (Madras)

Technical Officer

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

Visiting Faculty

Rama B. Bhat

Sivakumar, M.S.

Major area of Specialisation

Solid Mechanics, Experimental Stress Analysis,
Composite Structures, Bio-mechanic

Machine Dynamics, Vibration, Stress Analysis,
Rotor Dynamics, Computer Aided Design

Fluid Mechanics, Turbulence

Rotor Dynamics, Tribology, Maintenance
Engineering

Fluid Mechanics

Fluid Mechanics/Low speed Aerodynamics
Biomechanics, Rehabilitation Engineering

Solid Mechanics, Stress Analysis, Elasticity and
Plasticity

Fluid Mechanics: Incompressible Aerodynamics,
Internal flows

Fracture Mechanics, Micro Mechanical Modelling of
Materials, Bio Materials,

Neural network applications in medicine,
Biomedical Instrumentation, Medical Imaging &
Signal Processing

Machine Dynamics, Acoustics,
Instrumentation, Condition Monitoring, Fibre
Optics, Vehicular Vibration

Instrumentation, Machine Dynamics, Tribology,
Medical Ultrasonics, Acoustics, Biomedical
Instrumentation

Experimental Stress Analysis

Engineering Mechanics, Stress Analysis, Design of
Machine Elements.

Vibrations and Rotor Dynamics

Plasticity, Solid Mechanics

4.2.3 Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D	6	1	6	-	9	1	7	1	8	-	36	3	39
M.S.	9	1	7	1	5	-	-	-	1	-	22	2	24
M.Tech	10	1	13	-	-	-	-	-	-	-	23	1	24
Total	25	3	26	1	14	1	7	1	9	-	81	6	87

4.2.4 Number of Scholarship/Fellowship holders

Programme	Institute	Others	Total
Ph.D	19	3 [QIP]	22
M.S.	20	-	20
M.Tech	15	1 [QIP]	16
Total	55	2	57

4.2.5 Number of Degrees Awarded

Programme	Number Awarded
Ph.D	8
M.S.	6
M.Tech	13
Total	27

4.2.6 New Facilities Added and Major Equipment procured

1. Modal Analysis System
2. Stress Wave Analyser
3. Modal Shakers

4.2.7 Short-Term Courses/Workshops/Seminars/Symposia/Conferences organised

S.No.	Co-ordinator(s)	Title of Course/Workshop/Seminar/Symposia/Conference	Period
1.	Dr. A.Paramasivam Dr. Meher Prasad Dr. S.Swarnamani Dr. V.G.Idichandy	Vibration Testing Facilities	27-28 Mar. 95
2.	Dr. A.Ramachandriah Dr. S.Swarnamani	Industrial Noise and Vibration Control	27-28 Nov. 94

4.2.8 Short-Term Courses/Workshops/Seminars/Symposia/Conferences/Training attended by the Faculty in recognized Academic Institutions and Public Sectors

S.No.	Name of Faculty	Title	Period/Duration
01.	Dr. P.A. Aswatha Narayana	21st Conference on Fluid Mechanics & Fluid Power	Dec 22-24 1994
02.	Dr. M.Balakrishnan	Discussion meeting on Aerodynamic testing & structural dynamics, IISc. Bangalore	Oct 21-22 1994
03.	Dr. Megha Singh	International Workshop on short term experiments under microgravity, Bremen, Germany	July 4-7 1994
04.	Dr. Megha Singh	30th COSPAR meeting Hamburg, Germany	July 11-21 1994
05.	Dr. Megha Singh	3rd International Symposium on Biofluid Mechanics, Munich, Germany	July 16-19 1994
06.	Dr. Megha Singh	15th Ann. Conf. of Indian Asso. Biomed. Scientists, Ootacamund, India	Oct 8-9 1994
07.	Dr. S. Narayanan	National Seminar on Aero Structures-94 [NASAS-94] I.I.T. Kharagpur	Dec 8-9 1994

S.No.	Name of Faculty	Title	Period/Duration
08.	Dr. S. Narayanan	National Symposium on Acoustics NSA-94 IGCAR, Kalpakkam and Workshop on Acoustics for Machinery Diagnostics and Condition Monitoring.	Dec 14-16 1994
09.	Dr. S. Narayanan	DST and CII Sponsored course on Quieter Technology	CMT and I, Bangalore
10.	Dr. R. Palaninathan	National Symposium on Developments in Advanced Composites & Structures	Sept 17 1994
11.	Dr. K.M. Patil	First Regional Conf. IIT Delhi of IEEE EMBS	Feb 15-18 1995
12.	Dr. M. Ramasubba Reddy	First Regional Conf. IIT Delhi of IEEE EMBS	Feb 15-18 1995

4.2.9 Special Lecture(s) Delivered

S.No.	Name of Faculty	Topic of Lecture	Delivered at	Date
01.	Dr.C.Lakshmana Rao	Micromechanisms of Fracture	BARC Bombay	Feb 1995
02.		Dynamic Fracture Mechanics	BARC Bombay	Feb 1995
03.	Dr.S.Narayanan	Fundamentals of Machinery Acoustics	IGCAR Kalpakkam	Dec.14 1994
04.		Vibration Control	IIT Madras	27-28 Nov.1994
05.		Vibration Control	Pondicherry Engg. College	10 Feb 1995
06.	Dr.B.Ram Bhat	Computer Aided Design & Finite Element Analysis using Microcomputers	Manipal Inst. of Tech. Karnataka	1-5 Aug 1994
07.		Micromechatronic Systems and Applications	Institution of Engineers (India) Mangalore	5 Aug 1994
08.		Fundamentals of Vibration	IIT Madras	27-28 Nov. 1994
09.		Micromachined Sensors for Condition Monitoring	IIFE Intl. Convention Madras	8-10 Dec 1994
10.		Micromechatronic Devices and applications	Osmania Univ. Hyderabad	6 Jan 1995
11.		Aerospace applications of Micromechatronic Systems	Aeronautical Soc. of India Madras	8 Feb 1995
12.		Fundamentals of Vibration	Pondicherry Engg. College	10 Feb 1995
13.		Introduction to Micromechatronics	Assoc. for Machines & Mech. Bangalore	24-25 Feb 1995
14.	Dr.M.Ramasubba Reddy	Biomedical signals acquisition and processing	College of Engg. Anantapur	May 18 1994

S.No.	Name of Faculty	Topic of Lecture	Delivered at	Date
15.		Medical imaging:Nuclear magnetic resonance imaging	"	May 19 1994

4.2.10 Visits Abroad

S.No.	Name of Faculty	Country visited	Date	Purpose of visit
01.	Dr.Megha Singh	Germany	1-06-94 to 20-7-94	Research
02.	Dr.S.Narayanan	England	5-9-94 to 8-9-94	To present paper & participate in the IUTAM Symp. on Active Vibration control of Struc.
03.	Dr.K.M.Patil	The Netherlands [Eindhoven]	25-6-94 to 09-7-94	On collaborative project
04.	Dr.K.M. Patil	The Netherlands [Amsterdam]	10-7-94 to 15-7-94	To present three papers in the 2nd World Congress of Biomechanics
05.	Dr.B.S.Prabhu	The Netherlands	13-6-94 to 16-6-94	Attended 39th ASME Int. Gas Turbine & Aeroengine Cong. and Exposition
06.	Dr.S.Radhakrishnan	The Netherlands [Amsterdam]	10-7-94 to 15-7-94	To present paper at the 2nd World Congress of Biomechanics

4.2.11 Distinguished Visitors to the Department (Important dignitaries above the level of Professors)

S.No.	Name of the Visitor and Occupation	Date of visit	Purpose (Lecture/Discussion)
1.	Dr. R. Seshadri Faculty of Engg. & App. Science Memorial Univer. of Newfoundland St. John's Newfoundland Canada	Nov.26-Dec.4 1994	Lecture-cum-visit

4.2.12 Sponsored projects

S.No.	Title	Period	Funding Agency	Amount (In lakhs)	Co-ordinator(s)
01.	Development of foot model & foot pressure monitoring system .. leprosy patients	4 years	DST Eindhoven Univ. of Tech.Eindhoven, The Netherlands	23.40	Dr.K.M.Patil, Dr.P.K.Oommen, (CLTRI Chengalpattu) Dr.G.N.Malaviya(CJIL Agra)Prof.A.Huson (Limburg Univ.The Netherlands) Dr.L.H.Braak (Eindhoven Univ.The Netherlands)

S.No.	Title	Period	Funding Agency	Amount (In lakhs)	Co-ordinator(s)
02.	Micro-controller based communicator kit for spastic children	1.1/2 years	IRDF	-	Dr.M. Ramasubba Reddy Dr. S.Radhakrishnan, Dr. Ranjana Shukla
03.	Niharika Ishan - A new type of wind turbine	1.1/2 years	DNES	2.00	Dr.N.V.C.Swamy, Dr.P.A.Asawatha Narayana
04.	3-D conduction code temperature distribution using FEM for GT blades	3 years	ARDB	6.75	Dr.K.N.Seetharamu, Dr.P.A.Asawatha Narayana
05.	Development of a software for spacecraft technical analysis using finite element methods	3 years	ISRO	4.92	Dr.K.N.Seetharamu, Dr.T.Sundararajan, Dr.P.A.Asawatha Narayana
06.	Study of instability of liquid sheets from swirl pray nozzles	3 years	ISRO	5.50	Dr. M. Balakrishnan
07.	Active vibration control of flexible structures	-	ARDB	4.9	Dr.S.Narayanan
08.	Augmentation of vortex formation during discharge of liquids from container due to disturbances induced on the liquid	3 years	ICSR-ISRO	2.88	Dr.B.H.L.Gowda, Dr.S.Swarnamani
09.	Dynamic test facility	2 years	NIOT	35.00	Dr.S.Narayanan, Dr.Meher Prasad, Dr.S.Swarnamani
10.	Design and Development of micromachined silicon accelerometers	2 years	DRDO	24.75	Dr.K.N.Bhat, Dr.P.R.S.Rao, Dr.B.Rama Bhat, Dr.B.S.Prabhu, Dr.S.Swarnamani
11.	Development of micromachined silicon sensors for mechanical and Biomedical applications	2 years	TAPTEC	20.00	Dr.B.Rama Bhat, B.S.Prabhu, Dr.S.Narayanan, Dr.S.Swarnamani, Dr.C.Sujatha

4.2.13 Major Consultancy Assignments

S.No.	Title	Organisation	Amount (Rs.In Lakhs)	Co-ordinator(s)
01.	Development of code of heat transfer	DRDO	0.05	Dr.K.N.Seetharamu, Dr.T.Sundararajan, Dr. P.A.Aswatha Narayana
02.	Development of code for flow and heat transfer	DRDO	0.75	Dr.K.N.Seetharamu, Dr. T.Sundararajan, Dr. P.A.Aswatha Narayana
03.	Aerodynamic force and moment measurements on missile nose cap	DRDL	0.25	Dr. M.Balakrishnan
04.	Analysing the vibration problem in pump P 1902B	Tamilnadu Petroproducts Ltd. Madras 68	0.15	Dr.V.Ramamurti, Dr.S.Swarnamani
05.	Calibration of vibration analyser B and K 2515	"	0.05	Dr.V.Ramamurti, Dr.S.Swarnamani
06.	Calibration of vibration sound level meter	Esquire Engineers & Consultants Ltd. Madras-18	0.025	Dr.V.Ramamurti, Dr.C.Sujatha
07.	Seismic Test on 420 KV Isolater	S&S Power Switchgear Ltd. Madras 116	0.25	Dr.S.Narayanan, Dr.N.Ganesan, Dr.S.Swarnamani
08.	Seismic Test I on 245 KV and 145 KV Isolators	G.R. Power Switchgear Pvt. Ltd. Hyderabad	0.23	Dr.S.Swarnamani Dr. B.S. Prbhu Dr. N.Ganesan
09.	Seismic Test II on 245 KV and 145 KV Isolators	"	0.23	Dr.S.Narayanan, Dr.V.Ramamurti, Dr.S.Swarnamani Dr. C.Sujatha
10.	Vibration testing of Locohead mounted vacuum circuit breaker	GEC Alsthom India Allahabad	0.25	Dr.V.Ramamurti, Dr.B.S.Prabhu, Dr.C.Sujatha
11.	Seismic withstandte st on 245 KV current transformer (CT)	Transformers and Electricals Kerala Ltd. Angamally, Kerala	0.18	Dr.S.Narayanan, Dr.B.S.Prabhu, Dr.C.Sujatha
12.	Frequency testing of damper assembly - torsional	Autolec Mfg. & Mktg. Co. (P) Ltd. Madras 58	0.015	Dr.S.Swarnamani
13.	Dynamic experimental stress analysis of auto chassis	Greaves Ltd. Baramati-413102	0.65	Dr.V.Ramamurti Dr.S.Swarnamani

S.No.	Title	Organisation	Amount (Rs.in Lakhs)	Co-ordinator(s)
14.	Monitoring of graphlatene cement plant lubricant	Anand Engineers (P) Ltd. Bombay	0.30	Dr.B.S.Prabhu
15.	Stress analysis of turbine blades	Nuclear Power Corp.Bombay	0.40	Dr.V.Ramamurti
16.	Mechanical operation test vacuum circuit breaker	S&S Power Switchgear Ltd. Madras	0.12	Dr.S.Narayanan Dr.N.Ganesan Dr.S.Swarnamani
17.	Natural frequencies of turbine blades MTPS Kalpakkam	Nuclear Power Corp. Bombay 94	0.20	Dr. V. Ramamurthi Dr. Swarnamani
18.	Seismic test of circuit breakers	Crompton Greaves Ltd. Nasik	0.54	Dr.S.Narayanan Dr.N.Ganesan Dr.S.Swarnamani Dr.C.Sujatha
19.	Analytical dynamic stress determination of auto chassis	Greaves Ltd. Baramati, Pune	0.50	Dr.V.Ramamurti
20.	Testing of torsional vibration dampers for natural frequency and damping characteristics	Autolect Mfg. & Mktg. Co. (P) Ltd. Madras 50	0.015	Dr.S.Swarnamani
21.	Notice Control study of the generator set	Tata Consultancy Services Madras 86	0.15	Dr.S.Narayanan Dr.S.Swarnamani
22.	Noise reduction of spin test rig	Lucas-TVS Padi Madras	0.05	Dr.S.Narayanan Dr.S.Swarnamani
23.	Natural frequency determination of axial fan impellers	Indl. Systems & Equipments (P) Id. Madras	0.05	Dr.V.Ramamurti Dr.S.Swarnamani
24.	Checking finite element anlysis	Micro CAD Systems Madras 86	0.12	Dr.V.Ramamurti
25.	Noise measurement of axial fans	H.J.J.Engineers Bangalore	0.15	Dr.S.Narayanan Dr.S.Swarnamani Dr.C.Sujatha
26.	Noise level comparison of timing belts	Fenner (India) Ltd. Madras 14	0.08	Dr.S.Narayanan Dr.S.Swarnamani
27.	Computer programme for bearing coefficient	BHEL Bhopal	0.70	Dr.B.S.Prabhu
28.	Validation of engine damper for AL-Hino W04D upspeeded engine	Ashok Leyland Ltd. Madras 57	0.32	Dr.B.S.Prabhu Dr.S.Swarnamani

S.No.	Title	Organisation	Amount (Rs.in Lakhs)	Co-ordinator(s)
29.	Seismic testing on CTS	BHEL Jhansi	0.42	Dr.S.Swarnamani Dr.S.Narayanan Dr.N.Ganesan
30.	Vibration problem of the conveyor system drive unit	Krupp Industries (I) Ltd. Pune 18	0.15	Dr.V.Ramamurti
31.	Seismic withstand test on 245 KV HCB Isolator tries	Hivelm Industries Madras 32	0.20	Dr.V.Ramamurti Dr.S.Swarnamani Dr.C.Sujatha
32.	Investigation of calendering synthetic bowl	ITC Ltd. Madras 19	0.15	Dr.V.Ramamurti Dr.S.Swarnamani
33.	Vibration testing of locohead mounted vacuum circuit breaker	GEC Alsthom Allahabad	0.30	Dr.V.Ramamurti Dr.B.S.Prabhu Dr.C.Sujatha
34.	Noise studies in Hotel Chola Sheraton	Hotel Chola Sheraton Madras	0.05	Dr.S.Narayanan Dr.S.Swarnamani
35.	Determination of natural frequency and damping of torsional damper	Autolect Mfg. & Mktg.Co. (P) Ltd. Madras 58	0.015	Dr.S.Swarnamani
36.	Natural frequencies of axial fan impellers	Industrial Systems Equipments (P) Ltd. Madras 20	0.30	Dr.V.Ramamurti Dr.C.Sujatha
37.	Technical assessment and advice on the turbo generator	EIDParry (I)Ltd Nellikuppam 607 105	0.05	Dr.B.S.Prabhu
38.	Seismic test of 198 KV zine oxide lightning arrester	Elpro International Ltd. Pune 411 033	0.15	Dr.B.S.Prabhu Dr.S.Swarnamani Dr.N.Ganesan
39.	Seismic test of 145 KV circuit breaker	Crompton Greaves Ltd. Nasik	0.23	Dr.S.Swarnamani Dr.S.Narayanan

4.2.14 Honours and Awards

S.No.	Name of Faculty	Honours/Awards	Purpose
1.	Dr.P.A.Aswatha Narayana	Dr. M.G. Despande Memorial Prize	Best paper in FMFP Conf.
2.	Dr. Megha Singh	Member	World Council of Biomechanics
3.	Dr. Megha Singh	Member	Intl. Steering Committee, 2nd World Cong. of Biomechanics, The Netherlands
4.	Dr. Megha Singh	Editor	Clinical Hemorheology - an International Journal

S.No.	Name of Faculty	Honours/Awards	Purpose
5.	Dr. S. Swarnamani Dr.USP Shet K.Ramnadh Dr.BVA Rao	Sir C.V. Raman Award	Best paper in J.Acou. Soc. India for the year 1992
6.	Dr. S. Swarnamani Dr.D.Arunachalam Dr.CS Prasad	Dr. T.N. Chawla Award	Best paper presentation/Dissertation, Nat. Conf. Indian Society of Peridontology, Hyderabad

4.2.15 Books/Monographs Published

S.No.	Name of Faculty	Title	Publisher
01.	Dr.N.C.Nigam Dr.S.Narayanan	Applications of Random Vibrations	Narosa India - Addison Wesley Singapore, Springer Verlag, Germany

4.2.16 Research Publications

01. P.S. Bangarashetti and C. Lakshmana Rao, Constitutive modelling of bamboo fibers, National Symposium on Structural Mechanics, IISc., Bangalore, 1994.
02. J.K. Chakraborty and K.M. Patil, A new modular six-bar linkage trans-femoral prosthesis for walking and squatting, Prosthetic & Orthotics International, England, Vol. 18, 98-108, 1994.
03. P.J. Joshy, B.H. Lakshmana Gowda and S. Swarnamani, Influence of discharge of liquid from a cylindrical container, Proc. 21st Natl. Conf. Fluid Mechanics and Fluid power, Dec.27-29, 1994, HF 1.1 - 1.4.
04. P. Kamath, K. Gopinath and S. Swarnamani, Wear monitoring in rolling contact fatigue testing of bearing steel, XI-NCIT, Jan.22-25, 1995, 427-432.
05. Kartik Venkatraman and S. Narayanan, A neural network static shape controller, Proc. NASAS-94, IIT Kharaghpur, "Computational Structural Mechanics", Ed. P.K.Sinha and S.Parthan, Allied Publishers, 563-571, 1994.
06. P.K. Koola, M. Ravindran and P.A. Aswatha Narayana, Studies on the relative performance of the oscillating water column wave energy devices, ASME J. of Energy Resources Tech. Oct. 1994.
07. Y.T.Krishne Gowda, P.Nithiarasu, T.Sundararajan, K.N.Seetha-ramu and P.A.Aswatha Narayana, Mesh generation using delaunay triangle, Proc. II Annual Conf. on Indian Soc. Industrial and Applied Mathematics, Madras, Feb 23-25, 4-1 to 4-9, 1994.
08. B.V. Krishna Satya Sai, K.N. Seetharamu and P.A. Aswatha Narayana, Solution of transient laminar natural convection in a square cavity by an explicit finite element scheme, Numerical Heat Transfer, Part A, 25(2) 1, 593-609, 1994.
09. S. Kumaresan, S. Radhakrishnan and N. Ganesan, Mixed models in finite element analysis, JI. of Computers & Structures, Vol. 51, No. 1, 117-123, 1994.
10. S. Kumaresan, S. Radhakrishnan and N. Ganesan, 3-D finite element analysis of human head subjected to impact, Proc. of the 2nd World Cong. of Biomechanics, July 10-15, Amsterdam, The Netherlands, Vol. I, 237, 1994.
11. R.S.Madhusudan, V. Balabaskaran, E.G. Tulapurkara and P.A. Aswatha Narayana, Boundary layer studies over S-blades, Fluid Dynamics Research, 14, 241-258, 1994.

12. G.C. Mohankumar, J. Raamachandran and S. Radhakrishnan, Stress distribution pattern of a single rooted tooth, IX Annual Conf. of Federation of Operative Dentistry, Calcutta, Dec. 1994.
13. H.C. Nagaraj, S. Radhakrishnan, S. Srinivasan and T.R. Swaminathan, A Real-time recording system for BAER and the study of stimulus polarity effects, Proc. of the 1st Regional Conf. of IEEE Engg. in Medicine & Biology Society, IIT, Delhi, Feb 15-18, 3.31-3.32, 1995.
14. S. Narayanan and P. Sekar, Periodic and chaotic motions of a sequence prism in cross flows, J. Sound and Vibration 170(1), 1- 24, 1994.
15. R. Palaninathan and C. Lakshmana Rao, Layered cylindrical shells under hyperthermal loading, Nat. Sym. on Developments in Advanced Composites and Structures, DRDL, Hyderabad, Sep. 17, 1994.
16. K.M. Patil, M. Babu, P.K. Oommen and G.N. Malaviya, A new on-line system for analysis of dynamic foot pressure in leprosy, Proc. of the 2nd World Conf. of Biomechanics, Amsterdam, The Netherlands, Vol. II, 389a, 1994.
17. K.M. Patil M. Babu, P.K. Oommen, G.N. Malaviya, A. Huson and L.H. Braak, On-line system for measurement and analysis of standing and walking foot pressures in normals and leprosy patients, Proc. of the First Regional Conf. of IEEE Engg. in Medicine and Biology Society, IIT, Delhi, Feb 15-18, 4.109-4.110, 1995.
18. B.S.V.P. Patnaik, P.A. Aswatha Narayana and K.N. Seetharamu, Finite element simulation of flow past a cylinder with integral wake splitter, 29th Indian Society of Theoretical & Applied Mechanics Conf., Vishakapatnam, MF 15, Dec. 1994.
19. B.S.V.P. Patnaik, P.A. Aswatha Narayana and K.N. Seetharamu, Numerical simulation of vortex shedding behind bluff bodies, 21st Nat. Conf. on Fluid Mechanics & Fluid Power, Hyderabad, CF 2.1 to CF 2.6, 1994.
20. B.S. Prabhu, P. Arumugam, S. Swarnamani, Vibration Monitoring - Recent developments in Shaft Crack Detection, Proc. Int. Convention of Plant Engineers, TEPEM-94, Madras, Dec.8-10, 303-314, 1994.
21. B.S. Prabhu, P. Arumugam and S. Swarnamani, Dynamic analysis of a General Rotor considering Transverse Crack and Misalignment in the Coupling, Proc. Natl. Conf. on Airbreathing Engines and Aerospace Propulsion, Trivandrum, Dec. 15-17, 726-735, 1994.
22. B.S. Prabhu, P. Arumugam and S. Swarnamani, Experimental identification of linearised oil film coefficients of cylindrical and tilting pad bearings, 38th ASME, Int. Gas Turbine and Aeroengine Congress and Exposition, The Hague, The Netherlands, June 13-16, 1994 (94-GT-81).
23. B.S. Prabhu and A.S. Sekhar, Stress fluctuation and vibration in cracked shafts, J.Sound & Vib. , 169, 5, 655-667, 1994.
24. B.S. Prabhu and A.S. Sekhar, Transient analysis of a cracked rotor passing through a critical speed, J. Sound & Vibration, 173, 3, 415-421, 1994.
25. B.S. Prabhu and A.S. Sekhar, Unbalance response of rotor considering the distributed bearing stiffness and damping, 39th ASME, Int. Gas Turbine & Aero Engine Cong. & Exposition, The The Hague, The Netherlands, June 13-16, 1994 (94-GT-128).
26. B.S. Prabhu and A.S. Sekhar, Severity estimating cracked shaft vibration within fluid film bearings, STLE Annual Meeting, May 1-5, Pittsburg, 1994.
27. B.S. Prabhu and D. Sheeja, Thermohydrodynamic analysis of journal bearings lubricated by non-Newtonian fluids - Theory and Experiments, I Mech.E. J.Engg. Tribology, Vol.208, 173-181, 1994.
28. B. Prakash and M. Singh, Similarity of blood flow pattern in invivo and invitro microvessels by axial tomographic and image velocimetry techniques In:Biomedical Engg-Recent Developments. J.Vossoghi (ed) Univ. Dist. Col, Washington, 1007-1010, 1994.

29. B. Prakash and M. Singh, Optimum energy utilization to maintain blood flow in glass capillaries: An analysis based on flow field determination, 2nd World Cong. Biomech., Amsterdam, The Netherlands, July 10-15, 33, 1994.
30. J. Raamachandran and G.C. Mohan Kumar, Measurement of principal stresses using absolute retardation in photo-elasticity using image processing, XXI Symposium on Optics, IIT, Madras, Feb 10- 12, 1994.
31. J. Raamachandran and G.C. Mohan Kumar, Measurement of principal stresses in photoelasticity using digital image processing method, Intl. Conf. on Advances in Engineering Measurements, Univ. of Edinburgh, Aug.-Sept. 1994.
32. J. Raamachandran and G.C. Mohan Kumar, Measurement of absolute retardation in photoelasticity using plane polariscope with digital image processing system, Conference INTERFEROMETRY '94, Warsaw, May 16-20, 1994.
33. J. Raamachandran and G.C. Mohan Kumar, Automated photoelastic investigations of human mandible for stresses induced by orthodontic forces, National Symposium on Structural Mechanics, IISc., Bangalore, 158-164, 1994.
34. J. Raamachandran, Kaal [on columns] in Tamil, Third Thamizhaga Ariviyal Peravai, Pondicherry University, Dec. 1994.
35. J. Raamachandran, Kadi Visai:Oli Meetchi Iyal Aayvu [biting force: A photoelastic investigation] in Tamil, 3rd Thamizhaga Ariviyal Peravai, Pondicherry University, Dec. 1994.
36. S. Radhakrishnan and Partha Roy, Correction of scoliosis by different treatment methods - A comparison between 1-D and 3-D finite element approach, J of Automedica, Vol.15,317-326,1994.
37. M.A. Rajagopal, D.B. Kulkarni, K.N. Seetharamu and P.A. Aswatha Narayana, Axisymmetric steady state of thermal analysis to totally enclosed fan cool induction motors using finite element method, 2nd Nat. Conf. on CAD/CAM, PSG College of Tech., Coimbatore, India, Aug 19-20, A2-1 to A2-8, 1994.
38. S. Ramakrishnan, M. Kumaravel and M. Singh, Sequential analysis of aggregation process of erythrocytes in the presence of dextrans and inhomogeneous magnetic field, Reg. Conf.IEEE-EMBS, New Delhi, Feb 15-18, 4.92-4.93, 1995.
39. S. Ramamurti, V. Arunkumar and B.S. Prabhu, New generation aerodynamic foil bearing - An exploratory study, Proc. Nat. Conf. on Air Breathing Engines and Aerospace Propulsion, Trivandrum, Dec. 15-17, 736-742, 1994.
40. V. Ramamurti, P.N. Sreeram and B.K. Kannan, Design aspects and study of medium tonnage mech. press brakes, Jon.Mate. Proc. Tech, Vol. 50, 99-110, 1994.
41. M.R.S. Reddy, S. Radhakrishnan and Ranjana Shukla, A portable - communication aid for the spastics' 1st Regional Conf. of IEEE Engg. in Medicine & Biology Society, IIT, Delhi, Feb 15-18, 36 of JI. of BMESI, 1995.
42. B.V.K. Satya Sai, K.N. Seetharamu and P.A. Aswatha Narayana, Non- darchy natural convection in a porous cavity with constant heat flux on one turbulent wall, National Heat Transfer Conference, Brighton, UK, August 1994.
43. B.V.K. Satya Sai, K.N. Seetharamu and P.A. Aswatha Narayana, Numerical prediction of turbulent natural convection in a square cavity using eulerian fractional step method, Proc. 1st ISHMT- ASME Heat & Mass Transfer Conf. and 12th Nat. Heat and Mass Transfer Conf., Bombay, January 5-7, 1994.
44. S. Senthil and S. Narayanan, Optimal preview control of a two vehicle model, Proc. IUTAM Symposium, University of Bath, "The Active Control of Vibrations", Ed. C.R.Burrows and P.S. Keogh, Institution of Mechanical Engineers, London, 1994, 131-134.
45. S. Shanti, M. Kumaravel and M. Singh, Monte Carlo simulation of laser light distribution in internal organs, Proc. of Reg. Conf. IEEE-EMBS, New Delhi, Feb 15-18, 2.42-2.43, 1995.

46. J. Shanti, K.M. Patil, L.H. Braak and A. Huson, A 3-D two arch model of a normal foot for stress analysis, Proc. of the 1st Regional Conf. of IEEE Engg. in Medicine & Biology Society, IIT, Delhi, Feb 15-18, 3.23-3.24, 1995.
47. J. Shanti, K.M. Patil, L.H. Braak and A. Huson, Analysis of stresses in a 3-D symmetric model of a normal foot, Innov. Tech. Bio. Med., France, Vol. 15, No. 6, 670-683, 1994.
48. J. Shanti, K.M. Patil, L.H. Braak and A. Huson, A 3-D symmetric model of a normal foot for stress analysis, Proc. of the 2nd World Conf. of Biomechanics, Amsterdam, The Netherlands, Vol. 1, 231b, 1994.
49. M. Singh and M. Kumaravel, Sequential analysis of erythrocyte aggregation mechanism in presence of inhomogeneous magnetic field, 2nd World Cong. Biomechanics, Amsterdam, The Netherlands, July 10-15, 110, 1994.
50. M. Singh and M. Kumaravel, A computerized system for sequential analysis of aggregation of erythrocytes under dynamic conditions, Comput. Biomed. Res. 27; 325-336, 1994.
51. M. Singh, J. Middleberg, G. Ramachandran and H.J. Rath, Influence of normal - to microgravity transition on the shape and mobility of erythrocytes and aggregates, Intl. Workshop on short term experiments under microgravity, Bremen, Germany, July 4-7, 1994.
52. M. Singh and B. Prakash, Analysis of blood flow in glass capillaries and micro vessels by axial tomographic and image velocimetry techniques, In: Biofluid Mechanics. D.Liepsch (ed). VDI Verlag, Dusseldorf, 130-133, 1994.
53. M. Singh and H.J. Rath, Analysis of aggregation mechanism of erythrocytes under normal and microgravity conditions, 30th COSPAR meeting, Hamburg, Germany, July 11-21, 1994.
54. M. Singh and K. Sampathkumar, Online characterization of biological tissues with a He-Ne laser light reflectometer, Opt. Engg. 33; 1921-24, 1994.
55. N. Sivaprasad, P. Sashikant and V. Ramamurti, Stress distribution in interface joints, 535-540, 1994.
56. C.F. Starmer, M.R. Reddy, A. Namasivayam and M. Singh, Potassium channel blockade amplifier cardiac instability: Numerical studies of torsades/de points, Ind. J Phy. Pharmacol. 38; 259-266, 1994.
57. H.K. Suhas, P. Balan, J.G. Jagadeesh and V. Ramamurti, Modal methods of analysis of cyclic symmetric structures, Comp. & Structure, 67-77, 1994.
58. H. Sujana, S. Swarnamani, Sheila John and S. Suresh, Ultrasonic Image Parameters for differentiating intraocular Melanoma, 1st Regional Conf. IEEE EMBS and 14th Conf. Bio.Engg. Soc. India, Delhi, Feb. 15-18, 1995.
59. C. Sujatha, S. Swarnamani and Varughese Job, Drill Wear monitoring through vibration parameters, Proc. 16th AIMTDR Conference, Dec. 8-10, 1994, Bangalore, India, 510-597.
60. N.V.C. Swamy, P.A. Aswatha Narayana and Bhaskar Banerjee, Analysis of circular shape profiles in a darrieus vertical axis wind turbine, 29th Indian Society of Theoretical & Applied Mechanics Conf., Vishakapatnam, MS 09, Dec. 1994.
61. V.J. Thomas, P.R. Vaya and M. Singh, Development of biosensor for glucose estimation, Proc. of Regional Conf. IEEE-EMBS, New Delhi, Feb 15-18, 4.51-4.52, 1995.
62. M.J. Tummers, D.M. Passchier and P.A. Aswatha Narayana, Three component LDS measurements of mean turbulence quantities, time and spatial correlation functions in the wake of a flat plate in an adverse pressure gradient, Seventh International Symposium and Applications of laser techniques to Fluid Mechanics, Lisbon, Portugal, July 1994.
63. K. Yashodadevi and M. Singh, A low cost portable instrument for measurement of hematological parameters, Proc. of Regional Conf. IEEE-EMBS, New Delhi, Feb 15-18, 1.85-1.86, 1995.

4.3 Chemical Engineering Department

4.3.1. Introduction

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

4.3.2. Details of Faculty

Name and Qualifications

Major Area of Specialisation

Professors

M.S. Ananth, Ph.D(Florida)

Thermodynamics

A. Baradarajan, Ph.D(IIT Madras)

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

Ch. Durgaprasada Rao,
Ph.D(Andhra)[Head]

Mathematical Modelling, Computer Process Control

Y.B.G. Varma, Ph.D(IIT Madras)

Multiphase Systems, Process Development, Equipment
Design

T. Venkatram, Ph.D(IISc)

Process Development, Heat Transfer, Membrane
Separation, Equipment Design

Associate Professors

A.R. Balakrishnan, Ph.D(Waterloo)

Heat Transfer, Computer Aided Design

M.Chidambaram, Ph.D(IISc)

Non-Linear Control, Periodic operation of Reactors

K. Krishnaiah, Ph.D(IIT Madras)

Chemical Reactor Analysis and Design, fluidization

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

Particle Technology, Environmental Engineering

N.R.Neelakantan, Ph.D(Swansea)

Polymer Processing, Rheology

V.S.Ramachandra Rao, Ph.D(IIT Madras)

Internal Model Control, Adaptive Control

T.K.Ramanujam, Ph.D(IIT Madras)

Environmental Engineering, Particle Technology

T. Panda, Ph.D(IIT Delhi)

Biochemical Engineering and Bio Technology, Protoplast
Fusion Technology

S.Subba Rao, Ph.D(Connecticut)

Mass Transfer, Computer Aided Design

R. Vedaraman, Ph.D(IIT Madras)

Particle Technology, Mineral processing

Assistant Professors

S.K.Rakshit, Ph.D(IIT Delhi)

Biochemical Engineering and Biotechnology, Downstream
processing

P.Sesha Talpa Sai, Ph.D(IIT Madras)

Chemical Reactor Analysis and Design, Rotary kilns

S.Sankaranarayanan, Ph.D(Queensland)

Optimum Control of Grinding Circuits and other Mineral
Beneficiation Process

R.Subramanian, Ph.D(IIT Madras)

Polymer Development

T.Swaminathan, Ph.D(IIT Kanpur)

Environmental Management, Biotechnology, Membrane
Technology

4.3.3. Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D	3	-	10	-	11	1	9	1	8	1	41	4	45
M.S.	10	1	3	-	1	-	-	-	1	-	15	1	16
M.Tech	21	3	8	5	-	-	-	-	-	-	29	8	37
B.Tech.	42	4	50	4	46	3	40	5	-	-	178	16	194
Total	76	8	71	10	58	4	49	6	9	1	263	29	292

4.3.4. Number of Scholarship/Fellowship holders

Programme	Institute Scholarship	Others	Total
Ph.D	29	4	33
M.S.	14	-	14
M.Tech	46	-	46
Total	89	4	93

4.3.5. Number of Degrees Awarded

Programme	Number
Ph.D	10
M.S.	02
M.Tech.	19
B.Tech.	31
Total	62

4.3.6 Short-term Courses/Workshops/Seminars/Symposia/Conferences organised

S.No.	Coordinator(s)	Title of Course/Workshop/Seminar/ Symposia/Conference
1.	Dr.Y.B.G.Varma	Presentation of facilities at the Dept. of Chem. Engg.

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

SI.No.	Name of Faculty	Title	Period/Duration
1.	Dr.T.K.Ramanujam	Waste Water Treatment	2 Mar. 1994
2.	Dr.T.Panda	Cell cycle/Genome size Analysis	7 June 1994
3.	Dr.T.Panda	Apoptosis	14 June 1994
4.	Dr.T.Panda	Polyclonal Antibody	13 July 1994
5.	Dr.T.Panda	Swine & Bovine T-Cell Subset Analysis	10 Aug. 1994
6.	Dr.D.V.S.Murthy	Advances in Chemical Engg.	9-11 Aug.1994
7.	Dr.S.S.Narayanan	Recent Developments in Mineral Process and Future Trends Nagpur	3-6 Oct. 1994
8.	Dr. Ch.D.P.Rao	CHEMCON 94 Kharagpur	14-17 Dec. 1994

Sl.No.	Name of Faculty	Title	Period/Duration
9.	Dr.M.S.Ananth	CHEMCON 94 Kharagpur	14-17 Dec. 1994
10.	Dr.D.V.S.Murthy	CHEMCON 94 Kharagpur	14-17 Dec. 1994
11.	Dr.T.K.Ramanujam	Conservation and Sustainable Development of coastal Resources	14-17 Dec. 1994

4.3.9. Special Lecture(s) Delivered

Sl.No.	Name of the Faculty	Topic of Lecture	Delivered at	Date
1.	Dr.A.R.Balakrishnan	Individual HTC in packed beds	BARC, Bombay	Jan.3-5 1994
2.	Dr.T.Swaminathan	Treatment of waste water from Tanneries	SISI Madras	Jan.94
3.	Dr.T.K.Ramanujam	Waste Water Reclamation and Reuse	ISRO, B'lore	Mar.2,94
4.	Dr.D.V.S.Murthy	Environmental Impact Assesment	NPC, Madras	Nov.94
5.	Dr.T.Panda	Site-directed Mutogenesis	MIT, Cambridge	Nov.17,94
6.	Dr.T.Panda	Site-specific Mutogenesis	Wisconsin, Madison	Nov.29,94
7.	Dr.T.Swaminathan	Miocrobial Degradation of Pesticide waste water	MICON, Mysore	Nov.94

4.3.10 Visits Abroad

Sl. No.	Name of the Faculty	Country Visited	Date	Purpose of Visit
1.	Dr.A.R.Balakrishnan	UK	Aug.18-22 1994	10th IHTC
2.	Dr.T.Panda	USA	Jan.-Dec. 1994	Collaborative Research

4.3.11. Distinguished Visitors to the Department

Sl. No.	Name of the visitor and Occupation	Date of visit	Purpose of visit (Lecture/Discussion)
1.	Prof.Dr-Ing.L.R.Oellrich University of Kalsurhe, Germany	Feb.02, 1994	Lecture
2.	Dr.K.Ganesan USAID Fellow	Nov.11,1994	Lecture
3.	Dr.David C Wilson ERM. UK	March 03,1995	Lecture
4.	Dr.Pramod D Wagnikar University of Iowa USA	March, 1995	Lecture

4.3.12. Sponsored Projects: under Progress

S.No.	Title	Funding Agency	Amount (In lakhs)	Coordinator(s)
1.	Three phase fluidisation	DST	2.53	Dr.Y.B.G.Varma Dr.M.S.Ananth

S.No.	Title	Funding Agency	Amount (In lakhs)	Coordinator(s)
2.	Radially pulsed columns	DAE	5.15	Dr. Y.B.G.Varma Dr.A.R.Balakrishnan
3.	Maldistribution in radial flow reactors	EIL	5.00	Dr.Y.B.G.Varma Dr.S.Subba Rao
4.	Effect of surface roughness on boiling heat transfer	DAE	4.21	Dr.A.R.Balakrishnan Dr.V.M.K.Sastry
5.	Alternative to CFC's	Indo-German	-	Dr.A.R.Balakrishnan Dr.S.S.Muthy
6.	Robust control of desalination plants	AbuDhabi UAE	7.13	Dr.M.Chidambaram
7.	Utilization of renewable resources: Activated carbon from coconut shells	CSIR	2.17	Dr.K.Krishnaiah
8.	Effect of axial feed entry Germany on hydrocyclone performance	-	-	Dr.S.S.Narayanan
9.	Studies in Additive Grinding of minerals	SAIL	-	Dr.R.Vedaraman
10.	Generation of Biogas from tannery waste water	DNES	7.0	Dr.D.V.S.Murthy
11.	Evaluation of Bioreactors for hazardous waste treatment	CSIR	4.25	Dr.T.Swaminathan
12.	Development of high productivity process for lactic acid	DBT	22.22	Dr.S.K.Rakshit Dr. T. Swaminathan
13.	Studies on flow behaviour of raw coal from Bunkers	CBID	4.3	Dr.T.K.Ramanujam
14.	Environmental Engineering	MHRD	10.0	Dr.T.K.Ramanujam

4.3.13 Major Consultancy Assignments

S.No.	Title	Organisation	Amount	Coordinators
1.	Project Evaluation	Midas Rubber Pvt.Ltd.	0.1	
2.	Project evaluation	United Insurance	0.1	
3.	Designing of Pipe line and storage tanks for chemicals	SPIC	4.0	Dr. S. Subba Rao Dr. V.S. Raju
4.	150 TPD PFBC	BHEL	12.0	Dr. K. Krishnaiah Dr. V.M.K. Sastri Dr. A. K. Kolar
5.	Extraction of Neem zol	EID	0.10	Dr. K. Krishnaiah Dr. M.S. Ananth
6.	Evaluation of Mechanical properties of polypropylene	SSI Madras	0.03	Dr. N.R. Neelakantan
7.	Monitoring the execution of graphite beneficiation project	TAMIN	20	Dr. R. Vedaraman Dr. T.K.Ramanujam
8.	Common effluent treatment plant	TALCO TNPCCB	-	Dr. K. Krishnaiah Dr. T. Swaminathan

4.3.14. Research Publications

1. Y.B.G.Varma, A.R.Balakrishnan and P. Sivagnanam, "On the mechanism of subcooled flow boiling in binary mixtures", *Int. J. Heat and Mass Transfer*, 37, 681-689, 1994.
2. Y.B.G.Varma, S. Subba Rao and C. Srinivasakannan, "A study of stable range of operation in multistage fluidised beds", *powder Technol.*, 78, 203-211, 1994.
3. Y.B.G. Varma, S. Subba Rao and C. Srinivasakannan, "A kinetic model for drying of solids in batch fluidised beds", *Ind. Eng. Chem. Res.*, 33, 363-379, 1994.
4. M. Sadasivam and A.R. Balakrishnan, "Experimental investigation on the thermal effects in packed bed liquid desiccant dehumidifiers", *Ind. Eng. Chem. Res.*, 33, 1636-1640, 1994.
5. M. Chidambaram, Nonlinear IMC of nonminimum phase system, *Ind. Chem. Engr*, 36, 127-130, 1994.
6. Y.S.N.M.Rao and M. Chidambaram, Robust-Control of a pH process, *Ind. J. Chem. Tech.*, 2, 6-10, 1994.
7. V. Midha and M. Chidambaram, "Periodic operation of transport reactor for auto catalytic reactors", *Ind. J. Chem. Tech.*, 2, 11- 17, 1994.
8. S. Anand and M. Chidambaram, "Optimal allocation of a PWR cooling loop using a multistage monte carlo method, *Microelect and Reliab.*, 34, 741-745, 1994.
9. M Chidambaram, "Control of P and PI controller for unstable first order delay systems, *Int. J. Contr.*, 60, 37-39, 1994.
10. M. Chidambaram, "Periodic operation of tubular reactors for catalytic reactions, *Can. J. Chem. Engg.*, 71, 947-976, 1994.
11. G. Muralikrishnan and M. Chidambaram, "Control of bioreactors using a neural network model, *Bioprocess Engg*, 10, 225-228, 1994.
12. M. Chidambaram and G.P. Reddy, Control of nonlinear system with input multiplicities, *Comp. and Chem. Engg.*, 19, 249-252, 1994.
13. G.P. Reddy and M. Chidambaram, "Nonlinear control of bioreactors with input multiplicities", *Bioprocess Engg.* 11, 97-100, 1994.
14. M. Chidambaram, "Design of PI Controller for an integrator dead time process", *Hung. J. Ind. Chem*, 22, 37-39, 1994.
15. K.. Soundarajan and K. Krishnaiah, "Hydrodynamics of turbulent contactor: Flooding aspects", *Can. J. Chem. Engg.*, 72, 569-575, 1994.
16. P. Padmini, S.K. Rakshit, K. Krishnaiah and A. Baradarajan, "Studies on a continuous recycle reactor for a lipase catalysed processing of rice bran oil, *Bioprocess Engg*, 11, 39-44, 1994.
17. G.D. Surender, A.D. Damodaran and P.S.T. Sai, "Kinetics and structural changes in catalyst-aided carbothermal reduction of ilmenite ore, *Hum. J. Ind. Chem.*, 23, 35-40, 1995.
18. Ajay Lakshmanan, M. Babu Srinivas, T. Venkatram and C.A. Sastry, Desalination of Brackish water by reverse osmosis, *Ind. J. Env. pro.*, 12, 572-576, 1992.
19. G. Kumar, N.R.Neelakantan and N. Subramanian, "On the Compatilisation and Dynamic Vulcanisation of polyacetal/Ethylene propylene Diene Tenpocymen Blends", *J. App. Poly. Sci.*, 52, 483- 490, 1994.

20. V.V.Chaturvedi and D.V.S. Murthy, "Studies in lime mud utilisation", *Ind. J. Tech.*, 1, 115-117, 1994.
21. S.Srinivas, M.Kapleswar and D.V.S.Murthy, "Plume dispersion modelling for better stack designs", *Inst. of Congr. J.*, 74, 76- 80, 1994.
22. A.Sivakumar, T.Srinivasa Raghavan, T.Swaminathan and A.Baradarajan, "Extended monod kinetics for substrate inhibited systems", *Bioprocess Engg.*, 11, 165-166, 1994.
23. M.Velan and T.K.Ramanujam, "Influence of Reactor Geometry on mixing characteristics in a downflow loop Bioreactor : Newtonian and Non-newtonian fluids", *Bioprocess Engg.*, 11, 101-106, 1994.
24. K.Yagnaprasad and T.K.Ramanujam, "Liquid circulation velocity and overall gas holdup in a modified jet loop Bioreactor with low density particles", *Bioprocess Engg.*, 10, 131-138, 1994.
25. J.Anjanikumari and T.Panda, "Analysis of factors responsible for the regeneration of intact cells from sphaeroplasts of *Sachharomyces cerevisiae*", *Bioprocess Engg.*, 10, 15-20, 1994.
26. D.Subba Rao and T.Panda, "Critical analysis of the effect of metal ions on gluconic acid production by *Aspergillus niger* using a treated Indian cane molasses", *Bioprocess Engg.*, 10, 99-107, 1994.
27. K.Theodore and T.Panda, "Production of β -1,3 glucanase from *Trichoderma harzianum* in surface and submerged culture processes and its role on protoplast generation from *Trichoderma reesei* mycelium", *Bioprocess Engg.*, 10, 161-167, 1994.
28. K.Theodore and T.Panda, "Statistical optimization of production medium for β -1,3 glucanase synthesis by *Trichoderma harzianum*", *Biotech. Techn.*, 8, 381-384, 1994.
29. D.Subba Rao and T.Panda, "Comparative analysis of different whole cell immobilized *Aspergillus niger* catalysis for gluconic acid fermentation using pretreated can molasses", *Bioprocess Engg.*, 11, 209-212, 1994.
30. J.Anjanikumari and T.Panda, "Intergeneric hybridization of *Trichoderma reesei* QM 9414 a *Saccharomyces cerevisiae* NCIM 3288 by protoplast fusion, *Enz. & Micro. Technol.*, 16, 870-882, 1994.

4.4 Chemistry Department

4.4.1. Introduction

The Department of Chemistry was established in 1961. Now Ph.D. and M.Sc. programmes are being offered. The major areas of teaching and research of the Department are:

Analytical and Radiochemistry	Catalysis
Organic Chemistry	Polymer Chemistry
Biochemistry	Chemical Kinetics
Photochemistry	Spectroscopy
Electrochemistry	Theoretical Chemistry,
Inorganic Chemistry	

4.4.2. New Courses Introduced

CY 672	Environmental Biotechnology
CY 681	Environmental Chemistry Laboratory (Civil Engg. Deptt)
CY 738	Current Concepts in Biochemistry and Biotechnology

Six new 800 level courses were introduced.

4.4.3. Details of Faculty

Name and Qualification	Specialisation
Professors	
K.K.Balasubramanian, Ph.D.(Madras)	Organic Chemistry, Synthesis, mechanisms, Photochemistry
M.S.Gopinathan, Ph.D.(IIT Kanpur)	Theoretical Chemistry
C.Kalidas, Ph.D.(Jadavpur)	Thermodynamics, Electrochemistry and Fast Reaction Kinetics
P.T.Manoharan, Ph.D.(Columbia)	Theoretical Chemistry, Spectroscopy
C.N.Pillai, Ph.D.(Northwestern)	Organic Chemistry, Catalysis
T.V.Ramakrishna, Ph.D.(Birmingham) [Head]	Analytical and Environmental Chemistry
M.Ramakrishna Udupa, Ph.D.(IIT Madras)	Inorganic Chemistry
D.V.Ramana, Ph.D.(IIT Madras)	Organic Chemistry, Organic mass spectrometry and organic synthesis
R.Ramaswamy, Ph.D.(IIT Madras)	Electrochemistry, Oscillatory Reactions
C.S.Swamy, Ph.D.(IISc)	Surface Chemistry, Catalysis
C.S.Venkatachalam, Ph.D(IIT Madras)	Thermodynamics and Electrochemistry and Electro-organic reactions
B. Viswanathan, Ph.D.(IIT Madras)	Surface Science, Catalysis, Solid State Chemistry, Hydrogen Energy
Professors (Adjunct)	
T.K.K.Srinivasan, Ph.D.(Banares)	Theoretical Chemistry, Spectroscopy

Name and Qualification	Specialisation
S. Subramanian, Ph.D. (Leicester)	Theoretical Chemistry, Spectroscopy, Magnetic Resonance
Surjit Singh, Ph.D. (IIT Kanpur)	Theoretical Chemistry, Spectroscopy
Associate Professors	
N. Balasubramanian, Ph.D. (IIT Madras)	Analytical and Environmental Chemistry
(Mrs.) Chandra Sainathan, Ph.D. (IISc.)	Biochemistry
S. Vancheesan, Ph.D. (IIT Madras)	Inorganic Chemistry, Catalysis
T.K. Varadarajan, Ph.D. (IIT Madras)	Catalysis
Assistant Professors	
Archita Patnaik, Ph.D. (B.H.U.)	Nuclear and Radiochemistry
(Mrs.) K. Lalitha, Ph.D. (Mysore)	Biochemistry
D. Loganathan, Ph.D. (IIT Bombay)	Organic Chemistry
A.K. Mishra, Ph.D. (IIT Kanpur)	Photochemistry
S. Sankararaman, Ph.D. (Victoria)	Organic Photochemistry
M.V. Sangaranarayanan, Ph.D. (IISc)	Theoretical Electrochemistry
M.S. Subramanian, Ph.D. (IIT Madras)	Analytical and Radiochemistry
M.N. Sudheendra Rao, Ph.D. (IISc)	Inorganic Chemistry
N. Sundaram, Ph.D. (IIT Madras)	Organic Chemistry, Synthesis and Mass Spectroscopy
G. Sundararajan (Rutgers)	Organometallic Chemistry
K. Vidyasagar, Ph.D. (IISc)	Synthetic and Structural Solid State Chemistry
R.P. Viswanath, Ph.D. (IIT Madras)	Catalysis
Visiting Faculty	
Pradeep Thalappil, (IISc Bangalore)	Physical Chemistry, Molecular and Electron Spectroscopy and Mass Spectrometry

During the year under review the following Professors retired after superannuation:

1. Dr. R. Narayan
2. Dr. C. Kalidas
3. Dr. C.N. Pillai

4.4.4 Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D.	9	10	13	10	12	7	10	9	20	11	64	47	111
M.Sc.	12	15	14	9	-	-	-	-	-	-	26	24	50
Total	21	25	27	19	12	7	10	9	20	11	90	71	161

4.4.5. Number of Scholarship/Fellowship holders

Programme	Institute	CSIR Fellowship	Others	Total
Ph.D.	70	20	3	93
M.Sc.	21	-	-	21
Total	91	20	3	114

6. No. of Degrees Awarded

Programme	Number
Ph.D	10
M.Sc.	21
Total	31

4.4.7 Instruments/Equipments Designed and Developed

A simple self-diffusion (tracer diffusion apparatus), FT-EPR equipment, Varian Gel Permeation Chromatograph VISTA 5000, new Schlenck line instrument.

4.4.8. New facilities added and major equipment procured

A radio-gas chromatography system with special target assembly for cyclotron ion irradiation, six major equipments with (Deep freezer, high voltage power supply, anaerobic glove-box, large autoclave, pilot refrigerated shaker, BOD Vacuum Oven, A new PL- 486 system added for networking purposes, New digital station with 5 GH memory, PC AT-486 with WIPRO Epson LQ 1050+ printer, F 4500, Hitachi Spectrofluorimeter, in situ reaction cell attachment for FT-IR spectrometer, gas analysis module/mass spectrometer (Balzers), 'Indfur' electric furnace, 'indfur' programmable temperature control panel.

4.4.9. Short term courses Workshop/Seminars/Symposia/Conferences/Training Attended by the Faculty in recognised Academic Institutions and Public sectors.

S.No.	Name of Faculty	Title	Period/Duration
1.	Archita Patnaik	i. 'Indian Society for Radiation and Photoscience, Department of Physics, Jabalpur University	Feb. 16-18 1995.
		ii. Symposium on nuclear and radiochemistry, Chemistry Division, IGCAR Kalpakkam	Feb. 21-24 1995.
		iii. Project Leaders Meeting, IUC-DAEF Calcutta	March 27- 30 1995.
2.	Dr.T.S.Chandra	i. Biosensors and protein chemistry International Symposium, VHS Madras	March 1994
		ii. Second Asia Pacific Conference on Agricultural Biotechnology M.S. Swaminathan Foundation, Madras	Sept. 1994
		iii IUBMB Congress on Biochemistry and Molecular Biology, New Delhi	
		iv. MICON International Conference, Mysore	Nov. 94.
3.	Dr. K. Lalitha	i. XVII International Congress of Biochemistry and Molecular Biology, New Delhi.	
4.	Dr. D. Loganathan	i. INSA Diamond Jubilee Special Seminar, University of Madras	Jan. 27 1995
		ii. Fifth National Symposium on Bio-organic Chemistry, Shivaji Univ. Kolhapur	Feb. 24-25 1995.
5.	Dr. P.T.Manoharan	Frontiers in Physical Chemistry, Short- Term Course	Dec. 19-29 1994.
6.	Dr. C.N. Pillai	i. International Conference on Surface and Colloid Science and its relevance to soil pollution, (IUPAC) CLRI Madras	March 1994.

S.No.	Name of Faculty	Title	Period/Duration
		ii. National Conference on Nonconventional Methods of Activation and use of unusual media in Chemistry, IIT Madras	Dec. 1994
7.	Dr. M.R. Udupa	iii. National Symoisum on Catalysis, BARC Bombay	Dec. 1994.
8.	Dr. D.V.Ramana	31st Annual Convention of Chemists, BHU, Varanasi	1994
		Industrial Environmental Applications of Mass Spectromtery, IGCAR Kalpakkam	Feb.28 1995
9.	Dr. R. Ramaswamy	i. Fifth International Symposium on Advances of Electrochemical Science and Technology, Taj Coromandal, Madras	Nov. 24-26 1994.
		ii. National Seminar on Trends in Electrochemistry, Karaikudi	23 Dec. 1994.
		iii. National Symposium on Electrochemistry iin Marine Environment, Hotel Breeze, Madras	Feb. 7,8 1995
10.	Dr.M.VSangaranarayana	Fifth International Symposium on Electrochemical Science and Technology, Taj Coromandal	Nov. 24- 26 1994.
11.	Dr. S. Sankararaman	i. Non-Conventional Methods of activation and Use of unusual Media in Chemistry, IIT Madras	Dec. 1-2 1994.
		ii. 10 th International Conference in Organic Synthesis, (IUPAC) IISc Bangalore	Dec. 11-16 1994.
12.	Dr.M.S. Subramanian	Nuclear and Radiochemistry Symposium, IGCAR Kalpakkam	Feb. 21-24 1995.
13.	Dr. M.N.S. Rao	Non-Conventional Methods of activation and Use of unusual Media in Chemistry, IIT Madras	Dec. 1-2 1994.
14.	Dr. G. Sundararajan	i. Fourth NOST Conference, Dehradun	March 14-17 1994.
		ii. Block copolymerisation of with metal catalysts, Dept. of Chemistry, Women's Christian College, Madras	Sep. 22
15.	Dr.C.S. Swamy	i. 12th National Symposium of the Catalysis Society of India, BARC Bombay	Dec. 19-22 1994.
		ii. Indo-British Seminar on Catalysis and Environment, IICT Hyderabad	Jan. 30-31 1995.
16.	Dr.S.Vancheesan	Pre-IUPAC Symposium on metal-mediated Organic Synthesis, NCL Pune	Dec. 8-9 1994
17.	Dr. T.K. Varadarajan	i. 12th national Symposium on Catalysis, BARC Bombay	Dec. 1994.
		ii. Non-Conventional Methods of activation and Use of unusual Media in Chemistry, IIT Madras	Dec. 1-2 1994.
		iii. Fifteenth IUPAC Symposium on photochemistry, Prague, Czechoslovakia	July 1994.
		iv. Indo-British Seminar on Catalysis and Environment, IICT Hyderabad	Jan. 30-31 1995.
18.	Dr.C.S.Venkatachalam	Fourth NOST Conference Dehradun	March 14-17 1994.
19.	Dr. B. Viswanathan	i. Chemical and Electrochemical Energy Systems Shorterm Course	14-17 March 1994
		ii. 12th national Symposium on Catalysis BARC	Dec. 1994
		iii. National Symposium on Power Plant on Fly Ash Utilisation on Waste Heat Recovery Systems	Feb 17 1995.

S.No.	Name of Faculty	Title	Period/Duration
	Dr. B. Viswanathan	vi. Non-Conventional Methods of activation and Use of unusual Media in Chemistry, IIT Madras	Dec. 1-2 1994.
		v. Indo-British Seminar on Catalysis and Environment IICT Hyderabad	Jan 30-31 1995
		vi. 26th National Seminar on Energy, Madras	Jan. 1994.
		vii. National seminar on New Trends in Dynamic and Structural studies in Inorganic and Physical Systems, Madurai Kamaraj University	March 1995.
		viii. Twelfth National Symposium on Catalysis, BARC	1994.
		ix. Seminar on Polymers, Catalysis, Bio-active molecules and Bio-inorganic Chemistry, Department of Chemistry, M.S. Univ. Baroda	Aug. 1994
		x. Twentysixth national seminar on Energy, Madras	1994.

4.4.10. Invited Lectures Delivered by the Faculty in Academic Institution/Public Bodies

SI.No.	Name of Faculty	Topic of the Lecture	Delivered at	Date
1.	Dr. Archita Patnaik	i. Nuclear Fusion - An Option for Tomorrow's World	IIT Madras	June 19-30 1994.
		ii. Nuclear spectroscopy using Positron Beams	RSIC IIT Madras	Dec. 29 1994.
		iii. Radio-analytical approaches to Space Research (Simulation Experiments)	Sambalpur University, Orissa	Dec. 9- 10 1994.
2.	Dr. T.S. Chandra	i. Path of carbon in Nature	University of Madras	Dec. 13 1994.
		ii. Xylanases - Present scanario	University of Madras	Dec. 14 1994.
3.	Dr. M.S. Gopinathan	i. Strange attractions in Chemistry and Biology	University of Pune	Dec. 16 1994.
		ii. Basis of Spectroscopy; Valence Theory and Molecular Orbital theory	Cochin University	Nov. 18 1994.
		iii. Chaos in Chemical and Biological Systems; Theory of Chemical Valence	Bharathidasan Univ. Trichy	March 13 1995.
4.	Dr. K. Lalitha	i. Plant Bio-mass and environmental Biotechnology	TNAU Coimbatore	August 1994.
		ii. Current concepts in selenium biochemistry	Avinashilingam College for Home Science, Coimbatore	Sep. 1994.
		iii. Biological Detoxification Mechanisms	SPIC-Pharma	1994.
		iv. Environmental Biotechnology	Tamil Nadu Pollution Control Board	March 1995.
5.	Dr.D.Loganathan	Exploring the structural basis of Carbohydrate Protein Interaction	SPIC Pharma	July,15 1994

Sl.No.	Name of Faculty	Topic of the Lecture	Delivered at	Date
6.	Dr. P.T. Manoharan	i. Group Theory and chemical applications	Sri Venkateswara Univ Tirupathi	April 1994.
		ii. Raman Resonance Spectroscopy	CLRI Madras	April 1994
		iii. ESR Spectroscopy	Mahatma Gandhi Univ. Kottayam	March 1995.
		iv. Raman Spectroscopy	Mahatma Gandhi Univ. Kottayam	March 1995.
		v. Modelling of Haemocyanins	Cochin University	March 1995.
		vi. Reconstituted Hb-A Spectroscopic Approach	Madurai Kamaraj Univ. Madurai	March 1995.
		vii. Spin and Molecular Dynamics in Cu (II) and Cu (I) spins	Pondicherry Univ. Pondicherry	March 1995.
7.	Dr. A.K. Mishra	Photophysics of Aromatic Fluorophores in Organised Media	Sambalpur Univ. Orissa	March 24-25 1995.
8.	Dr. C.N. Pillai	Use of zeolites in Petroleum and Petrochemical Industries	Rm. Adhinarayanan Endow. Lectures, Annamalai Univ.	Feb. 1994.
9.	Dr. R. Ramaswamy	Oscillatory Reactions	A.C. College Madras	Jan. 23 1995.
10.	Dr. S. Sankararaman	Diastereoselectivity in Michael addition and aldol condensation	IISc Bangalore	Dec. 14 1994.
11.	Dr. M.N.S. Rao	i. Multiple bonds of silicon - a success story	Karnata Univ. Dharwad	Jan. 10 1995
		ii. Lectures in UGC sponsored Research Course to Teachers	(Bharathidasan, Mysore Karnataka Universities)	1994.
		v. Multiple bond concepts in Transition Metals	Gulbarga Univ.	Dec. 26 1994.
12.	Dr. S. Vancheesan	Applications of iron and chromium carbonyls as catalysts	NCL Pune	Dec. 8-9 1994.
13.	Dr. K. Vidyasagar	Interaction	RSIC IIT, Madras	Dec. 1994

4.4.11 Visits Abroad

Sl.No.	Name of the Faculty	Country Visited	Date	Purpose
1.	Dr. K.K. Balasubramanian	NIST, U.S.A.	1.12.93-30.12.94	Guest Scientist; also delivered lectures at Wayne State University, Detroit; University of Minnesota, Minneapolis; 3-M Corporation, Minneapolis; University of Louisville, Kentucky; University of Tulane, New Orleans; Johnson Mathey Company, Philadelphia
2.	Dr. M.S. Gopinathan	Poland	June 1994	To deliver invited plenary lecture at the International Conference on Density Functional Theory.
3.	Dr. P.T. Manoharan	i. U.S.A.	1994	to deliver lectures at University of Michigan at N.I.H. Blatimore

SI.No.	Name of the Faculty	Country Visited	Date	Purpose
		ii. Japan	June & Nov. 1994	To deliver lectures at Osaka University, Tokyo University, Kanagawa Academy of Sciences and Technology, Kawasaki
4.	Dr.D.V.Ramana	Budapest, Hungary	Aug.28-Sept.3 1994	To present a paper in the 13th International Conference on Mass Spectrometry
5.	Dr.G.Sundararajan	U.S.A.	Aug. Sep. 1994	To deliver lectures at 208th American Chemical Society Meeting at Washington D.C. University of Virginia Charlottesville
6.	Dr.C.S.Venkatachalam	Japan	Sept.27-30 1994	To present a paper at the Second International Symposium on electroorganic symposium at Kurushiki, Japan.

4.4.12. Distinguished Visitors to the Department

S.No.	Date of visit	Name of the Visitor and Occupation	Purpose
1.	15 April 94	Prof. Stanley Cameron Dalhousie Uni Nova Scola Canada	Delivered Lecture
2.	7 April 94	Dr.H.Surya Prakash Rao, Pondicherry University, Pondicherry	Lecture on Stereoselectivity in Cyclic- β keto ester alkylations
3.	15 June 94	Dr.Suresh Vallya Veetil, Max-Planck Institute, Mainz, Germany	Lecture on Design and Synthesis of Molecular Architecture from Crown Ethers to Supra-Molecular Polymers
4.	20 July 94	Dr.Rabindra N. Roy, Missouri, USA	Lecture on Ion Interaction Theory for Mixtures of 1-1, 2-1,3-1 and 4-1 Electrolytes
5.	Aug. 94	Dr.Ashok K. Dhingra and Dr. V.N. Malli Rao, DuPont Research & Development, USA	Lecture and discussion.
6.	Aug. 94	Dr.Claude Barre', President, CEGICHEM, France	Discussion
7.	3 Aug. 94	Dr.Baldwon Robertson, NIST, Gaithersburg, MD, USA	Delivered lectures.
8.	8 Aug. 94	Dr.Ronald P. Mason, Free Radical Work Group Leader, Laboratory of Molecular Biophysics, NIH, USA	Lecture and Discussion
9.	27 Aug. 94	Dr.A.W.Parker, Rutherford University	Discussion
10.	Sep. 94	Prof.Vincent Massey, University of Michigan, USA	delivered lecture
11.	Oct. 94	Dr.Bisaria, V.S. IIT Delhi	Discussion
12.	9 Nov. 94	Prof.S.Shizuka, Gunma University, Japan	Lecture on Hydrogen atom transfer and electron transfer from triplet-naphthalene derivatives and Denzophenones via triplet exciplexes
13.	Dec. 94	Dr.V.Eyrieres, Scientist, France	Delivered lecture.
14.	19 Dec. 94	Prof.Timothy C. Gallagher, U.K.	Lecture on Heterocyclic Building Blocks in Alkaloid Synthesis

S.No.	Date of visit	Name of the Visitor and Occupation	Purpose
15.	Dec 94	Prof.Reginald Mitchell, University of Victoria, Canada	To deliver Lectures
16.	Jan. 95	Dr.Bernard Wood, Director, Development Corporation Direcorate, OECD, France	To visit Catalysis Laboratories and Discuss Indo-German Projects
17.	Jan. 95	Dr.Richard Joseph, Head, CFTRI, Mysore	Delivered lecture
18.	6 Jan. 95	Prof.Harold M. Swartz, Department of Radiology, Dartmouth Medical School, Hanover, New Hampshire, USA	Delivered a lecture
19.	Feb. 95	Dr.Dawe, Reader, Gujarat University	Delivered lectures
20.	Feb. 95	Dr. Bernd Lunkenheimer GTZ, Germany	To discuss about Indo-German projet
21.	17 Feb. 95	Prof.Dr.K.Weighardt, Lehrstuhl fur Anorganische Chemie Fakultat fur Chemie Ruhr-Universitat Bochum, Germany.	
22.	Feb.95	Prof.Frank Berry & Dr.Lesley E.Smart, Department of Chemistry, The Open University Milton-Keynes, U.K.	Delivered lectures
23.	Feb. 95	Dr.P.Massiani, University of P et M. Curie, Laboratoire de Reactivite de Surface, URA 1106 CNRS, Paris, France	Lecture and discussion
24.	Feb. 95	Dr.U.Visweswara Rao, Director Consulting Company, USA	Discussion

4.4.13. Sponsored Projects

S.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Coordinator(s)
1.	Chemical Modifications of fullerenes through nucleae recoil implantation: fundamental mechanism and astro)physical implifications	1995-98	IUC-DAEF		Dr. Archita Patnaik and Dr. S.N. Chintalapidi Director IUC Calcutta
2.	US-India Rupee project	1994-97	-	20.00	Dr.P.T.Manoharan Dr. S. Subramanian
3.	Chemistry of metallocarbohedranes	1995-98	DST	7.05	Dr.P.T.Manoharan Dr. T. Pradeep
4.	Dynamic fluorecence quenching in hetero-aromatic fluorophore-quencher systems in solution	1994-97	DST	3.4316	Dr.A.K. Misra
5.	Modelling electrocatalysis at chemically modified electrodes	1994-97	DST	3.8971	Dr.M.V.Sangaranarayanan

S.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Coordinator(s)
6.	Novel low-temperature methods to synthesise new metastable and known complex metal oxides"	1995-98	DST	4.08526	Dr. K.Vidyasagar
7.	Novel low-temperature synthehsis and structure of new polychalcogenide compounds	1995-98	CSIR	6.90	Dr.K.Vidyasagar
8.	Structure-activity relationship in hetero-poly compounds	1995	DST	5.0	Dr.B.Viswanathan

4.4.14. Major Consultancy Assignments

S.No.	Title	Organisation	Amount (In lakhs)	Coordinator(s)
1.	Mould growth tests	M/s Lucas TVS	0.07	Dr.T.S.Chandra
2.		M/s Shasun Chemicals and Drugs Ltd. Madras	0.025	Dr.P.T.Manoharan
3.		M/s Coronation Printing Ink Manufacturing Co. Sivakasi	0.20	Dr.P.T.Manoharan
4.	Methanol fuel cells	High Energy Batteries	0.90	Dr. M. V. Sangara narayanan B. Viswanathan
5.	Development of fluidized bed-furnaces	M/s Fluidtherm, Madras		Dr.B.Viswanathan
6.	Development of PTFE substrates	M/s Hindusthan Fluorocarbons		Dr.B.Viswanathan
7.	Commercialisation of dielectric resonators	M/s ACC Ltd.		Dr.B.Viswanathan
8.	Devices using Dielectric Materials	M/s Vintek Microwave Corporation		Dr.B.Viswanathan
9.	Development of fly-ash based bricks	M/s Vega Enetrprises and Brick Manufacturer Association of Madras		Dr.B.Viswanathan
10.	Development of suitable materials for use for flooring in railway carriages	Southern Rilway, Madras		Dr.B.Viswanathan

4.4.15. Honours and Awards

S.No.	Name of Faculty	Honours/Awards	Purpose
1.	Dr.T.S.Chandra	best research paper award	MICON International Conference
2.	Dr. M.N.S. Rao	invited to write a review article in main group chemistry for the journal Coordination Chemistry Reviews.	

4.4.16. Research Publications

1. K.K. Balasubramanian, N.G. Ramesh, A. Pramanik and J.Chandrasekar, "Aromatic Claisen rearrangement in carbohydrates- stereocontrol of rearrangement rates in unsaturated sugar derivatives", J.C.S. Perkin Trans. II, (1994) 1399
2. S. Sowmya and K.K. Balasubramanian, "Micro-wave induced Ferrier rearrangement", Synthetic Communications, vol. 24,(1994) 2097.
3. N. Bhuvanewari, C.S. Venkatachalam and K.K. Balasubramanian, A new route to O-allenyl phenols", J.C.S. Chem. Commun., (1994) 1177.
4. T. Balasubramanian and K.K. Balasubramanian, "Tandem transformations of N-alkyl N-allenylmethyl anilines to N-alkyl-2- ethynylindoles", J.C.S. Chem. Commun., (1994) 1237.
5. K.C. Santhosh and K.K. Balasubramanian, "A facile and stereoselective synthesis of aryl ethers of vicinal bromohydrins by Mitsunobu reaction", Synthetic Communications, vol. 24 (1994) 1049.
6. N. Bhuvanewari, C.S. Venkatachalam and K.K. Balasubramanian, "Novel electrochemical route to 2-alkoxyallyl-phenols-cathodic eliminative ring-opening reactions", Tet. Lett. vol 35 (1994) 1409.
7. S. Dhanalakshmi, C.S. Venkatachalam and K.K. Balasubramanian, "Cation radical induced Claisen rearrangement of aryl- allenyl-methyl ethers", J.C.S. Chem. Commun., (1994), 511.
8. T. Rajamannar and K.K. Balasubramanian, "Synthesis of Wieland- Miescher ketone analogues-potential substrates for the carbocyclic frameworks", Syn. Commun., vol. 24, (1994) 279.
9. T. Rajamannar and K.K. Balasubramanian, "Intramolecular competitive addition of vinyl radicals to keto and alkenyl groups in Wieland-Miescher ketones-synthesis of carbocycles and propellanes", J.C.S. Chem. Commun., (1994) 25.
10. T. Rajamannar and K.K. Balasubramanian, "An unusual radical fragmentation of 8a-cyclo alkenyl methyl Wieland-Miescher ketones mediated by tri-n-butyl-tin hydride", Tet. Lett., vol.25 (1994) 637.
11. N. G. Ramesh and K.K. Balasubramanian, "Mitsunobu reaction of 1, 5- anhydro-3, 4, 6-tri-O-benzyl- 2-deoxy-2-hydroxymethyl -hex-1-enitols and 1, 5-anhydro-deoxy-4 6-O-protected-hex-1-enitols-a novel method for the synthesis of 2-c methylene glycosides and an useful alternative to Ferrier rearrangement", Tet. vol.51, (1995) 255.
12. P. Padmaja, N. Balasubramanian and T.V. Ramakrishna. "Chemical enhancement method for the determination of mercury after iodide extraction" Talanta, vol. 41, (1994) 255.
13. S. Nalini, N. Balasubramanian and T.V. Ramakrishna, "Chemical enhancement method for spectrophotometric determination of antimony at nanogram levels", Fresenius Journal of Analytical Chemistry, vol. 348 (1994) 769.
14. K. Shanthi and N. Balasubramanian, "A new coupling agent for nitrite determination", J. of A.O.A.C. Intern. vol. 77 (1994) 1639.
15. K. Chandra Raj and T.S. Chandra, "A cellulose-free xylanase from alkali - tolerant *Aspergillus fischeri* Fxn 1", Biotechnol. Lett., vol. 17 (1995) 309.
16. M.S. Gopinathan, "Dynamics from experiment: Iteration maps in correlation space", Proceed. Ind. Acad. Sci. (chem. Sci.) vol.106 (1994) 479.

17. K. Lalitha, K.R. Swaminathan and K.R. Padmabhai, " Kinetics of biomethanation of solid tannery waste and the concept of interactive metabolic control", *Appl. Biotech.*, vol 47 (1994).
18. K. Lalitha, P. Rani and Vasanthi Narayanaswamy, "Metabolic relevance of selenium in the insect *Corcyra Cephalonica*-of uptake of ⁷⁵Se and sub-cellular distribution", *Biol. Trace Elem. Res.* vol. 41, (1994) 217.
19. K. Lalitha, K.R. Swaminathan, C.M. vargheese, V.P. Shanthai and R. Padmabhai, "Methanogenesis mediated by methylotrophic mixed culture", *Appl. Biochem. and Biotechn.*, vol. 49 (1994)113.
20. S. Venkatachalam, K.V.C. Rao and P.T. Manoharan, "ESR and magnetic properties of phthalocyanine polymers" *J. Polym. Sci. and Polym. Phys. Ed. part B: Polymer Physics*, 32 (1994) 37.
21. S. Sankarapandi, J. Rifkind and P.T. Manoharan, "Thermodynamics of some long)chain biradicals studied by EPR spectroscopy", *Proc. Ind. Acad. Sci., (Chem. Sci.)* 106 (1994) 1329.
22. R. Jayakumar, R.G. Jeevan, A.B. Mandal and P.T. Manoharan, "Aggregation, hydrogen bonding and thermodynamic studies on BOC- Val-Val-Ile-OMe tripeptide Micelles in chloroform", *J.Chem. Soc. Farady Trans.*, 90 (1994) 2725.
23. R.Darshan, N.K. Vaish, K. Shah, G.V.R. Chandramouli, B. Vargheese, R. Muthukumaran and P.T. Manoharan, "The copper (II) promoted supramolecular self-assembly of core oxalo retrolispeptides: Crystal structures and magnetic properties of [Aib-COCO-Aib]Cu₂, *J. Amer. Chem. Soc.*, 117 (1995) 1643.
24. P.K. Mandal and P.T. Manoharan, "A comprehensive study of exchange coupling in a macrocyclic binuclear copper (II) complex in solid and solution states", *Inorg. Chem.* 34 (1995)270.
25. R. Sreekumar, R.B.C. Pillai and C.N. Pillai, "Reductive amination of carbonyl compounds via periodate oxidation of N- alkylethanolamine", *Ind. J. Chem.* 33B (1994) 692.
26. U. Kameswari, C.S. Swamy and C.N. Pillai, "Methylation of pyridine over zeolites", *Stud. Surf. Sci. Catal.* 84 (1994)959.
27. T. Kanthimathi, Y.V.S.N. Murthy, C.N. Pillai and S.Subramanian, "Spectral separation of too closely related organic compounds by 1-D TOCSY", *Mag. Res. in Chem.*, 32 (1994)452.
28. C.N. Pillai and M.K. Bhargava, " Rerefined Lubricants" in "Monograph on tribology for design engineers", M.P. Chowdiah and B.V.A. Rao, (eds.) National Research Forum and Institution of Engineers, India, Bangalore (1994).
29. Vasanthi Lakshmanan, K.S. Nagaraja and M.R. Udupa, "Synthesis and characterization of Cu(I) tetrathiomolybdates", *Ind. J.Chem.* 33A (1994).
30. K. Suba, O.G. Singh, B.D. Padalia, Om Prakash, D.Chandrasekaran and M.R. Udupa, "On the substitution of lithium in copper oxides", *Mat. Res. Bull.*, 29 (1994) 443.
31. U.S. Shoba and M.R. Udupa, "thermal decomposition of potassium bromate in the presence of chromium (III) oxide", *thermochemica Acta*, 242 (1994) 215.
32. D.V. Ramana and E. Kantharaj, "Facile synthesis of 2-alkyl-3- aryl-4 (3H)-quinazolinones", *Ind. J. Hetrocycl. Chem.* 3 (1994) 215.
33. D.V. Ramana and E. Kantharaj, "Mass spectrometer as a probe in the synthesis of 2-substituted benz-imidazoles", *Tet.* 50 (1994) 2488.

34. D.V. Ramana and M.S. Sudha, "gas phase cyclizations and thio Claisen rearrangement in the molecular ions of phenyl allenyl sulohides and phenyl propargyl sulphides", *Sulphur Letters*, 17 (1994) 153.
35. K. SriVidya, P.V. Lalitha and R. Ramaswamy, "BZ reaction involving substituted aromatic aldehydes in mixed media", *Tran. SAEST*, 29 (1994) 12.
36. V. Jayalakshmi and R. Ramaswamy, "Current and potential oscillations in BZ systems", *Bull. Electrochem.*, March 1995.
37. P.V. Lalitha, N. Balasubramanian and R. Ramaswamy, "Study of Briggs-Rauscher oscillatory reactions in aqueous acetonitrile mixed medium", *Collect. Czech. Chem. Commun.*, 59 (1994) 1506.
38. G. Maya, P.V. Lalitha and R. Ramaswamy, "The oscillatory BZ reaction with flavones in batch systems using aqueous DMF mixed medium", *Can. J. Chem.*, 72 (1994) 1537.
39. P.V. Lalitha, Geetha Ramakrishnan and R. Ramaswamy, "Study of BZ oscillators in water-acetonitrile medium employing EMF and EPR techniques with ortho vanillin, p-vanillin and adrenaline as substrates", *Spectrochem. Acta*, 50A (1994) 2345.
40. V. Jayalakshmi and R. Ramaswamy, "Reply to comments: on the action of organic solvents in the new BZ oscillator in aqueous organic mixed media by Zhanbotte", *Int. J. Chem. Kin.*, 27 (1995) 197.
41. V. Geetha Saraswathy and S. Sankararaman, "Chemo selective protection of aldehydes as dithio acetals in lithium perchlorate - diethyl ether medium. Evidence for the formation of oxo carbenium ion intermediate from acetals", *J. Org. Chem.*, 59 (1994) 4665.
42. N. Rajesh and M.S. Subramanian, "Extractive separation and determination of Indium and thallium by liquid scintillation counting", *Analyst*, 119 (1994) 2071.
43. A. Ramesh, M.S. Subramanian and T.V. Ramakrishna, "Chemical amplification by spectropotometry for the determination of selenium", *Bull. Chem. Soc. (Jpn)*, (1994) 1.
44. A. Ramesh, Raghuraman, M.S. Subramanian and T. V. Ramakrishna, "Sub-stoichiometric isotope dilution analysis for the determination of Selenium by liquid scintillation counting", *Analyst*, 119 (1994) 2069.
45. D. Sandhya and M.S. Subramanian, "Thio picolino anisilamide as a new analytical reagent for the determination of mercury", *Radiochemica Acta*, 65 (1994) 105.
46. T. Mohan, C.J. Thomas, M.N.S. Rao, G. Aravamudan, A. Meetsma and J.V. van de Grampel, "Reactions of S₄N₄ with (2- pyridylamino) phosphines", *Heteroatom Chemistry*, 5 (1994) 119.
47. G. Sundararajan, "Metathetical Polymerization- A review", *J.Sci. Ind. Res.*, 53 (1994) 418.
48. B. Gita and G. Sundararajan, "Vinylidene Complexes in Organic Synthesis", *J. Ind. Inst. Sci.* 74 (1994) 355.
49. B. Gita and G. Sundararajan, "Synthetic and mechanistic studies in block copolymerisation of phenylacetylenes and norbornene by W(CO)₆ via photoinitiation", *Am. Chem. Soc. Polym. Prep.* 35 (1994) 729.
50. T.A. Vijayaraj and G. Sundararajan, "Novel acceptor promote electron transfer catalysis for metathesis polymerisation of phenylacetylenes", *Am. Chem. Soc. Polym. Prep.* 35 (1994) 858.

51. G. Sundararajan, "Polymers for non)linear)optics", proceedings of the Fourth NOST conference, Dehra Dun (1994) 89.
52. S. Kannan and C.S. Swamy, "Catalytic decomposition of N₂O on in situ generated thermally calcined hydrotalcites", Applied Catalysis, 3B (1994) 109.
53. I.A.P.S. Murthy and C.S. Swamy, "Catalytic decomposition of 2- propanols on Co_{1-x}Al_{2-x}O₄ spinel systems", Catalysis Lettres, 27 (1994) 103.
54. R. Valarivan, C.N. Pillai and C.S. Swamy, "Catalytic behaviour of magnesium - copper intermetallic compound", React. Kin. Catal. Lett. 53 (1994) 419.
55. R. Valarivan, C.N. Pillai and C.S. Swamy, "Decomposition of 2-propanol on an ontermetallic compound for hydrogen storage", React. Kin. Catal. Lett. 53 (1994) 429.
56. S. Velu and C.S. Swamy, "Alkylation of phenol with methanol over magnesium aluminium calcined hydrotalcites", Appl. Catal.119A (1994) 241.
57. S. Kannan and C.S. Swamy, "Preparation and characterization of cobalt containing layered double hydroxides", Sixth Intern. Symp. Sci. basis for Prep. of Het. Catal., Belgium, Preprints 3 (1994) 127.
58. T. Chandiran and S. Vancheesan, J. Mol. Catal., 88, (1994) 31.
59. T. Chandiran and S. Vancheesan, Proc. Ind. Acad. Sci.(Chemical Sci.) 106 (1994) 5.
60. S. Dhanalekshmi, K.K. Balasubramanian and C.S.Venkatachalam,"Anodic oxidation of aryl propargyl and aryl- allyl ethers at a Platinum electrode", Tet. 50 (1994) 6387.
61. R. Pragasam, V.R.K. Murthy, B. Viswanathan and J. Shobanadri, "Measurement of transition temperature simultaneously at DC and micro)wave frequencies on high TCCcDD superconducting systems", Phys. Stat. Sol. A 142 (1994) 465.
62. K.T. Ranjit, R. Krishnamoorthy and B. Viswanathan, "Photocatalytic reduction of nitrite and nitrate on Zn S", J.Photochem. Photobiol. A Chem. 81 (1994) 55.
63. B. Rufus, V. Ramakrishnan, B. Viswanathan and J.C. Kuriacose, "Surface analysis of Rh/CdS", J. Mat. Sci. Lett. 14 (1994) 15.
64. T.K.K. Srinivasan, T. Devanathan and B. Viswanathan, "UPS and molecular orbital calculation studies on bromate anions", Ind.J. Chem. 33A (1994) 889.
65. N.S. Raman, B. Viswanathan, T.K. Varadarajan, M. Subramanian and A.R. Prasad, "Catalytic properties of YBa₂Cu₃O₇- and alkaline earth cuprates", Ind. J. Chem. 33A (1994) 187.
66. N.S. Raman and B. Viswanathan, "Effect of substitution at the barium site in YBa₂Cu₃O₇-, Bull. mat. Sci. 16 (1994) 381.
67. Prince C. Korah and B. Viswanathan, "Acidity of HY-zeolite catalysts - Catalytic titrimetry by isopropyl alcohol; dehydration", Ind. J. chem. 33A (1994) 380.
68. B. Viswanathan, R.P. Viswanath and U.D. Mary, "XPS investigations of metallized Titania", Ind. J. Engg. and mat. Sci. 1 (1994) 335.
69. B. Viswanath, R.P. Viswanath and U.D. Mary, "Photocatalytic activity of metallized Titania systems", Ind. J. Chem. 34A (1995) 510.

70. Alex C. Pulikkottil, R. Vetrivel and B. Viswanathan, "Theoretical studies on topography and acid properties of phosphorous containing ZSM5", *Ind. J. Chem.* 33A (1994) 609.
71. B. Viswanathan, "Homogeneous hydrogenation" book review, *Ind. J. Chem.* 34A, (1995) 164.
72. B. Viswanathan, "Selectivity in Catalysis", book review, *Bull Electrochem.*, Aug. 1994.
73. R.P. Viswanath, V. Sudharsan and A.T. Seshadri, "Dielectric and thermo electric studies on Ti₂ based materials", *Ferroelectrics*, 156 (1994) 49.
74. R.P. Viswanath and A.T. Seshadri, "The ferroelectric characteristics in Fe-Ti-O systems", *Solid State Commun.*, 92 (1994) 831.

4.5 Civil Engineering Department

4.5.1 Introduction

The Department of Civil Engineering was established in the year 1959.

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

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

There is extensive interaction between the faculty and industries belonging to both public and private sectors. The Department has been leading at the institute level in the earnings through industrial consultancy projects. There is also growing emphasis on sponsored research projects and the faculty members are actively involved in several research projects funded by international collaboration schemes and national agencies.

4.5.2 New Courses Introduced

A new M.Tech (Civil) programme with Environmental Engineering specialisation has been introduced for sponsored candidates from July 1994.

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

S.No.	Course No.	Title	Faculty
1.	CE 660	Geotechnics of Coastal Structures	Dr. S.R.Gandhi
2.	CE 793	Computational Geomechanics	Dr. K. Rajagopal

4.5.3 Details of Faculty

Name and qualifications

Major area Specialisation

Professors

H.Achyutha Ph.D.(IIT Madras)	Structural Engineering
P.K.Aravindan Ph.D.(IIT Madras)	Structural Engineering
K.Elango Ph.D.(IIT Madras)	Hydraulic & Water Resources Engg.
V.Kalyanaraman Ph.D(Cornell)	Structural Engineering

Name and qualifications

C.S.Krishnamoorthy Ph.D.(London)
 N.R.Krishnaswamy (Ph.D. IIT Kanpur)
 Nainan P.Kurian Ph.D.(IIT Madras)
 V.Paramasivam Ph.D.(IIT Madras)
 N.Rajagopalan Dr.-Ing(Stuttgart)[Head]
 H.Raman Ph.D.(IIT Madras)
 P.Srinivasa Rao Dr.-Ing(Muenchen)
 H.Suresh Rao Ph.D.(IIT Madras)

Visiting Professors

R.Jayaraman Ph.D.(IIT Madras)
 R.Pitchai Ph.D.(Harvard)
 Shan Somayaji Ph.D.(Illinois)

Associate Professors

M.S.Mathews Ph.D.(IIT Madras)
 V.R.Rengaraju Ph.D.(IISc Bangalore)
 B.S.Thandaveswara Ph.D.(IISc Bangalore)

Assistant Professors

R.Ambalavanan Ph.D.(IIT Madras)
 A.Boominathan Ph.D.(USSR)
 S.R.Gandhi Ph.D.(IIT Madras)
 K.Gopalakrishna M.Tech(IIT Kanpur)
 A.Meher Prasad Ph.D.(Rice Houston)
 S.Mohan Ph.D.(IISc Bangalore)
 S.B.Pattnaik Ph.D.(IIT Kanpur)
 K.Rajagopal Ph.D.(Florida)
 S.Rajeev Ph.D. (IIT Madras)
 A.Ramachandraiah Ph.D.(IIT Madras)
 K.Srinivasan Ph.D.(IIT Madras)
 V.Tamizh Arasan Ph.D.(IIT Madras)
 K.Ramamurthy Ph.D.(IIT Madras)
 K.N.Satyanarayana Ph.D.(Clemson)

Lecturer

Koshy Varghese Ph.D.(Texas Austin)

Senior Scientific Officers

K.Ananthanarayanan M.E.(Madras)
 M.Subbi Reddy M.S.(IIT Madras)
 K.D.Chandrasekaran SSO I Ph.D (IIT Madras)

Technical Officers

P.R.Kothandaraman (S G)
 M.Innaci
 K.Bhaskaran
 V.Raman

Major area Specialisation

Structural Engineering
 Geotechnical Engineering
 Geotechnical Engineering
 Structural Engineering
 Structural Engineering
 Hydraulic & Water Resources Engg.
 Structural Engineering
 Hydraulic & Water Resources Engg.

Hydraulic & Water Resources Engg.
 Environmental Engineering
 Building Tech.& Constrn. Management

Building Tech.& Constrn. Management
 Transportation Engineering
 Hydraulic & Water Resources Engg.

Building Tech.& Constrn. Management
 Geotechnical Engineering
 Geotechnical Engineering
 Environmental Engineering
 Structural Engineering
 Hydraulic & Water Res. Engg.
 Transportation Engineering
 Geotechnical Engineering
 Structural Engineering
 Building Tech.& Constrn. Management
 Hydraulic & Water Res. Engineering
 Transportation Engineering
 Building Tech.& Constrn. Management
 Building Tech.& Constrn. Management

Building Tech. & Constrn. Management

Building Tech.& Constrn. Management
 Transportation Engineering
 Geotechnical Engineering

4.5.4 Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D.	5	1	7	-	10	-	1	1	11	-	34	2	36
M.S.	8	1	7	2	5	-	-	-	-	-	20	3	23
M.Tech.	38	7	25	2	-	-	-	-	-	-	63	9	72
B.Tech.	44	4	49	4	36	3	34	5	-	-	163	16	179
Total	95	13	88	8	51	3	35	6	11	-	280	30	310

4.5.5 Number of Scholarships/Fellowship

Programme	Institute Scholarship	Others	Total
Ph.D	18	-	18
M.S.	16	-	16
M.Tech	55	7	62
Total	89	7	96

4.5.6 Number of Degrees Awarded

Programme	No. Awarded
Ph.D	5
M.S.	7
M.Tech	35
B.Tech	26
Total	73

4.5.7 Instruments/Equipments Designed and Developed (Including Software)

Bond Wrench test equipment for determination of flexural bond strength of masonry prisms for BT & CM division.

Flexural strength tests frame for masonry walls for BT & CM division.

Rotating biological contactors: A partly submerged aerobic attached growth system for the feasibility studies of treatment of glue industrial wastes.

Anaerobic contact filter for studying the treatment of wastes from Sago inclusions and dairies.

Dr.S.R.Gandhi designed fabricated and tested light cone penetration equipment for quick assessment of soil strength in field upto 5m depth. The instrument is now being used for various consultancy assignments.

Dr.S.Mohan developed an interactive software for genetic algorithm for general purpose optimization in C++ language.

Dr. V.Paramasivam developed experimental facility for testing structural elements under high velocity missile impact.

Dr.V.Paramasivam developed Finite Element Code KANDAM

4.5.8 New Facilities and Major Equipments Procured

Spectrophotometer model CL-27 (Elico) for Environmental Engineering Laboratory

Dissolved oxygen analyser PE - 135 (Elico) for Environmental Engineering Laboratory.

Dr.V.Paramasivam procured PC/AT 486 DX for experimental data acquisition.

4.5.9 Sponsored Projects

S.No.	Title	Period	Funding Agency	Amount (Rs. in lakhs)	Coordinator(s)
1.	Knowledge based expert system for Civil engineering design	5 yrs.	National Science Foundation USA	22.00	Dr.C.S.Krishnamoorthy Dr.V.Kalyanaraman Dr.N.Rajagopalan
2.	Knowledge based expert system for finite element analysis for engineering design	3 yrs.	Dept. of Science & Tech. New Delhi	7.18	Dr.C.S.Krishnamoorthy Dr.K.N.Seetharamu Dr.S.Rajeev
3.	Application of finite element method to structures and components	3 yrs.	MHRD Delhi BMFT Germany	32.00	Dr.V.Paramasivam Dr.H.Achyutha
4.	Ultimate strength of nuclear containments	3 yrs.	Atomic Energy Regulatory Board	12.00	Dr.V.Paramasivam Dr.H.Achyutha
5.	Augmentation on Structural Engg. Laboratory facilities	1yr.	NIOT	50.00	Dr.N.Rajagopalan Dr.A.Meher Prasad
6.	Decision support system in water resource management	3 yrs.	DST	4.5	Dr.H.Raman Dr.S.Mohan
7.	Computer aided simulation study of Tambaraparani river system	2 yrs.	TNPWD	24.00	Dr.H.Raman Dr.K.Elango Dr.S.Mohan
8.	Effectiveness of percolation ponds	4 yrs.	DST	4.08	Dr.K.Elango Dr.S.Mohan
9.	Expert system for optimal water resources management	2 yrs.	Indo-German joint research	2.00	Dr.H.Raman Dr.K.Elango Dr.S.Mohan
10.	Draught & Flood Hazard	4 yrs.	Planning Commission	36.00	Dr.A.Meher Prasad Dr.S.Mohan Dr.R.Jayaraman
11.	Creek hydrology	3 yrs.	NIOT (CODAP Cell)	5.00	Dr.H.Suresh Rao Dr.B.S.Thandaveswara
12.	Numerical modelling of the pollutant load in river system	3 yrs.	INCH	18.75	Dr.H.Suresh Rao Dr.B.S.Thandaveswara
13.	Analysis of layered fibre composite stiffened pannels	6 yrs.	ARDB	3.60	Dr.V.Kalyanaraman

S.No.	Title	Period	Funding Agency	Amount (Rs. in lakhs)	Coordinator(s)
14.	Expert system for computer aided engg. of steel structures	5 yrs.	DST	16.37	Dr.V.Kalyanaraman Dr.S.Rajeev
15.	Instability and nonlinear behaviour of CFC elements and panels	3 yrs.	ARDB	5.21	Dr.V.Kalyanaraman
16.	Geosynthetics in reinforced earth embankments	3 yrs.	DST	9.77	Dr.N.R.Krishnaswamy Dr.K.Rajagopal Dr.S.R.Gandhi Dr.A.Boominathan
17.	Development of advanced level instruction and research facility in Transport systems		MHRD	10.00	Dr.V.R.Rengaraju Dr.V.Tamizh Arasan

4.5.10 Major Consultancy Assignments

S.No.	Title	Organisation	Amount (Rs. in lakhs)	Coordinator(s)
1.	Investigation into the collapse of Electro Stativ Precipitation Structure at 500 MW Super Thermal Power Station at Farakka West Bengal	EMIT Milan Italy	2.60	Dr.P.Srinivasa Rao
2.	Design of new que complex at Tirumala	TTD Tirupati	1.75	Dr.P.Srinivasa Rao
3.	Preparation specifications and explanatory notes for the design of Natural draught HP cooling towers	NTPC New Delhi	2.70	Dr.P.Srinivasa Rao
4.	Optimal Design of Transmission line towers	Tata Consulting Engineers Bombay	9.00	Dr.C.S.Krishnamoorthy Dr.S.Rajeev Dr.V.Kalyanaraman
5.	Software for adaptive 2D FEA and GA for discrete size optimization	Aeronautical Development Agency Bangalore	4.98	Dr.C.S.Krishnamoorthy Dr.S.Rajeev
6.	Behaviour of neoprene rubber bearings	Pioneer Rubber Industries	0.40	Dr.N.Rajagopalan
7.	Study of RP of HT	Special Steels Ltd. Rajratan Wires P.Ltd. GEW Industries BIS Modi Steel Wires Ltd. Indore Wires Ltd.	2.00	Dr.N.Rajagopalan
8.	Stability of structures	Kamar Chemical Ltd.	0.50	Dr.N.Rajagopalan
9.	Design for pile foundation	Directorate of Light House & Light ships	0.50	Dr.N.Rajagopalan

S.No.	Title	Organisation	Amount (Rs.in lakhs)	Coordinator(s)
10.	Verification of preliminary design of stadium at Cochin	Mr.C.R.Narayana Rao Architect	0.10	Dr.N.Rajagopalan
11.	Evaluation of feasibility of PS flat slab	Freyssient prestressed Concrete Co. Ltd.	0.50	Dr.N.Rajagopalan
12.	Quality assurance test	Madras Hard Tools	0.25	Dr.N.Rajagopalan
13.	Scrutiny of Design and dwgs.	MMDA Madras	0.20	Dr.N.Rajagopalan
14.	Effects of split tension on bond of reinforcement with concrete	Atomic Energy Regulatory Board	0.33	Dr.N.Rajagopalan
15.	Analysis of SC status in Cauvery basin	GOVT. of Tamil Nadu	1.00	Dr.H.Raman
16.	Analysis and design of water supply system for Eshidiya project	SPIC-SMO Madras	1.15	Dr.K.Elango Dr.H.Suresh Rao Dr.S.Kumarasamy
17.	Improvements to storm water Nullah within AROCHEM project site Manali	National Aromatics and Petrochemicals	0.40	Dr.K.Elango Dr.B.S.Thandaveswara
18.	Decating water system at RTPP Mudanur	AP State EB	2.00	Dr.V.S.Raju Dr.K.Elango Dr.P.K.Aravindan Dr.S.R.Gandhi
19.	Training of natural drain at Gujarat Cement Plant	ECC L & T Madras	0.50	Dr.V.S.Raju Dr.K.Elango
20.	Design checking construction monitoring of common ETP collection and transmission systems	TALCO & PCB Madras	3.00	Dr.V.S.Raju Dr.K.Elango
21.	Suitability of soil for embankment construction	S.P.Lakshmanan Engg. Contractor	0.05	Dr.Nainan P.Kurian
22.	Geotechnical investigations and advice on foundations	TNEB	0.62	Dr.Nainan P.Kurian Dr.N.R.Krishnaswamy
23.	Quality control tests and interpretation for world bank assisted project	P.Ramankutty Civil Contractor	0.65	Dr.Nainan P.Kurian Dr.N.R.Krishnaswamy
24.	Foundation and structural investigation for feasibility of additional floors	Balmer Lawrie Co.	0.41	Dr.Nainan P.Kurian Dr.M.S.Mathews
25.	Design consultancy Nellore Prawn Culture (NAEL)	Nagarjuna Aqua Exp. Limited	2.00	Dr.H.Suresh Rao Dr.V.S.Raju Dr.B.S.Thandaveswara
26.	Sump model design and testing for lift irrigation project	Kirloskar Brothers Limited	10.20	Dr.H.Suresh Rao Dr.B.S.Thandaveswara
27.	Checking of design for blast loading	DRDO	0.20	Dr.V.Paramasivam

S.No.	Title	Organisation	Amount (Rs.in lakhs)	Coordinator(s)
28.	Behaviour of core loaded sleeved column system	Tube Products of India Limited	4.00	Dr.V.Kalyanaraman
29.	Sleeved column system Phase - III	Tube Products of India Limited	3.00	Dr.V.Kalyanaraman
30.	Development of offshore platform structures using core loaded sleeved column system	Tube Products of India Limited	3.00	Dr. V.Kalyanaraman Dr.A.Mehar Prasad Dr.C.Ganapathy
31.	Testing of weighbridge steel deck	Giri Brothers P.Ltd.	0.10	Dr.V.Kalyanaraman
32.	Design of weighbridge structure	Giri Brothers P.Ltd	0.50	Dr.V.Kalyanaraman
33.	Checking the 240T lifting beam design calculation and drawings	Greaves Ltd.	0.10	Dr.V.Kalyanaraman
34.	Proportion of monthrink grout	Pidilite Industries	0.15	Dr.H.Achyutha
35.	Proportion of elastomeric bearings	Killick Nixon Bombay Heven Corpn. Cochin	0.30	Dr.H.Achyutha
36.	Soil-slope stability analysis for the provision of work services for Naval Refile range at Madukkarai	Garrison Engineer Military Engg. Services	0.48	Dr.N.R.Krishnaswamy Dr.Nainan P.Kurian Dr.A.Boominathan
37.	Analysis interpretation and testing of granite samples akibg test report	Mr.J.Purushotham Consultant Geologist Geophysicist	0.08	Dr.N.R.Krishnaswamy Dr.A.Boominathan Dr.R.Ampalavanan
38.	Soil Investigation and advice on foundations	Tamilnadu Housing Board Anna Nagar Divn. Madras-40.	1.78	Dr.N.R. Krishnaswamy Dr.A. Boominathan Dr.K.Rajagopal
39.	Sub-soil Investigation and recommendation for Ash Dyke at Neyveli	Neyveli Lignite Corporation Limited Neyveli	0.05	Dr.S.R. Gandhi Dr. N.R.Krishnaswamy
40.	Sub-soil Investigation and advice on foundations	Shriram CapitalTrust (P) Ltd. Madras-17	0.58	Dr.N.R.Krishnaswamy A.Boominathan Dr.K. Rajagopal
41.	Soil Investigation for Ash Dyke at Ennore Thermal Power Station	Tamilnadu Electricity Board Madras-2	0.75	Dr.S.R.Gandhi Dr.A.Boominathan Dr.N.R.Krishnaswamy
42.	Design of Ash Bund at Neyveli	Neyveli Lignite Corporation Ltd. Neyveli	0.60	Dr.S.R. Gandhi Dr.K.Rajagopal Dr.N.R.Krishnaswamy
43.	Sub-soil Investigation for the proposed multistoreyed Buildings at the site near the junction of Sardar Patel Road and Mount Road	Shriram Capital Trust (P) Ltd. Madras-17.	0.58	Dr.N.R.Krishnaswamy Dr. A.Boominathan Dr.K. Rajagopal
44.	Soil Investigation at Vilagam Village in Chengalpattu MGR Dist.	Dept. of Hand looms & Textiles Madras-108	0.34	Dr.A.Boominathan Dr.N.R.Krishnaswamy

S.No.	Title	Organisation	Amount (Rs.in lakhs)	Coordinator(s)
45.	Analysis Interpretation & Testing of Granite Samples along with Test Report	Gem Granites Madras-86	0.08	Dr.N.R.Krishnaswamy Dr. A. Boominathan
46.	Measurement of vibration - Piling for MFL Revamp area	Madras Fertilizers Ltd. Madras	0.95	Dr. A. Boominathan Dr.N.R. Krishnaswamy Dr.S.R. Gandhi Dr.Nainan P. Kurian
47.	Dynamic Test on Pile at Hazira	L & T ECC Construction Group Madras	0.20	Dr.A.Boominathan Dr.S.R.Gandhi Dr.V.S.Raju
48.	Design of Hammer Foundation	Pilecon Engrs.(P) Ltd. Madras- 18	0.05	Dr.A.Boominathan
49.	Sub-soil Investigation and Foundation Recommendations for Compost Manure Project	E.I.D.Parry (India) Limited	0.30	Dr.S.R.Gandhi Dr.A.Boominathan
50.	Design of Hammer Foundations	K.S.Venkatraman & Co. Ltd.	0.05	Dr.A.Boominathan
51.	Vibration Problem Due Pile Driving	G.R.Construction (Madras) Pvt.	0.05	Dr.S.R.Gandhi Dr.A.Boominathan
52.	Scruting of design of 3.5 mld sewage treatment plant at Madras Port Trust	Madras Port Trust	0.9	Dr.R.Pitchai Dr.DVS Murthy Dr.S.Kumarasamy Dr.K.Elango
53.	Bituminuous mix design	M.Balaiah Engg Contractor Ongole AP	0.12	Dr.V.R.Rengaraju
54.	Suitability of aggregare for road work	Geo Engineers	0.04	Dr.V.R.Rengaraju
55.	Sand gravel mix design	SP Lakshmanan & Co.	0.08	Dr.V.R.Rengaraju
56.	Bituminuous nux design for resurfacing runway at Port Blair	Chief Engineer Navy Port Blair	0.15	Dr.V.R.Rengaraju Dr.N.Rajagopalan
57.	Bituminuous mix design for strengthening Manali oil Refinery Road	SP Lakshmanan & Co.	0.12	Dr.V.R.Rengaraju
58.	Drainage design and cochin refineries limited	Cochin Refineries Kerala	0.90	Dr.K.Elango Dr.B.S.Thandaveswara Dr.P.K.Aravindan
59.	Calibration and flow analysis of flow meter	Switzer Instrument Ltd Madras	12.00	Dr.B.S.Thandaveswara Dr.K.Srinivasan
60.	TALCO=TNPCB Projects Common effluent treatment plants	TALCO-TNPCB		Dr.K.Ramamurthy Member of IIT team

4.5.11 Honours and Awards

Sl.No.	Name of Faculty	Honours/Awards	Purpose
1.	Dr.P.Srinivasa Rao	Invited by the American Concrete Institute to be a Member of their Committee on Concrete Shell Structures,	
2.	Dr.P.Srinivasa Rao	Invited to be a Member of the Scientific and Advisory Committee of the 4th Intl. Symp. on Natural Draught Cooling towers to be held at Kaiserslautern Germany during 29-31 May 1996,	
3.	Dr.S.Mohan	Certificate of Merit - CBIP New Delhi March 1994,	Best Paper
4.	Dr.S.Mohan	Indo-US Fellowship School of Civil & Environmental Engg. Cornell Univ. Ithaca NY Jan.-Dec. 1994	Collaborative Research work
5.	Dr.S.Mohan	Elected as Executive Committee Member of Geographical Committee of Intl. Water Resources Assn.(India) for 3 yrs.,	
6.	Dr.V.Tamizh Arasan	IRC Commendation Certificate - Indian Roads Congress November 1994	Best Paper

4.5.12 DISTINGUISHED VISITORS TO THE DEPARTMENT

Sl.No.	Name of the Visitor and occupation
1.	Prof. Pritz Wensel Prof. of Architecture, Karlsruhe, Univ. Germany visited BT & CM Division
2.	Prof.T.Viraraghavan Regional Environmental Systems Engg. Univ. of Regina Regina Canada visited BT & CM Division
3.	Prof.Kumar Ganesan Montana College of Mineral Science & Technology, Butte Montova USA visited BT & CM Division
4.	Dr.Ely. A.R.Ovano Asian Development Bank Manila Philippines visited BT & CM Division
5.	Mr.S.Banerjee, Seattle University USA, visited Geotech Engg. Division
6.	Dr.K.Vairavamurthy, South Bank University London, visited Hyd. & Water Resources Division
7.	Dr.G.Rouve, RWTH Aachen, Germany, visited Hyd. & Water Resources Division
8.	Prof.Groenvel and Prof.K.D.Angremont T.U. Delft, Netherlands, visited Hyd. & Water Resources Division
9.	Dr.S.M. Seth, Director National Institute of Hydrology, Roorkee, visited Hyd. & Water Resources Division
10.	Dr. R.Jayakumar Head, Water Resources & Environmental Engg., REC Warangal, visited Hyd. & Water Resources Division
11.	UNDP Team visited Hyd. & Water Resources Division
12.	Mr.D.Koschmieder, Scientist Research Centre, Juelich Germany, visited Structural Engg. Division
13.	Dr.A.Kleine-Tebbe Project Leader Vibration Testing Facility, MAVISI, German Aerospace Research Institute, Juelich
14.	Univ. Prof. Monfred Wermuth Head, Institut fur Stadtbauwesen Technische Universitat Braunschweig Germany, visited Transportation Engg. Division

4.5.13 Visits of Faculty Members to other Institutions

Sl.No.	Name of Faculty	Institution Visited	Purpose and period
1.	Dr.P.Srinivasa Rao	Ferguson Laboratory Univ. of Texas Austin	May 1994
2.	Dr.P.Srinivasa Rao	Dept. of Civil Engg. Univ. of Texas Arlington	May 1994
3.	Dr.H.Raman	Madras Institute of Developmental Studies	To Deliver lecture on 2.2.1995
4.	Dr.N.Rajagopalan	Anna Institute of Management REC Trichy	To deliver lecture
5.	Dr.K.Elango Dr.R.Jayaraman	NHM project work National Remote Sensing Agency Central Dry Land Research Instt. National Inst. for Rural Development Water and Land Management Trg. & Research Instt. National Geophysical Research Instt. All at Hyderabad	NHM project work
6.	Dr.B.S.Thandaveswara & Dr K Srinivasan	CWC New Delhi Univ. of Roorkee NIH Roorkee APSARC Hyderabad NRSA Hyderabad NIAR Hyderabad CE Irrigation Dept. AP APS E.B. A.P. IIT Bombay CWPRS Pune Indian Inst. of Tropical Meterology	NHM Project (FloodGroup) work
7.	Dr.S.Mohan	School of Civil & Envrn. Engg. Cornell Univ. Ithaca NY USA, Intl. School of Water Resources Colorado State Univ. Fort Collnis CO USA, Dept. of Land Air and Water Resources & Dept. of Civil Engg. Univ. of California Davis, Hydrologin Engg. Centre US Army Corps of Engineers Davis California	Indo-US Fellowship Jan. Dec. 1994
8.	Dr.V.Paramsivam	Research Centre Juelich Germany	Indo-German Project May - August 1994
9.	Dr.V.Tamizh Arasan	Institut fur Stadtbauwesen Technische Universitat Braunschweig Germany	Indo-German project 9.5.94 to 5.8.94
10.	Mr.K.Gopalakrishna	Bank Note Press Dewas M.P.	Member Expert Committee

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

S.No.	Coordinator(s)	Title of Course/Workshop Seminar/Symposium/Conference	Period
1.	Dr.S.R.Gandhi	Seminar on Design of Pile Cap and Pile Group	2.7.1994
2.	Dr.K.Rajagopal	CEP & QIP on Geosynthetic Reinforced Soil Structures: Design and Construction	3 - 11th Dec. 1994
3.	Dr.V.Paramasivam	STC on FEM in Engg. Analysis	5 - 16th Dec. 1994
4.	Dr.V.Paramasivam Dr.A.Mehar Prasad	WS on Vibration Testing Facilities	27 - 28 Mar. 1995
5.	Dr.V.Tamizh Arasan Dr.V.R.Rengaraju	CEP on Transportation system planning: Methods and Analysis	20 - 23Feb. 1995
6.	Dr.K.Ramamurthy	ISTE-CEP STC on Planning and Design of Building Services	20.6.94 to1.7.94
		QIP-CEP course on Design and construction of structural masonry	12 - 17Dec. 94
7.	Dr.B.S.Thandaveswara	Inter-Institutional STC on Coastal zone management	23 - 28 Jan. 95
8.	Dr.B.S.Thandaveswara	Inter-Institutional WS on Coastal zone management	30 - 31 Jan. 95

4.5.15 Participation in Seminars/Conferences/Symposia

S.No.	Name of Faculty	Title	Date	Nature of participation
1.	Dr.P.SrinivasaRao	Intl. Sym. on Spatial lattice and tension structures Atlanta USA	24-28 April 1994	Presented a Paper
2.	Dr.P.SrinivasaRao	WS on Engg. of structures for mitigating due to cyclones SERC Madras	4-6th Jan.95	Participant
3.	Dr.P.Srinivasa Rao	IX Intl. Conf. on Wind Engineering	9 - 13 Jan.95	Presented a paper Reviewed 10 papers Co-chaired a session
4.	Dr.P.SrinivasaRao	Ntl. WS on Revision of IS:456 1978 Indian Concrete Institute Bangalore	27 -28 Jan. 95	Presented Keynote address
5.	Dr.R.Pitchai	Ntl. WS on Carrying capacity studies Bihar State Polln. Control Board Patna	5th March 1994	Invited speaker
6.	Dr.R.Pitchai	Ntl. Sem. on Environmental Engg. TTTI & WPT Madras	3 - 4 March 1994	Invited speaker

S.No.	Name of Faculty	Title	Date	Nature of participation
7.	Dr.R.Pitchai	Sem. on Science & Technology Edn. in the 21st Century COSTED	12th Nov. 1994	Invited speaker
8.	Dr.K.Rajagopal	II Intl. WS on Geotextiles CBIP New Delhi	11 - 12 Jan.1994	
9.	Dr.K.Rajagopal	II Annl. Conf.of Indian Society of Indstl.and App.Maths. Anna Univ.	23 Feb. 1994	
10.	Dr.K.Rajagopal	Ntl. WS on Num. and Analytical Methods in Geo-technical Engg.IIT New Delhi	19 - 21Dec. 1994,	
11.	Dr.B.S.Thandaveswara	Ntl. Symp. on Recent trends in design of hydraulicstructure NASORT-DHS-94	18 - 19 Mar. 1994,	
12.	Dr.S.Mohan	All India Seminar on Ground Water Potential: Assess-ment Developmentand Management Tirupathi	9 - 10 March 95	Presented a paper
13.	Dr.V.Tamizh Arasan	Ntl. Sem. on Energing trends in Highway Engg. Bangalore Univ. Bangalore	10 - 11 Mar. 1995	
14.	Dr.K.N.Satyanarayana	Ntl. WS on Cost reduction in construction	24 - 25 March 1995	Presented a paper
15.	Dr.N.Rajagopalan	Ntl. WS on Cost reduction in construction	24 - 25 March 1995	Presented a paper
		Ntl. WS on Revision of IS 456 1978 Bangalore	27 - 28 Jan. 95	Presented a paper
		Ntl. WS on Revision of IS 456 1978 Madras	24 - 25 Jan. 95	Presented a paper

4.5.16 List of Publications

Journals

1. P.Srinivasa Rao and S.Duraiswamy, "Non-linear behaviour of North light reinforced concrete shells", Intl. Symp. on Spatial Lattice and tension structures, 24-28th 1994, Atlanta USA.
2. K.Ramanjaneyulu and P.Srinivasa Rao, "Wind buckling of natural draught cooling tower sheels", IX Intl. Conf. on Wind Engineering, Jan. 1995, New Delhi.

3. P.Srinivasa Rao and Devados Menon, "Uncertainties in codal recommendations for across-wind load analysis of RC chimneys" IX Intl.
4. Devadas Menon and P.Srinivasa Rao, Review of mean wind speed profiles in IS:875-1987", Annual paper meeting of the Civil Engineering Division, Institution of Engineers, India, January 1995, Bombay.
5. S.Karimulla Raja, C.S.Krishnamoorthy, and S.Rajeev, Programming Environment for Computer Aided Design on Micro Computers, Jl. of Institution of Engineers, India, Vol.75,p.1.7,1994.
6. G.Ramesh and C.S.Krishnamoorthy, Post-buckling Analysis of Large Truss Structures by Dynamic Relaxation, Journal of Structural Engineering, SERC, Madras,Vol.21, No.2, p.129-136 1994.
7. G.Narayanan and C.S.Krishnamoorthy, Investigations on Truss Element Models for Response of Geometrically Nonlinear Structural Analysis, Journal of Structural Engineering, SERC, Madras, Vol.21,No.2, p.145-163, 1994.
8. H.Achyutha, S.Injaganeri, S.Satyanarayanan and C.S.Krishnamoorthy, C.S., Inelastic behaviour of brick infilled reinforced concrete frames, Jl. of Structural Engineering, SERC, Madras, July 1994. Vol.21,No.2, p.107-115
9. G.Ramesh and C.S.Krishnamoorthy, Inelastic Post-buckling Analysis of Truss Structures by Dynamic-Relaxation Method, International Journal for Numerical Methods in Engineering, Vol.37, p.3633 - 3657, 1994.
10. H.Shivakumar, S.Suresh, C.S.Krishnamoorthy, S.J.Fenves and S.Rajeev, GENCRIT: A Tool for Knowledge-based Critiques in Engineering Design, International Journal on Artificial Intelligence for Engineering Design, Analysis and Manufacturing, Vol.8, p.239- 259, 1994.
11. N.Rajagopaln, Optimal Design and Prestressed Concreted Composite Girders", Jl. of Structural Engg. Vol.21, No.3, Oct. 1994.
12. N.Rajagopaln, "Finite Element modelling for concrete structures", Bulletin of Indian concrete Institute, Jan.- Mar. 1995.
13. J.Letha and K.Elango, "Simulation of mildly unsaturated flow" Jl. of Hydrology, Vol.154, No.1, Jan.1994, pp.1-17.
14. S.Mohan, H.Raman, K.Elango and Subbarayulu, "Optimal parameter estimation for flood simulation model", New Irrigation Era, Madras Vol.14, No.2 April 1994.
14. V.Paramasivam and D.Muthaiah Raj, "Shear-deformable axisymmetric conical shell element with 6 dof and convergence of $O(h^4)$ ", Computer methods in Applied Mechanics and Engineering", Vol.113, 1994, pp.47-54.
15. V.Paramasivam, H.Achyutha and K.Radhakrishna, "A review of experimental investigations on blast resistance of structures", Indian Concrete Jl. Vol.68, No.5, May 94, pp.267-273.
16. D.M.Raj, R.Narayanan, A.G.Khadakkar and V.Paramasivam, "Effect of ring stiffness on vibration of cylindrical and conical shell models", Jl. of Sound and Vibration, Vol.179(3), 1995, pp.413-426.
17. Asimkar and H.Suresh Rao, "One dimensional distributed flow routing in channels by finite elements method", Jl. of Institution of Engineers (India) Vol.75, pp.102-106, Aug.94.
18. H.Suresh Rao and Prince Arul Raj, "A discussion on paper titled 'Modeling pipe networks dominated by junctions", ASCE, Dec.1994, pp.89-92.

19. C. M. Madaswamy and V. Kalyanaraman, "Analysis of Plated Structures with Rectangular Cutouts and Internal Supports Using Finite Strip Method" *Jl. of Computers and Structures*, V.42 N2, 1994, pp.277-286.
20. C. M. Madaswamy and V. Kalyanaraman, "Static Stability and Free Vibration Analysis of Stiffened Plates by B3 Spline Finite Strip Method", the *Jl. of Aeronautical Society of India*, Feb 1994, pp.1-10.
21. A.C. Djugash and V. Kalyanaraman, "Non-Linear Analysis of Thin walled Members under Biaxial Bending" *Jl. of Constructional steel Research*, Vol.31, N 2-3, 1994, pp.289-304.
22. N.R. Krishnaswamy and N. Thomas Isaac, "Liquefaction Potential of Reinforced Sand", *Jl. of Geotextiles and Geomembranes*, Vol.13, Jan., 1994 pp. 23-41, Published by Elsevier Science Limited, England.
23. N.R. Krishnaswamy and S.P. Parashar, "Uplift Behaviour of Plate Anchor with Geosynthetics", *Jl. of Geotextiles and Geomembranes*, Vol. 13, pp 67-89, Published by Elsevier Science Limited, England, 1994.
24. V.Thamizh Arasan, V.R.Rengaraju and K.V.Krishna Rao, "Characteristics of trips by foot and bicycle modes in Indian city", *Jl.of Transportation Engg., ASCE*, Vol.120, No.2, Mar/April 1994, pp.283-204.
25. V.R.Rengaraju and M.Satyakumar, "Structuring catagory analysis using statistical techniques", *Jl. of Transportation Engg. ASCE*, Vol.120, No.6, Nov./Dec 1994 pp.930-939.
26. S.B.Pattnaik, "Recent trends in transportation systems planning", *Jl. of Civil Engg. and Construction Review*, New Delhi, Vol.7, No.9, Oct.1994, pp.49-53.
27. S.Somayaji, A.M.Prasad, M.S.Mathews and C.S.Krishnamoorthy "Types of Building Failures due to Cyclonic Winds" Ninth International Conference on Wind Engineering, New Delhi, India, 9-13 Jan 1995 Volume IV pp 1979-1988
28. A.Verma, A.M.Prasad and V.Kalyanaraman, "Non-linear Analysis and Optimal Design of Guyed Towers with a Given Configuration", Ninth International Conference on Wind Engineering, New Delhi, India 9-13 Jan 1995, Vol.III PP.1479-1489
29. K.V.Krishna Rao, V.Tamizh Arasan and Dr.V.R.Rengaraju, "Mode choice analysis: A Review", *Indian Jl. of Transport Management*, Vol.18, No.11, pp.701-712.
30. K.Ramamurthy and P.Kalyanasundaram, "Computer aided planning and design of passenger elevator system in multistorey buildings", *Institution of Engineers (India), Arch. Engg. Division*, Vol.74, March 1994, pp.55-61.
31. K.Ramamurthy and G.Rajasekhar, "Design provisions for laterally loaded concrete brick/block masonry", *The Indian Concrete Journal*, Vol.68, No.12, Dec. 1994, pp.719-722.
32. K.Ramamurthy, "Literature survey: A search for literature". *The Indian Jl. of Technical Education*, *Indian Society for Technical Education*, Vol.17, No.3, July-Sept. 1994, pp.20-25.
33. V.Ganesan, R.Srinivasan, S.A.Sarathy, K.D.Chandrasekaran, B.Srinivas, V.V.Varadaraja, GV. Subba Rao, R.Gopalan and T.Rajasekar, "Magnetic sheilding using high temperature superconductors", *Bull. Mater. Science* 17(1) Feb. 1994, pp.87-93.
34. K Gopalakrishna, one chapter on "Optimized optimal systems for collection and transport of urban wastes" in the book *Environmental Pollution Control*, Ed. M.R.Garg et al, 1995.

35. G.Narasimha Rao and S.R.Gandhi, "Parametric study on pile drivability - selection of hammer and other components", The Institution of Engineers (India) Civil Engineering Division.
36. S.Mohan and N.Arumugam, "Crop coefficients of major crops in south India", Agricultural Water Management, Elsevier Press, Vol.26, No. 1 & 2, 1994, pp.67-80.
37. S.Mohan and N.Arumugam. "CROPES: A rule-based expert system for crop selections in India, Trans of American Society of Agricultural Engineers, USA, Vo.34, No.4, 1994, pp.1355-1363.
38. S.Mohan and N.Arumugam, "Irrigation crop coefficients for lowland rice", Irrigation and Drainage Systems, Vol.8, No.4, 1994. pp.159-176.
39. N.Arumugam and S.Mohan, "Discussion on irrigation land management model", Irrigation and drainage engineering division, ASCE, Vol.121, No.1, 1995, pp.1-12.
40. S.Mohan and S.Vedula, "Multiplicative seasonal ARIMA model for longterm forecasting of inflows", Water Resources Management, Vol.9, 1995, pp.1-12.
41. S.Mohan, Fuzzy linear programming model for water resources allocation", Jl. of Indian Water Works Association, Vol.26, No.3, 1994, pp.155-158.
42. H.Raman, K.Elango, S.Mohan and M.Venkateswara Rao, "Stochastic analysis of droughts in Adyar river basin", Jl. of Indian Water Resources Society, Vol.13, No,3/4, 1994, pp.192-197.
43. K.Srinivasan and B.S.Thandaveswara, "Stochastic Modelling of Monsoon dependent flows of south Indian rivers", Jl. of Institute of Engineers, India, Vol.75, Feb.1995, pp.220-227.
44. K.Srinivasan and M.C.Philipose, "Storage-reliability yield relationship for Hemavathy reservoir, Jl. of Indian Water Works Association, Jan-March, pp.7-11.

Conferences

1. P.Srinivasa Rao and Devadas Menon, "Ultimate strength of tubular RC tower sections under wind loading", The Indian Concrete Journal, Vol.69, No.2, Feb.1995, pp.117-123.
2. H.Raman, S.Mohan and G.Sethuraj, "A knowledge-based decision support system for water distribution management", Proc. IX Intl. Conf. on Application of the Artificial Intelligence in Engineering, Boston, July 1994, pp.157-183.
3. J.Letha and K.Elango, "Simulation of alternate wetting and drying in unsaturated flow zones", Intl. Conf. Computational Methods in Water Resources, Germany, July 1994, pp.73-82.
4. C. Nagaraju Kumar and K.Elango, "Tank model parameter estimation with genetic algorithm", Proc. Ninth Congress, Asian and Pacific Div. of Div of IAHR, Singapore, Aug. 1994, pp.302-309.
5. J.Letha and K.Elango, "Unsaturated soil characteristic: Experiment and analysis", Proc. 59th Annual R & D Session, CBIP, Calcutta, Feb.1994.
6. J.Letha and K.Elango, "Assessment of Hystress in Soils for a typical combined drainage- cum subirrigation system", Ntl. Sem. Water and Environment, Trivandrum, Dec. 1994 pp 1-51 to 1- 62.
7. E.Venkatarathnam and K.Elango, "Transients and protection in a deep wells fed long nain", Proc. 21st Ntl. Conf. FM & FP, Hyderabad, Dec. 1994.
8. N.P.Kurian, "Behaviour of shell foundations under subsidence of core soil" Proc. XIII Intl. Conf. on Soil Mechanics and Foundation Engineering, New Delhi, Vol.2, Jan. 1994, pp,591-594,
9. N.P.Kurian and M.S.Srinivas, "Comparitive behaviour of uniform and tapered piles", III Intl. Conf. on Deep Foundation Practice, Singapore, May 1994.

10. N.P.Kurian and R.S.Jeevan, "Parametric studies on combined hydro shell fatigue", Proc. II. on Computational Methods in Structural and Geotechnical Engineering, Hong Kong, Dec. 1994.
11. H.Suresh Rao, Y.N.Srivastava and V.N.Diwanji. "Model study of an antivortex device at an intake Ninth Congress of the Asia and Pacific Division of International Association for Hydraulic Research, Singapore, August 1994.
12. Y.N.Srivastava, V.N.Diwanji and H.Suresh Rao, "Selection of parameters for hydraulic modelling of free surface vortex", Ntl. Sym. on Recent Trends in Design of Hydraulic Structure, Univ. of Roorkee, March 1994.
13. V.Kalyanaraman, B.N.Sridhara and K.Mahadevan "Sleeved Column Systems" Proceedings of Structural Stability Research Council 50th Anniversary Conference, Lehigh University, Bethlehem, 20 - 22nd June 1994.
14. P.Jayabalan and V. Kalyanaraman "Local Buckling of Stiffened and Unstiffened Elements under Non-Uniform Compression" Proceedings of Twelfth International Specialty Conference on Cold Formed Steel Structures, at the University of Missouri-Rolla, St.Louis, MO USA, October 18-19 1994.
15. V.Kalyanaraman, K. Mahadevan and S.Hariharan "Core Loaded Column System with Thin Walled Sleeves" Proceedings of Twelfth International Specialty Conference on Cold Formed Steel Structures at the University of Missouri-Rolla, St.Louis, MO USA, October 18-19 1994.
16. Ajay Verma, A.Meher Prasad and V.Kalyanaraman, "Non-Linear Analysis and Optimal Design of Guyed Towers with a given Configuration", Proc. Ninth International Conference on Wind Engineering, New Delhi, Jan. 9 - 13, pp.1479-1489.
17. H.Achyutha, "Some comments on IS: 456 - 1978 Code clauses pertaining to concrete grades, concrete mixes and core tests", Proc., Ntl. Workshop on Proposed for revision of IS:456 - 1978, Indian Concrete Institute, Karnataka Local Centre, Bangalore, Jan. 1995, pp.1.28 - 1.32.
18. Rajagopal, K., N.R. Krishnaswamy and N. Unnikrishnan (1994), "Numerical Simulation of Sandwich Mechanism in Reinforced Soil Structures", Proc. of the 2nd Intl. Workshop on Geotextiles, Jan. 11-12, New Delhi, pp. 38-45.
19. N.R. Krishnaswamy (1994), "Investigations on soil-raft-superstructure Interaction " (etudes des interactions Sol-Radier-superstructure), Proc. of the 13th Intl. Conf. on Soil Mechanics and Foundation Engg., January, 5-10, 1994, pp. 583-586.
20. N.R. Krishnaswamy and Athavan, M.A. (1994), "The Application of Theory of Elasticity for the Analysis of Reinforced Earth Beds", Second Annual Conf. of Indian Society of Industrial and Applied Mathematics, Feb. 23-25, Anna Univ., Madras, pp. G1-1 - G1-8.
21. N. Unnikrishnan, N. Rajagopal, and N.R. Krishnaswamy (1994), "Numerical and Mathematical Analysis of Composite Soils", Proc. of the 2nd Annual Conf. of Indian Society of Industrial and Applied Mathematics, Feb. 23-25, Anna Univ., Madras, pp. G2-1 - G2-8.
22. N.R.Krishnaswamy, Unnikrishnan Pillai,P., and Boominathan,A. (1994), "Numerical Modeling of Reinforced Embankment by Equivalent Composite Material Approach", Proc. of the Second Annual Conf. of Indian Society of Industrial and Applied Mathematics, Feb.23-25, Anna Univ., Madras, pp.G4-1 - G4-10.
23. K.R. Lekha, K. Rajagopal and N.R. Krishnaswamy (1994), "Flow of Water Through Soil Media: A Mathematical Simulation", Proc. of the Second Annual Conf. of Indian Society of Industrial and Applied Mathematics, Feb. 23-25, Anna Univ.,

- Suresh P. Parashar and N.R. Krishnaswamy (1990), "A Procedure for Estimation of Uplift Capacity of Plate Anchors with Geosynthesis", Proc. of Geotropica 94, Conference, Uni Teknologi Malaysia, Johr Bahru, Malaysia.
25. Suresh P. Parashar and N.R. Krishnaswamy (1994), "Plate Anchors with Geosynthetics", Proc. of Fifth International Conference on Geotextiles, Geomembranes and Related Products; Singapore, 5-9 September, pp 305-310.
 26. A. Boominathan and N.R. Krishnaswamy (1994), "Analysis of Foundations Subjected to Dynamic Loading", Proc. of the National Workshop on Numerical & Analytical Methods in Geotechnical Engg., IIT, Delhi, 19-21 December, pp II.5.1-II.5.19
 27. R.Jayaraman, "Fuzzy decision making in water resource problems", Ntl. Conf. on Water and Environment, Dec.1994, pp.2.1 - 2.8.
 28. R.Pitchai, "Water quality studies in India", Workshop on carrying capacity studies, Bihar State Pollution Control Board, Patna March 1994, pp.18-29.
 29. R.Pitchai, "Hardy cross and Newton Raphson methods of network balancing", Ref. course on Water supply distribution Network Analysis using computers, Min. of Urban Development CPHEEO, Anna University, Madras, Feb. 1994.
 30. R.Pitchai, "Environmental education, Research and training in India", Ntl. Seminar on Environmental Engineering, Madras March 1994.
 31. B.S.Thandaveswara and K.Syamala, "Impact of aquaculture on ecology", Intl. Sym. on Ecology and Engg., Malaysia, Nov.1994, pp.VII-39 - VII-48.
 32. K.Srinivasan and B.S.Thandaveswara. "Reservoir planning and design - An overview", Ntl. Sym. on Recent Trends in Design of Hydraulic Structure, Univ. of Roorkee, March 1994, pp.199-200.
 33. B.S.Thandaveswara, "Flood damage assessment", Workshop on Cyccone and Flood Hazard Mitigation, June 1994.
 34. K.Gopalakrishna, "Studies on the treatment of dairy wastes - Anaerobic contact filter" Proc. Conf. on Industrial water use and reuse, Pune, June 1994.
 35. K.Gopalakrishna, "Design of clay liner for tannery effluent dump sites" Proc. Ninth Indian Engineering Congress, Calcutta Dec. 1994.
 36. S.R.Gandhi and D.K.Maharaj, "Analysis of pile raft foundation" Proc. One day Sem. on Design of Pile group and Pile cap, Indian Geotechnical Society, Madras Chapter, July 1994, pp.SRG1 - SRG10.
 37. V.Tamizh Arasan and K.Jagadeesh, "Probabilistic Method of Estimation of Delay to Vehicle at Signalised intersections", Proc. Ntl. Sem. on Emerging Trends in Highway Engineering, Bangalore University, March 1995, pp.T5.1 - 5.16.
 38. V.Tamizh Arasan and V.R.Rengaraju, "Statistical analysis of spot speed of urban uncontrolled intersections", Proc. Ntl. Sem. on Emerging Trends in Highway Engineering, Bangalore University, March 1995, pp T8.1 - 8.12.
 39. S.B.Pattnaik and V.M.Tom, "Energy efficient and environment way Engineering, Bangalore University, March 1995, pp. E 1.1 - 1.13.
 40. S.Somayaji, A.M.Prasad, M.S.Mathews and C.S.Krishnamoorthy, "Karaikal Cyclone - Failure of Structures and Life lines"- Seminar on Mitigation and Management of Cyclone and Flood Disaster" Madras, 4, June 1994.

41. A.M.Prasad and K.Bagchi, "Effects of pile Group and Soil Non-linearity on Pile Foundation Systems of Tall Towers", Seminar on "Design of pile Group and Pile Cap" Organised by Indian Geotechnical Society, Madras Chapter 2nd July 1994.
42. K.Srinivasan and M.C.Philipose, "Hedging - when and how much? Proc. of IX Congress of the Indian and Pacific division of the Intl. Assoc. for Hydraulic Research, Aug. 1994, Singapore, pp.56-64.
43. K.Srinivasan and M.C.Philipose, "Streamflow model selection for reservoir performance study", Proc. of 59th R & D session of the CBIP, Calcutta, 1994.
44. K.Rajagopal and R.J.Bathurst, "Parametric finite element investigation of reinforcement soil retaining walls", 6th International Conference on Geotextiles, Geomembranes and Related Products, Singapore, September 1994.
45. K.Rajagopal, "Finite element analysis of reinforced soil retaining walls", Ntl. Workshop on Numerical and Analytical Methods in Geotechnical Engineering, IIT, New Delhi, Dec. 1994.
46. K.Rajagopal, "Design of reinforced soil walls and bridge abutments", Workshop on Engineering with Geosynthetics, Committee for International Geotextile Society(India) and Central Board of Irrigation and Power, Hyderabad, Dec. 1994.
47. S.Shyam Prakash, M.S.Mathews and S.Rajeev, "Optimal Design for Ribbed ferrocement wall elements using genetic algorithms", Proc. 5th Intl. Sym. on Ferrocement, Sep. 1994, Manchester, U.K.
48. G.Rajasekhar and K.Ramamurthy, "Unreinforced concrete hollow block masonry under lateral loading - An economic construction technique", Proc. of the Seminar on Economics and Management of Concrete Construction and Maintenance", ICI IE(I) and MNR Engg.College, Allahabad Feb. 1994, pp.1-34 to 1-42.
49. R.Radhakrishnan and K.Ramamurthy, "Classification of strategies for cost-effectives in construction", Proc. of the Sem. on Low cost housing, Institution of Engineers (I), Nagpur, Oct. 1994.
50. R.Radhakrishnan and K.Ramamurthy, "Cost-effectiveness bearing masonry", Proc. of the 10th Ntl. Con. of Architectural Engineers, Institution of Engineers(I) and REC Calicut, Nov. 1994.
51. K.N.Satyanarayana, "Optimization of construction operations", Ntl. Workshop on Cost Reduction in Construction, Madras, March 1995, pp.108-121.
52. Koshy Varghese, Satyanarayana N.Kalidindi and H.Hemanandhan, "GIS based decision support for managing cyclonic hazards", Intl. Conf. on Remote sensing and GIS (ICORG-84), Hyderabad, Dec. 199, pp.87-91.
53. P.Dharwadkar, K.Varghese, T.Gatton, J.T.O' Connor, "Graphical visualisation for planning heavy lifts", 1st ASCE Congress on Computing in Civil Engineering, June 1994, Washington D.C.
54. K.Ananthanarayanan and Sandeep, "Multi-project multi objective scheduling", All India Seminar on Economics and Management of Concrete Construction and Maintenance, Allahabad, February 1994.
55. H.Raman, S.Mohan and G.Sethuraj, "A knowledge-based decision support system for water distribution management", Proc. Ninth Intl. Conf. on Applications of Artificial Intelligence in Engineering, Pennsylvania, USA, 19-21, 1994, pp.157-163.
56. S.Mohan and N.Arumugam, "Ahybrid expert system for reservoir operation", Proc. Intl. Symp. on Water resources planning in a changing world, Univ. Karlsruhe, Germany, 1994., pp.II.97-II.106.

57. S.Mohan and N.Arumugam, "Efficient water management strategies under limited water supplied", Proc. 17 European Regional Conf. on ICID, Varna, Bulgaria, 1995.
58. V.Jothiprakash, S.Kumaragaur, K.Elango and S.Mohan, "Effectiveness of percolation ponds", Proc. All India Sem. on Groundwater Potential Mar.1995, pp.5-10.
59. M.C.Philipose and K.Srinivasan, "Hedging - When and How much?", Prof. of 9th APD of the Intl. Assn. for Hydraulic Research IAHR, Aug. 1994, Singapore, pp.56-64,
60. B.S.Thandaveswara, "Flood damage assessment", Workshop on Cyclone and flood hazard Mitigation, June 1994.
61. K.Srinivasan and B.S.Thandaveswara, "Reservoir planning and designs - An overview", Ntl.Sym on Recent Trends in Design of Hydraulic Structures, Roorkee, Mar.1994, pp.199-209.

Books

1. C.S.Krishnamoorthy, "Finite Element Analysis - Theory and Programming", II Edition, Tata McGraw Hill Publishers, New Delhi, 1994, p.710.
2. N.P.Kurian, "Design of Foundation Systems - Principles and Practices", II Edition, Narosa Publishing House, New Delhi, 1994, p. xvi + 704.

Reports

Following reports are prepared as part of Technology Development Mission on Natural Hazards Mitigation.

1. "Cyclone and its effects" - A Cyclone Information Manual (First ed.) S.Somayaji and A.M.Prasad, 1994.
2. "Analysis of Wind load Provisions of IS-875 and Building Mathews.M.S. and Krishnamoorthy.C.S. - Tech Report No. NIMC/94/02 July 1994.
3. "A Study of Cyclone shelters in Tamil Nadu and Andhra Pradesh." S.Somayaji, A.M.Prasad, M.S.Mathews and V.Hemalatha, Technical report No.NHMC/94/03, Oct. 1994.
4. "Karaikal cyclone - failure of structures and life lines", S.Somayaaji, A.M.Prasad, M.S.Mathews and C.S.Krishnamoorthy, Seminar on Mitigation and Management of cyclone and flood disasters, June, 1994.

4.5.18 Other Details

Computer Network

- i) The Department has established a computer network by connecting the different computers in three different buildings. The file server housed in BSB, controls the network and the faculty & students of the Department can share the computer resources. The network is already hooked on to the campus network which is in its early stage of development. The network is also connected to internet via ernet, which gives facilities such as e-mail, gtp, and telenet to computers all over the world.
- ii) A set of video cassettes covering the Civil Engineering Laboratory courses at IIT, Madras is under preparation as a Civil Engineering Laboratory Series. These cassettes would be particularly useful to many institutions not endowed with good laboratory facilities.

4.6. Computer Science and Engineering Department

4.6.1. Introduction

Academic programmes in Computer Science and Engineering at the Master's and research level started in 1973 with the installation of the IBM system 370. The department of computer science and engineering was formally started in 1983 and the B.Tech. program was initiated. The department has well equipped laboratories including a network of SUN workstations. Several sponsored projects have helped to create specialized laboratories in the areas of Expert systems, Speech, CAD for VLSI, Computer networks, Information technology, AI, etc.

Areas of Research

The department is actively engaged in the following areas of research in computer science:

Theoretical Computer Science:

Analysis of Algorithms, Automata Theory and Formal Languages, Computational Geometry, Graph Algorithms, Machine Learning, Parallel and Randomized Algorithms.

Networks and Distributed Systems:

Computer Networks, Distributed Systems, Multimedia Systems, Performance Evaluation, Protocol Engineering.

Artificial Intelligence:

Expert Systems, Knowledge Based Systems, Natural Language Processing, Robotics, Distributed Artificial Intelligence.

Computational Intelligence:

Computer Vision, Digital Signal Processing, Neural Networks, Pattern Recognition, Speech Processing, Statistical Signal Processing.

Software Engineering:

CAD/CAM, Database Systems, Distributed Computing, Fault Tolerant Computing, Object Oriented Programming, Operating Systems, Parallel Processing, Programming Languages, Software Quality Assurance, Text and Image Systems.

Computer Systems and Design:

Analog and Digital Systems, Computer Graphics, Digital System Design, Microprocessors, Parallel Architectures, VLSI Design.

4.6.2. New Courses Introduced

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

Sl.No.	Course No.	Title	Faculty
1.	CS788	Multimedia Systems	S.Raman, S.V.Raghavan
2.	CS793	Fault Tolerant Computing	Ravi Mittal

4.6.3. Details of Faculty

Name and Qualification

Major area of Specialization

Professors

R.Kalyanakrishnan, Ph.D.(Univ.of Yale USA)	Computer Architecture
Kamala Krithivasan, Ph.D.(Univ.of Madras)[Head]	Analysis of Algorithms
H.N. Mahabala, Ph.D.(Univ. of Saskatchewan, Canada)	Artificial Intelligence, Expert Systems VLSI Design, Software Engineering
C.R.Muthukrishnan, Ph.D.(IIT Kanpur)	Computer Architecture
B.Yegnanarayana, Ph.D.(IISc)	Computer Vision, Digital Signal Processing, Neural Networks, Speech Processing

Associate Professors

T.A.Gonsalves, Ph.D.(Stanford USA)	Computer Networks, Distributed Systems, Operating Systems, Performance Evaluation
C.Pandu Rangan, Ph.D.(IISc)	Computational Geometry, Graph Algorithms, Machine Learning, Parallel and Randomized algorithms
S.V.Raghavan, Ph.D.(IIT Madras)	Computer Networks

Assistant Professors

Deepak Khemani, Ph.D.(IIT Bombay)	Artificial Intelligence, Knowledge Based Systems, Natural Language Processing, Neural networks
Hema Arunachalam Murthy, Ph.D.(IIT Madras)	Computer Graphics, Digital Signal Processing, Pattern Recognition, Speech Processing
D.Janaki Ram, Ph.D.(IIT Delhi)	Software Engineering, Object Oriented Programming, Distributed Databases, CAD/CAM, Distributed Computing
S.Raman, Ph.D.(IIT Madras)	Digital System Design, Microprocessors, Multimedia Systems
Ravi Mittal, Ph.D.(IIT Delhi)	Computer Networks, Fault Tolerant Computing, Parallel Architectures, VLSI Design
C.Siva Ram Murthy, Ph.D.(IISc)	Parallel Processing, Parallel Algorithms, Software Engineering.
P.Sreenivasa Kumar, Ph.D.(IISc)	Graph Theory and Algorithms, Parallel Computing
Sukhendu Das, Ph.D.(IIT Kharagpur)	Analog and Digital Systems, Computer Graphics

Lecturers

C.Chandrasekhar, M.Tech.(IIT Madras)	Digital Signal Processing, Neural Networks, Speech Signal Processing
G.V.Ramana Rao, Ph.D.(IIT Madras)	Artificial Intelligence, Speech Processing, Natural Language Processing
G.Ravi Prakash, M.Tech.(IIT Kanpur)	Database Systems, Expert Systems, Software Engg.

Name and Qualification

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

Major area of Specialization

Microprocessors, Parallel Processing, Speech Processing

Senior Scientific Officers Gr.II

N.Alwar, M.S.(IIT Madras)

Microprocessors, Digital System Design, Systems Programming

B.Prabhakaran, M.S.(IIT Madras)

Computer Networks, Multimedia Systems

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

Pattern Recognition, Computer Vision

4.6.4. Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D.	2	-	3	-	3	-	5	-	4	-	17	-	17
M.S.	17	3	7	2	7	-	3	-	-	-	31	8	39
M.Tech.	38	6	38	-	-	-	-	-	-	-	76	7	83
B.Tech.	27	-	28	2	25	1	28	2	-	-	108	5	113
Total	84	9	76	5	35	1	36	2	4	-	232	20	252

4.6.5. Number of Scholarship/Fellowship holders

Programme	Institute	Others	Total
Ph.D.	8	3	11
M.S.	26	1	27
M.Tech.	53	-	53
Total	87	4	91

4.6.6. Number of Degrees Awarded

Programme	Number
B.Tech.	26
M.Tech.	36
M.S.	12
Ph.D.	4
Total	78

4.6.7. Instruments/Equipment Designed and Developed

- 2-port local ethernet bridge (EZBridge 1000)
- 2-port remote ethernet bridge (EZBridge R1000)
- CLAM/DOS - networked library automation package
- Mangrove eco-information system
- OSinet experiment series for colleges and universities for teaching computer networks

4.6.8. Short-term Courses/Workshops/Seminars/Symposia/Conferences organized

Sl. No.	Co-ordinator(s)	Title Courses/Workshops Seminars/Symposia/Conferences	Period
1.	B.Yegnanarayana C.Chandra Shekar	Artificial Neural Network	29.4.94 to 5.5.94

4.6.9. Short-term Courses/ Workshops/ Seminars/ Symposia/ Conferences/ Training attended by the Faculty in recognized Academic Institutions and Public Sectors.

Sl.No.	Name of Faculty	Title	Period/Duration
1.	S.Raman	TNSC-III Madras	Dec. 1994
2.	T.A.Gonsalves	Networks-94 Madras	Dec. 1994
3.	C.Chandra Sekhar	ISSIPNN-94 Hong Kong	Apr. 1994
4.	C.Chandra Sekhar	National Conf. on NN & Fuzzy systems, Madras	Mar. 1995
5.	Ravi Mittal	ICPP-94 Chicago, USA	July. 1994
6.	Ravi Mittal	Int. Conf. on Reliability and Quality, Seattle, USA	Mar. 1994
7.	Ravi Mittal	IWPP-94, Bangalore	Dec. 1994

4.6.10. Special Lecture(s) Delivered

Sl.No.	Name of the Faculty	Topic of Lecture	Delivered at	Date
1.	S.Raman	Multimedia Computers	AIR Madras	18.3.94
2.	S.Raman	Multilingual Computers	AIR Madras	18.3.94
3.	T.A.Gonsalves	Communication Networking	IISc, Bangalore	Aug.94
4.	T.A.Gonsalves	Wireless Local Loop for urban Telephony	WPI Massachusetts USA	Oct.94
5.	C.Siva Ram Murthy	Scheduling Parallel Programs for Execution on Multiprocessors	REC Warangal	11.3.94
6.	B.Yegnanarayana	Role of Intonation for Speech System in Indian Languages	Rutgers University	29.6.94
7.	B.Yegnanarayana	New Approaches for Speech Signal Processing - Some Results on Event Band Analysis	IPO Eindhoven, The Netherlands	18.11.94
8.	S.V.Raghavan	Advances in Networking Technology	Pondicherry Univ.	Feb.95
9.	S.V.Raghavan	Tutorial on Internetworking	Int. Conf. on Network Protocol Architecture and Applications	Dec. 94
10.	S.V.Raghavan	Current Research in Multimedia at IIT Madras	ISS, NUS Singapore	Oct.94
11.	S.V.Raghavan	Options for IOBnet for Senior Executives	IOB Madras	Oct.94
12.	S.V.Raghavan	Seamless Integration Resources	Board Members EIL, New Delhi	Oct.94
13.	S.V.Raghavan	Multimedia Systems	CSI Culcutta	Sep.94
14.	S.V.Raghavan	Indian Networking Scenario	Seminar organized by TCS	Jul.94

4.6.11. Visits Abroad

Sl.No.	Name of Faculty	Country visited	Date	Purpose of visit
1.	S.V.Raghavan	UMD USA	May-Jun.94	Visiting Professor
2.	S.V.Raghavan	Grenoble, Franch	Jan. 94	Conference
3.	S.V.Raghavan	NUS, Singapore	Oct.94	Guest Lecture
4.	C.Pandu Rangan	Beijing, China	Aug.94	To Present Papers
5.	C.Chandra Sekhar	Hong Kong	April 94	To Present paper
6.	B.Yegnanarayana	France	9.5.94-5.6.94	-
7.	B.Yegnanarayana	USA	6.6.94-5.7.94	-
8.	B.Yegnanarayana	The Netherlands	15.6.94 to 5.1.95	-
9.	Kamala Krithivasan	Germany	Jun.94	Indo-German Project
10.	Kamala Krithivasan	Singapore	Nov.94	To Present Paper
11..	T.A.Gonsalves	USA	22.10.94-21.11.94	To visit Analog devices
12.	T.A.Gonsalves	USA	23.3.95-2.4.95	To attend Conference
13.	Ravi Mittal	Univ. of Maryland	Jan. 94 to Dec. 94	Visiting Faculty

4.6.12 Distinguished Visitors to the Department (Important dignitaries above the level of Professors)

Sl.No.	Name of the Visitor and Occupation	Date of Visit	Purpose of Visit (Lecture/Discussion)
1.	Mr.Ray Stata, Chairman Analog Devices, USA	1994	Discussion

4.6.13. Sponsored Projects

S.No.	Title(s)	Period	Funding Agency	Amount (In Lakhs)	Co-ordinator(s)
1.	FDDI Station Management Protocols and Ethernet Bridge	1994- 96	DOE	27.20	T.A.Gonsalves A.Jhunjunwala(EE) B.Ramamurthy(EE) C.Mathiazhagan(EE)
2.	Mangrove Eco-system Information Services	1993-94	M.S.Swaminathan Foundation	1.5	T.A.Gonsalves A.Jhunjunwala(EE) B.Ramamurthy(EE) C.Mathiazhagan(EE)
3.	Wireless Local Loop	1993-95	Analog Devices	126+Royalty	T.A.Gonsalves A.Jhunjunwala(EE) B.Ramamurthy(EE) C.Mathiazhagan(EE)
4.	Fibre Optics Railway Signalling and Communication System	1993-95	DOE	17.00	T.A.Gonsalves A.Jhunjunwala(EE) B.Ramamurthy(EE) C.Mathiazhagan(EE)
5.	Development of Neuron Based Distributed Control SCADA System	1993-95	Alacrity Electronics	15.00	T.A.Gonsalves A.Jhunjunwala(EE) B.Ramamurthy(EE) C.Mathiazhagan(EE)

S.No.	Title(s)	Period	Funding Agency	Amount (in Lakhs)	Co-ordinator(s)
6.	Development of New DSP Based Products	1993-95	Analog Devices	7.875	T.A.Gonsalves A.Jhunjunwala(EE) B.Ramamurthy(EE) C.Mathiazhagan(EE)
7.	Ethernet Twisted Pair Remote Bridge	1993-94	Citi Bank	2.50	T.A.Gonsalves A.Jhunjunwala(EE) B.Ramamurthy(EE) C.Mathiazhagan(EE)
8.	Network Libray Information System	1993-94	Intl. Ocean Institute	1.5	T.A.Gonsalves A.Jhunjunwala(EE) B.Ramamurthy(EE) C.Mathiazhagan(EE)
9.	ERNET	1989-97	DOE UNDP	225.0	S.V.Raghavan
10.	Development of Software for Russian-English Translation	-	ISRO	4.95	S.Raman
11.	Development of Software for Content Based Search Telemetry Data for Flight Analysis	-	ISRO	1.25	S.Raman
12.	Voice Conversion	1992-95	DST	8.00	B.Yegnanarayana Hema A.Murthy C.Chandra Sekhar R.Sundar
13.	Development of Neural Network Models for Classification of Sonar Targets	1991-95	DOE	19.63	B.Yegnanarayana C.Chandra Sekhar
14.	Studies in Computational Geometry and Relavant Data Structures	1993-95	MHRD & BMFT		Kamala Krithivasan C.Pandu Rangan
15.	Studies in Computational Geometry and Applications to Robotics	1994-96	DST	5.50	Kamala Krithivasan C.Pandu Rangan
16.	Task Allocation in Parallel Computers	1993-96	INSA	0.60	C.Siva Ram Murthy
17.	On Allocation Problems in Parallel and Distributed Computing Systems	1994-96	DST	2.00	C.Siva Ram Murthy
18.	Application of Artificial Neural Networks for Remote Sensing	-	ISRO	5.00	B.Yegnanarayana R.Sundar C.Chandra Sekhar
19.	Indo-German Project	1993-96	IIT-FRG (BMFT)	-	B.Yegnanarayana N.Ahwar, R.Sundar W.Anheler C.Chandra Sekhar

4.6.14. Books/Monographs Published

Sl.No.	Name of Faculty	Title	Publisher
1.	S.V.Raghavan with B.N.Jain	NETWORKS-'94 PROCEEDINGS	Chapman Hall Publishing Co.
2.	B.Yegnanarayana with P.P.Raghu R.Poongodi	Application of Artificial Neural Networks in Remote Sensing	Department Monograph

4.6.15. Research Publications

1. R.K. Hariram and T.A.Gonsalves, "A DSM-based portable distributed programming testbed", Proc. Networks '94 Int. Conf. Computer Networks, Arch. & Applications, Madras, India, Dec. 94.
2. D. Venkatesulu and T.A.Gonsalves, "A queueing network model of distributed shared memory", Proc. Networks '94 Int. Conf. Computer Networks, Architecture & Applications, Madras, India, Dec. 94.
3. K.S.Easwarkumar, C.Pandu Rangan, and G.A.Cheston, "A linear time algorithm for centering the spanning tree of a biconnected graph", Information Processing Letters, Vol. 51, pp.121 - 124, 1994.
4. P.Jagan Mohan, V.Kamakoti, and C.Pandu Rangan, "Efficient parallel randomised algorithm for closest pair problem in D- dimensions", Proc. IFIP 94, World Computer Congress, Germany, Sep, 1994.
5. C.P.Gopalakrishnan and C.Pandu Rangan, "Edge disjoint paths in permutation graphs", ISSAC'94, Beijing, China, (Appeared in) Lecture Notes in Computer Science Series, Springer verlag, Aug, 1994.
6. C.Pandu Rangan and M.S.Chang, "Irredundance on weighted interval graphs", ISSAC '94, Beijing, China, (Appeared in) LNCS Series, Springer Verlag, Aug, 1994.
7. C.Chandra Sekhar, K.Sakthivel and B.Yegnarayana, "Neural network based approaches for recognition of Stop Consonant Vowel (SCV) segments in continuous speech", Proc. of National Conference on Neural Networks and Fuzzy Systems, NCCNFS'95, Madras, pp.16-22, Mar. 1995.
8. N.Sudha, C.Chandra Sekhar and B.Yegnarayana, "Automatic classification of sonar targets using artificial neural networks", Proc. of National Conference on Neural Networks and Fuzzy Systems, NCCNFS'95, Madras, pp.1-7, Mar. 1995.
9. B.Yegnarayana, C.Chandra Sekhar and S.R.Prakash, "Fuzzification of formant trajectories for classification of CV utterances using neural network models", Proc. of IEEE Workshop on Neural Networks for Signal Processing, Ermioni, Greece, Sep.1994.
10. B.Yegnarayanana, S.R.Prakash, and C.Chandra Sekhar, "Recognition of CV segments using fuzzy neural networks," Proc. of World Congress on Neural Networks, San Diego, USA, June 1994.
11. C.Chandra sekhar and B.Yegnanarayana, "Classification of CV transitions in continuous speech using neural network models," Proc. of International Symposium on Speech, Image Processing and Neural Networks, Hong Kong, pp.97-100, Apr. 1994.
12. Sukendu Das and B.N. Chatterji, "Parallel implementation of a robust algorithm for tracking moving objects", First Intl. Workshop on Parallel Processing, Bangalore, Dec. 26-31, 1994.
13. M.Narendranath, Hema A.Murthy, S.Rajendran, and B.Yegnanarayana, "Transformation of formants for voice Conversion using Artificial Neural Networks", Speech Communication, Vol.16, No.2, February, 1995.

14. Hema A. Murthy, "Pitch extraction from root cepstrum", ICSLP-94, Sept 1994.
15. M.Narendranath, Hema A.Murthy, S.Rajendran, and B.Yegnanarayana, "Voice conversion using artificial neural networks", accepted for presentation at the workshop on Automatic Speaker Recognition, Identification and Verification, Switzerland, April 5-7 1994.
16. B Prabhakaran and S V Raghavan, "Synchronization models for multimedia presentation with user participation", ACM/Springer - Verlag Multimedia Systems, Vol 2, no 2, August 1994, pp 53-62. Also in proceedings of first ACM Conference on Multimedia system, Anaheim, California, Aug 1-6, 1993, pp 156-164.
17. S.V.Raghavan, D.Vasukiammayar, and Gunther Haring, "Generative workload models for computer networks", ACM SIGMETRICS Conference on Measurement and Modelling of Computer Systems, Nashville, Tennessee, USA, May 16-20, 1994. Also appeared in Performance Evaluation Review Vol.22, No.1, May 1994, pp.118- 127.
18. R. Sriram and S V Raghavan, "Example implementation of name services using X.500 directory", Computer Networks and ISDN Systems, 26(1994), 1994, pp 1425-1436.
19. Meena Mahajan and Kamala Krithivasan, "Language operations on cellular automata classes", JMPS, Vol.27, pp.305-320.
20. Meena Mahajan and Kamala Krithivasan, "Language classes defined by time bounded relationised cellular automata classes", RAIRO Theoretical Informatics, Vol.27, pp.403-432.
21. A.Reman, B.Prakash, and Kamala Krithivasan, "Path planning amidst movable obstacles", ICARCV 94, Singapore, November 1994, pp.237-241.
22. Deepak Khemani, "Planning with thematic actions", Proc. of 2nd Int. Conf. on AI Planning Systems (AIPS '94), AAAI, June 1994.
23. PVSR Bhanu Prasad and Deepak Khemani, "Search reduction in blocks world planning", Proc. of 3rd Int. Conf. on Automation, Robotics, and Computer Vision, Singapore, November 1994.
24. B.Yegnanarayana, Deepak Khemani, and Manish Sarkar, "Applications of neural networks for contract bridge bidding", Proc. of National Conf. on Neural Networks and Fuzzy Systems, Anna University, Madras, March 1995.
25. B.Yegnanarayana, "Artificial neural networks for pattern recognition", Sadhana, Vol.19, No.2, pp.189-238, April 1994.
26. B.Yegnanarayana, S.P.Wagh, and S.Rajendran, "A speaker verification system using prosodic features", Proc. ICSLP '94, September 1994.
27. P.P.Raghu, R.Poongodi, and B.Yegnanarayana, "Texture classification using a combined self-organizing map and multilayer perception", Proc. of Int. Conf. on Computer Systems and Education, Bangalore, June 22-25, 1994, pp.145-153.
28. P.P.Raghu, R.Poongodi, and B.Yegnanarayana, "Supervised texture classification using a counter propagation network with SOM principles", Proc. of National Conf. on Neural Networks and Fuzzy Systems, Anna University, Madras, March 1995, pp.8-15.
29. K.N. Balasubramanya Murthy and C.Siva Ram Murthy, "Two-Sided elimination for parallel solution of linear equations using Householder Reductions", in Proc. International Conference on Computer Systems and Education, Bangalore, June 22-25, 1994.

30. K.N. Balasubramanya Murthy and C.Siva Ram Murthy, "A Gaussian elimination based algorithm for parallel solution of linear equations", in Proc. IEEE Int. Conf. on Frontiers of Computer Technology, (TENCON '94), Singapore, August 22-26, 1994.
31. R.S. Ramesh and C.Siva Ram Murthy, "An efficient algorithm for the partitionable independent task scheduling problem using lookahead search", in Proc. of 1st International Workshop on Parallel Processing, December 26-31, 1994.
32. S. Selvakumar and C.Siva Ram Murthy, "Scheduling precedence constrained task graphs with non-negligible inter-task communication onto multiprocessors", IEEE Trans. on Parallel and Distributed Systems, vol. 5, no. 3, pp. 328-336, 1994.
33. K.N. Balasubramanya Murthy and C.Siva Ram Murthy, "Two-sided elimination method for parallel solution of linear equations using Householder reductions", Journal of Parallel Algorithms and Applications, Vol.3, 1994, pp.287-309.
34. Paul P. Ignatius and C.Siva Ram Murthy, "Optimal scheduling of independent jobs in multiprocessor systems", Microprocessing and Microprogramming, the Euromicro Journal, Vol.40, 1994, pp.651-672.
35. S. Mahesh, C.Siva Ram Murthy and C.Pandurangan, "Efficient dynamic job scheduling algorithms for multiprocessor systems", IEICE Trans. on Information and Systems, Vol.E78-D, No.1, 1995.
36. C.S.R. Krishnan, D. Antony Louis Piriya Kumar, and C.Siva Ram Murthy, "A note on task allocation and scheduling models for multiprocessor digital signal processing", IEEE Trans. on Signal Processing, March 1995.
37. B. Pradeep and C.Siva Ram Murthy, "Sorting on mesh connected computers with multiple broadcasting using $n^{2/3} \times n^{2/3}$ processors", International Journal of Computer Systems Science and Engineering, April 1995.
38. Ravi Mittal, "Fault Tolerant 2*2 Switching Element for Multistage interconnection Networks", Int. Conf. on Reliability and Quality in design, Seattle, USA, March 16-18, 1994.
39. Cherian and Ravi Mittal, "Analysis of 1-Ring of Ring (ROR) Network" Journal of Computer Communications, Vol 17, No. 11, 1994, pp.799-804.
40. Ravi Mittal, B.N.Jain and R. K. Patney, "Finding nonfaulty subtrees in faulty binary tree architectures", Journal of Microelectronics and Reliability, Vol 34, No 8, 1994, pp. 1301- 1310.
41. Ravi Mittal and A. K. Agrawala, "A cost effective Unidirectional Binary (UB)-tree Architecture", Proc of International Workshop on Parallel Processing, Dec 26-31, 1994, Bangalore, India, pp. 415-417.

4.6.16. Any other relevant details

1. T.A. Gonsalves, "The friendly neighbourhood computer", Interview on AIR, Madras, Sep.1994.
2. Ravi Mittal, Chaired a session on Network Reliability in Interantional Conference on Reliability and Quality in Design, Seattle, USA, March 16-18, 1994.

4.7 Electrical Engineering Department

4.7.1 Introduction

The Department of Electrical Engineering is an integral one encompassing both the areas of Electrical and Electronics Engineering and also the Centre for Systems and Devices. At present the Department comprises the following laboratories.

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

B.Tech Degree Courses are offered in the following two Streams:

1. Electrical and Electronics Engineering with emphasis on power systems, Electrical machines, control engineering and related subjects.
2. Electronics and Communication Engineering with emphasis on electronics circuits and devices, control engineering, communication systems and related subjects.

The Curriculum Development Cell in the Department of Electrical Engineering has been working on evolving an integrated undergraduate curriculum which will combine into a single curriculum what are now taught separately under the above two separate programmes. This has been implemented in IIT Madras with effect from July 1993.

M. Tech Degree in Electrical Engineering

The following four major streams of study are available at M.Tech level:

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

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

Electronic Circuits, Communication Systems, Digital Techniques and Computer Technology, Electromagnetic Interference and Compatibility, Antennas, Optical Communication, Image and Digital Signal Processing, Laser Communication, Microwave Engineering, Television Engineering, Semiconductor Devices, Amorphous Semiconductor Devices, Control Engineering, Electrical Machines and Drives, Guidance Systems, High Voltage Engineering, Measurements and Instrumentation, Networks and Systems, Simulation of Power Electronic Systems, Power Systems, Photonics, Telematics and Robotics.

4.7.2 New Courses Introduced

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

Sl.No.	Course	Title	Faculty
1	EE 362	Device modelling	K.N. Bhat Amitava Dasgupta
2	EE 620	Amorphous and Poly-crystalline Silicon Mat. & Devices	Enakshi Bhattacharya
3	EE 721	Special Semiconductor Devices	S. Karmalkar Vinita Vasudevan
4.	EE674	Neural Networks and Applications	C. Eswaran M.V.Chalapathy Rao

4.7.3 Details of Faculty

Name and Qualification	Major area of Specialisation
Professors	
Ashok Jhunjhunwala Ph.D.(Maine)	Communication Networks, Fibre optics, Surface Acoustic Wave Devices
M.V.Chalapathi Rao Ph.D.(IIT Madras)	Control Theory
C.Eswaran Ph.D.(IIT Madras)	Networks Digital Filters Microprocessors
P.A. Janakiraman Ph.D.(IIT Madras)	Robotics, Control Systems, Instrumentation Image Processing
A. Kuppurajulu Ph.D. (Moscow)	Power Systems, Computer Applications
M. Mukunda Rao Ph.D. (Andhra)	Lasers, Fibre Optics
M.S.Narasimhan Ph.D.(IIT Bombay)	Antenna Engineering, Applied Electromagnetics
K.Narayana Bhat Ph.D.(IIT Madras)	Semiconductor Fabrication
Y. Narayana Rao Dr.Ing.(Braunschweig)	High Voltage Engineering
K.Radhakrishna Rao Ph.D.(IIT Kanpur)	VLSI, Analog and Digital IC's
J.P. Raina D.Sc.(Louvain)	Fibre Optics, Television
K. Ramar Ph.D.(IIT Madras)	Power Systems, Computer Applications
B. Ramaswami Ph.D.(IIT Madras)	Power Electronics, Control Systems
P. Sankaran Ph.D.(IIT Madras)	Networks, Magnetic Materials
V.V. Sastry Ph.D.(IIT Kharagpur)	Machines, Power Electronics, Simulation
G. Sridhara Rao Ph.D.(IIT Madras) [Head]	Machines, Power Electronics, Simulation
S. Srinivasan Ph.D.(IIT Madras)	Microprocessors, Microcomputers
Vedam Subrahmanyam Ph.D.(IIT Madras)	Power Electronics
V. Venkata Rao Ph.D. (Iowa)	Digital Signal Processing, Communications

Name and Qualification	Major area of Specialisation
C. Venkateshaiah Ph.D.(IIT Madras)	High Voltage, Power Systems
S.S.Yegnanarayanan Ph.D.(IIT Madras)	Electrical Machines, Simulation
Associate Professors	
Bhaskar Ramamurthi Ph.D.(California)	Digital Communication and Communication networks, Signal processing
C. Dattatreyan Ph.D. (Sheffield)	Microwaves
K.M.M. Prabhu Ph.D.(IIT Madras)	Digital Signal Processing
Assistant Professors	
Amitava Dasgupta Ph.D.(IIT Kharagpur)	Si and GaAs Devices, Technology and Simulation
M. Antony Reddy Ph.D.(IIT Madras)	Electronic Circuits
Enakshi Bhattacharya Ph.D.(TIFR Bombay)	Solid State Devices
V. Jagadeesh Kumar Ph.D.(IIT Madras)	Measurements, Instrumentation
S. Karmalkar Ph.D.(IIT Madras)	VLSI, Semiconductor Devices
M. Krishnamurthi M.Tech.(IIT Madras)	Power Systems
P.C.Majhee M.Tech. (IIT Madras)	Measurements, Instrumentation
G.T. Manohar M.Tech.(IIT Madras)	Microprocessors, Computers, Control Systems
Nandita Dasgupta Ph.D.(IIT Madras)	Si and III-V Semiconductor Devices, Technology & Simulation
P. Sasidhara Rao Ph.D.(IIT Madras)	Electrical Machines
Varadarajan Subrahmanyam M.E.(II Sc.)	Microwaves
T.J.Vitto Ph.D. (IIT Madras)	Semiconductors
Lecturers	
C. Mathiazhagan Ph.D.(Univ. of California)	Telematics, RF Communciation, Analog Circuits Devices, CAD for VLSI
Vinita Vasudevan Ph.D.(IIT Bombay)	
Principal Scientific Officer	
P.R. Vaya Ph.D.(IIT Madras)	Semiconductors and Optoelectronic Device Technology
Senior Scientific Officers Grade II	
T.V.Gopal, M.S. (IIT Madras)	Measurements and Instrumentation, Computer System Management, Graphics
M.Kumaravel Ph.D. (IIT Madras)	Instrumentation
K.Ponnuraju Ph.D. (IIT Madras)	Solid State Electronic Devices, Semiconductor Technology
H. Renganathan M.S.(IIT Madras)	DSP, Microprocessor Systems
Senior Design Engineers	
P.Ramaseshagiri Rao M.S.(IIT Madras)	Semiconductor Fabrication
Ranjana Shukla M.S.(IIT Madras)	Microprocessors and Computers
V.N. Shukla M.S.(IIT Madras)	Microprocessors and Computers

4.7.4 Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D	6	-	3	-	3	-	4	1	1	1	17	2	19
M.S.	20	1	9	-	7	3	1	-	-	-	37	4	41
M.Tech.	47	4	33	2	-	-	-	-	-	-	80	6	86
B.Tech.	78	2	62	3	71	4	73	5	-	-	284	14	298
Total	125	6	95	5	71	4	73	5	-	-	423	22	445

4.7.5 Fellowship/Scholarship Holders

Programme	Institute	Others	Total
Ph.D	6	5	11
M.S.	26	1	27
M.Tech	69	6	75
Total	101	12	113

4.7.6 Number of Degrees Awarded

Programme	No. Awarded
Ph.D.	06
M.S.	07
M.Tech.	39
B.Tech.	64
Total	116

4.7.7 Instruments/Equipments Designed and Developed

- * High Pressure Oxidation System (HPOS) with temperature and pressure controlled by a PC
- * Interfacing an interfacing graphics for use with application software.
- * Pulse electroplating power supply for bump growth on semiconductor devices
- * PECVD System
- * A new ultrasonic range meter for mapping the environment for robots (Microprocessor based PC compatible)
- * Micro-controller based slip meter for the wave energy device
- * PC-based data acquisition system for the Wells turbine

4.7.8 New Facilities added and Major Equipments procured

- * 486 upgrades in the PC Laboratory One 2-stack furnace for oxidation and diffusion
- * Development of a menu driven command procedures on VAX/VMS to certain dedicated system management functions
- * Development of an interactive computer program, a package to visually present electrical/electronic drawings using PLOT 10 graphic routines.
- * n-type doping facility and H-passivation line added to the existing plasma enhanced chemical vapor deposition (PECVD) system.
- * Hardware and software procured
- * Sun SPARC-20 workstation to go with SABER Simulator for mixed mode simulation (UNIX Operating system).
- * DYMOLA - Object oriented modelling Language (VMS O/S)
- * KREAN - Power electronic simulator (for teaching & research)
- * VTEK - Tektronic Graphics Terminal emulation on a P.C. (for DCF)
- * Software for layout and simulation of integrated circuits
- * A new Eshed V DC motor operated Robot, PC's 386 and 486.
- * One AT 486 from IRD Funds, to be used for IC Design
- * EMI Testing facilities with 10 kV parallel plate simulator for laboratory experiment on PCB layouts.
- * DEC Alpha 3000 model 300LX 64-Bit system with Terminal Server and Ethernet.

4.7.9 Short-term Courses/Workshops/Seminars/ Symposia Conferences conducted

S.No.	Co-ordinator(s)	Title of Course/Workshop/Seminar/ Symposia/Conference	Period
1.	Dr.V.V. Rao	Digital Techniques in Modern Radio Broadcast	Sep.19-30 1994
2.	Dr. K.M.M. Prabhu Dr. S. Srinivasan	Advanced Topics in Digital Signal Processing	Mar.20-31 1995
3.	K. Ramar	Technology Appreciation Program on Advances in Electrical Power System	Oct. 11 1994

4.7.10. Special Lecture(s) Delivered

S.No	Name of Faculty	Topic of Lecture	Delivered at	Date
1.	V.Jagadeesh Kumar	Data Acquisition and Processing	FCRI Palghat	April 1994
2.	V.Jagadeesh Kumar	Fundamentals of Measurement Engineering	HSL Vizag	May 1994
3.	S.S.Yegnanarayanan	(a) Design of AC Machines (b) Fault Analysis (c) Grounding	BHEL Corporate R&D Advanced Technical Education Centre	10-11 June 1994

S.No	Name of Faculty	Topic of Lecture	Delivered at	Date
4.	S.S. Yegnanarayanan	Electrical Sciences Loads and Distribution System arrangements	IITM ISTE Course on "Planning and design of Building services"	28 June 1994
5.	M. Krishnamurthi	Contact materials for power applications - Their Performance and Selection	IC&SR IITM under TAP on "Advances in Electrical Power Systems"	11 Oct 1994
6.	V.V. Sastry	Digital simulation of Power Electronic Circuits and Systems	Anna University	12-16 Dec 1994
7.	S.S. Yegnanarayanan	Finite Element Analysis of Electrostatic field Problems	IITM FEM-94 STC on "Finite Elements methods in Engineering Analysis"	16 Dec 1994
8.	S. Srinivasan	Recent Advances in Electrical Engineering	National small Industries Corpn. Madras	16 Jan 1995
9.	K.N. Bhat	SDI Technology and Applications	Anna University Madras	8 Feb 1995
10.	S. Srinivasan	Advances in Computer Architecture	Anna University Madras	16 Feb 1995
11.	K.N. Bhat	Integrated Microelectro-chemical sensors and Micromachining	BMS College Bangalore	25 Feb 1995

4.7.11. Visits Abroad

S.No.	Name of Faculty	Country visited	Date	Purpose of visit
1.	V.V. Sastry	Singapore	21-26 Feb 95	To attend an International conference on "Power Electronics and Drive Systems"

4.7.12. Distinguished Visitors to the Department (Important dignitaries)

Sl.No	Name of the Visitor and Occupation	Date of visit	Purpose of visit(Lecture/Discussion)
1.	Anand Rangarajan Dept. of Computer Science Yale University USA	07.09.94	Special Lecture "Optimising network that works"
2.	Dr. Rajiv Ramamurthy IBM USA	08.09.94	Special Lecture "High speed optical networks using WDM"
3.	Mr. J. Gopal Dy. General Manager Madras Telephones Madras	30.09.94	Industry Lecture "Computerisation of Department of Telecommunication"
4.	Dr. Sandeep Chennakeshu Director Advanced Development & Research Ericsson GE Labs North Carolina USA	18.10.94	Special Lecture "Block coded modulation for PCS Systems"

Sl.No	Name of the Visitor and Occupation	Date of visit	Purpose of Visit / Topic (Discussion)
5.	Mr. N. Subramanian Managing Director Tesla Magnetics Pvt Ltd	21.10.94	Industry Lecture "Emerging DC Techniques"
6.	Dr. Nambirajan Seshadri AT&T Bell Labs USA	01.12.94	Special Lecture "Recent Developments in digital modulation: combined data and channel estimation"
7.	Prof. P.R. Kumar University of Illinois USA	09.01.95	Special Lectures " Theory of Learning"
8.	Prof. M. Matsumoto Information Engineering Shinshu University Nagano Japan	18.01.95	Special Lecture "Recent Developments in Magnetic thin films for recording Applications"
9.	Dr. A.K.S. Bhatt Professor of Elec. Engg. University of Victoria Victoria Canada	20.02.95	Special Lecture "Fixed Frequency modified series resonant converters"
10.	Dr. Sashidhara Post-Doctoral Fellow University of Manitoba Winnipeg Canada	24.02.95	Special Lecture "Detection of small tumors in the breast tomography - Digital subtraction"
11.	Mr. K. Ramalingam Regional Executive Director NAA New Delhi	18.03.95	Industry Lecture "Air traffic management and control"
12.	Mr. K. Padmanabhan Manager - Systems TATA Consultancy Services Madras	23.03.95	Industry Lecture "Statistic quality technologies in soft-ware Engineering"
13.	Dr. K.R. Dorairaj Ex. Addl GM and Chief Electrical Engineer (Railways) Madras	24.03.95	Industry Lecture "Railway Management Structure and opportunities for technology advancement"

4.7.13. Sponsored Projects

Sl.No.	Title	Period	Funding Agency	Amount (in lakhs)	Co-ordinator(s)
1.	Education Technology	on going	MHRD/AICTE N.Delhi	6.00	S.Srinivasan
2.	Development of Micro machined Smart Sensors for Mechanical and Bio-medical Applications	2 years	AICTE N.Delhi	20.00	K.N.Bhat A.Dasgupta N.Dasgupta Enakshi Bhattacharya S.Karmalkar Vinita Vasudevan P.R.S.Rao B.R.Bhat B.S.Prabu S.Swarnamani (A.M)
3.	Design & Development of micro machined Silicon Accelerator	1 year	DRDO N.Delhi	24.00	-do-

Sl.No.	Title	Period	Funding Agency	Amount (in lakhs)	Co-ordinator(s)
4.	SOI MOSFET Technology using BESOI wafers operation in radiation environment	1 year	DRDO N.Delhi	2.00	K.N.Bhat A.Dasgupta N.Dasgupta E.Bhattacharya S.Karmalkar Vinita Vasudevan P.R.S.Rao
5.	Development of GaAs based MESFET and HEMT Logic Circuits	2 years	AICTE N.Delhi	10.00	-do-
6.	Thermal Equilibrium in Amorphous Silicon	2 years	DST N.Delhi	1.65	Enakshi Bhattacharya
7.	Study of Silicon Germanium ALLOY	2 years	DST N.Delhi	5.50	Enakshi Bhattacharya A.Subrahmanyam(Phy)
8.	Development of Bipolar & MOS Device Simulator	4 years	DOE N.Delhi	21.25	K.N.Bhat G.Sridhara Rao A.Dasgupta N.Dasgupta Vinita Vasudevan K.N.Seetharam(ME) P.R.S.Rao
9.	Adaptive Moving Target Detection for Radar Signal Processing	3 years	DRDO N.Delhi	9.97	K.M.M.Prabhu
10.	Development of Energy Efficient Control Systems for Wave Energy Systems	3 years	DOD/NIOT N. Delhi/Madras	17.00	S.S.Yegnanarayanan G.Sridhara Rao M.Kumaravel
11.	Simulation of Grid connected Induction Generator driven by a Wave Energy operated Well's Turbine	on going from 1994	-do-	0.90	S.S.Yegnanarayanan G.Sridhara Rao N.V.C.Swamy
12.	Current Controller for reduction of power fluctuations in Wave Power Induction Generator	-do-	-do-	1.5	G.Sridhara Rao S.S.Yegnanarayanan
13.	Object oriented modelling of power electronic circuits and Systems	2 years	Volkswagen Foundation Hannover Germany	14.00	V.V.Sastry
14.	Variable speed constant Frequency-generator applied to a stand alone seawave Energy Extraction	-	NIOT N.Delhi	16.00	V.V Sastry C. Eswaran S.Srinivasan Vedam Subrahmanyam M.Chidambaram (Ch.E)
15.	Feasibility studies on Design and implementation of basic DSP building blocks	2 years	ISRO	2.80	S.Srinivasan R.Sundar H.Renganathan

Sl.No.	Title	Period	Funding Agency	Amount (In lakhs)	Co-ordinator(s)
16.	Study of Neural Network based coding schemes for compression Telemetry Data	2 years	ISRO	2.85	C.Eswaran S.Srinivasan H.Renganathan Subramanyan(OEC)
17.	Energy Monitoring on the wave energy device	2 years	DOD	4.65	V.Jagadeesh Kumar
18.	Wave Measuring Buoy	2 years	NIOT	18.6	V.Jagadeesh Kumar P.M.Koola Anantha Subrahmanyam

4.7.14 Major Consultancy Assignments

S.No.	Title	Year	Sponsor	Amount (Rs.in lakhs)	Coordinator
1.	Doped LPCVD Polysilicon Deposition on 4" dia wafers and Feasibility studies of Silicon Nitride as anti reflection coating on polycrystalline Silicon Solar Cells	94-95	BHEL Corporate R&D Hyderabad	1.20	K.N.Bhat P.R.S. Rao
2.	Fuzzy Logic based selfstart for induction motor drives	Dec.94	ELCOT Power Contacts Ltd.	2.00	V.V.Sastry M.Chidambaram(Ch.E)
3.	Retainer Consultant	-	-do-	@Rs.2000 per month	V.V.Sastry
4.	Common Efficient treatment plants	94-95	TALCO/TNPCB	15-20	Y.N.:Rao & faculty from CE, ME, & Ch.E
5.	Surface mounted Samarium cobalt brushless Permanent Magnet prototype alternators I & II for NSTL- Design Testing and Evaluation.	94-95	NSTL Vizag	0.95	S.S.Yegnanarayanan G.Sridhara Rao
6.	Development of static Inverter for high speed drives for portable tools. Single motor and Ggroup motor drives under USAID- PACER-IITM Program	Since 1994	Electro dynamic Industries	3.00	G.Sridhara Rao S.S.Yegna Narayanan K.R. Rao M. Kumaravel
7.	TAMIN-Graphite Benefication Plant ICSR Inter disciplinary	Since 1993	Institute Consultancy	18.00	S.S.Yegna Narayanan G.Sridhara Rao Dean,ICSR
8.	Development of Knudsen cells for Molecular Beam Epitaxy	ongoing	SMP Enterprises Pune.	0.12	K.Ponnuraju
9.	Design & Development of Bedside ECG Monitor	93-95	Siemens	6.00	A.Jhunjhunwala BhaskarRamamurthi T.A Gonsalves C.Mathiazhagan

S.No.	Title	Year	Sponsor	Amount (Rs.in lakhs)	Coordinator
10.	Wireless local loop	94-97	Analog Devices	126.00	A.Jhunjhunwala BhaskarRamamurthi T.A Gonsalves C.Mathiazhagan
11.	Design & Development of DSP-based products	'95	Analog Devices	7.50	-do-
12.	Digital telephone answering machine	'94	BPL/Analog Systems	11.0+Royalty	-do-

4.7.15. Research Publications

(a) Papers published in Journals:

1. Elwin Chandran Morie and S. Srinivasan, "Adaptive Vector Quantization scheme for Image coding using Adaptive Thery Neural Networks" Advances in Modelling and Analysis, B, vo 36, No. 3, pp49-55, 1955.
2. T. Balaji Suresh, S. Satish Kumar, S. Karmalkar and E. Bhattachrya, "Electroless plated Ni-P contacts to Hydrogenerated Amorphous Silicon", Thin Solid Films, 252, pp 78-81, 1994.
3. P. Sivakumar and K.M.M. Prabhu, "A set of New Fast Algorithms for DCT's and DSTs", International Journal of Electronics, vo. 76, No. 4, pp 553-568, 1994.
4. P.A. Janakiraman and Shrti Yadav, "OMNI Directional Mobile ROBOT", Proc. of Electronic Systems and Applications, March 1994.
5. P.A. Janakiraman and Jwalant Desai, "Simultaneous Computer Control of multiple stepper motors", Proc. of Electronic Systems and Applications, March 1994.
6. A. Dasgupta and N.Dasgupta, " A simple Analytical Model for Gate Capacitance-Voltage Characteristics of HEMTs", Solid State Electronics, vol 37, pp 1377-1381, July 1994.
7. C. Basavana Goud and K.N. Bhat, "Analysis and optimal Design of Semi-Insulatore Passivated High Voltage field plate structures and comparison with dielectric passivated structures", IEEE Transactions on Electron Devices, USA, vol ED41, No. 10, pp 1856-1865.
8. D.V.S.S.Siva Sarma, C. Venkataseshiah and S.S. Yegnanarayanan, "Modelling of internal voltage distribution of steep fronted surge voltages in large HT motor windings", Modelling, Measurement and Control, Pt.A, AMSE Press, France, vol 58, No. 3, pp 37- 49, 1994.
9. C. Venkataseshiah, S.S. Yegnanarayanan and D.V.S.S. Siva Sarma, "Similation of over voltages in HT induction motors due to non-simultaneous pole closure", Journal of the Inst. of Engineers (India), EE Divn., vol 75, pp 119-125, November 1994.
10. P.A. Janakairaman and Abijit Bhattacharya, "Accurate idnetification of systems using periodic inputs", AMSE Conference Proceedings, December 1994.
11. M. Babu and C. Eswaran, "Robust system identification with Hermite interpolation" Advances in Modelling and analysis, vo. 49, No.2, pp 21-38, 1995.
12. K. Sudhakra Rao, V. Jagadeesh Kumar and P. Sankaran, "Precision frequency independent variable phase-phase shifter", Electronic Letters, vol. 31, No. 3, pp 154-155, 1995.
13. A.S.R. Murty, S. Parameswarn and K. Ramar, "Location and Design of stabilisers in Multimachine Power System", International Journal on Electric Power and Energy Systems, to appear in Feb 1995.
14. K. Ramar and M.S. Raviprakash, "Determination of Weak Bus Ordering Vector in Multimachine Power Systems from Voltage Stability View Point", Electric Machines and Power System, accepted for publication.

15. K. Ramar and M.S. Raviparakash "Design of Compensation Schemes for Long Transmission Lines for Maximum Power transfer Limited by Voltage Stability", International Journal of Electric Power and Energy Systems, vol. 17, No.2, 1995.

(b) Papers presented in Conferences/Symposia:

16. S.K. Lahiri, S.K.Lal, S. Banerji, D. Das, N. Dasgupta and P.K. Basu, "Photoluminescence and photosensitivity of front- surface anodised porous silicon film", Conference Emerging Optoelectronic Technologies, I.I.Sc., Bangalore, pp 42-45, July 1994.
17. S.S. Yegnanarayanan and V.U. Hangari, "Simulation and test results of performance of a diesel engine driven brushless alternator with combined a.c. and thyristor fed d.c. loads", 8th National Power Systems Conference, New Delhi, pp 471-476, December 1994.
18. D.V.S.S. Siva Sarma, S.S. Yegnanarayanan and C. Venkateshaiah, "Computation of a maximum switching-on over voltages in HT Motors", 8th National Power Systems Conference, New Delhi, December 1994.
19. Elwin Chandra Monie and S. Srinivasan, "Image compression scheme based on Adaptive resonance theory Neural Network Architecutre," National Seminar on Modern Telecom. Networks, Coimbatore, October 1994
20. K. Ponnuraju and Sajiv Kumar, "Studies of Simulation of MBE growth of InGaA's", International Seminar on Microelectronic Manufacturing '94, Austin, Texas, USA, October 1994.
21. B. Srinivas, G. Suresh and V.V. Sastry, "Micro-controller based SVC with fault diagnosis", EPTRAN '94, Current Trends in Electronic Power Transmission, pp 31-38, November 1994.
22. R.S. Janardhana Iyengar and V.V. Sastry, "Oscillations in voltage-controlled conduction motor drives", Proc. of International Conference on Power Electronics and Drive Systems, PEDS, IEEE Catalogue No. 95 TH8025, pp 123-128, 1995.
23. Allabaksh L Naikodi and G. Sridhara Rao, "A New Controller for efficient Wave Power Generation", IEEE/IAS International Conference on Industrial Automation and Control, Hyderabad, January 1995.
24. H.C. Nagaraj, S. Radhakrishnan and S. Srinivasan, "A Real- time recording system for Brainstem Auditory evoked responses and the study of stimulus polarity effects", IEEE Reginal Conference on Biomedical Engineering, New Delhi, February 1995.
25. P.M. Koola, M. Ravindran and V. Jagadeesh Kumar, "Performance Studies on proto type wave energy plant at Trivandurm", Indian National Conference on Harbour and Ocean Engineering, June 1994.
26. M.A. Atmanand, V. Jagadeesh Kumar and P. Sankaran, "A novel method of measurement of power factor", National Symposium on Advances in Computer Applications and Instrumentations, Madras January 1995, pp T6.3.1 to T6.3.5.
27. V. Jagadeesh Kumar, C. Badarinath and P. Sankaran, "A PC- based equipment for a.c. testing of soft ferromagnetic materials" Magneto electronics International Symposium, Nagano, Japan, November 1994, pp 31-35.
28. A.S.R. Murthy, S. Parameswaran and K. Ramar, "Location and Design of Power System Stabilizers in Multimate Power Systems", National Power System Conference, New Delhi, 1994.

4.8 Humanities and Social Sciences Department

4.8.1 Introduction

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

- * undergraduate courses in Humanities and Social Sciences.
- * M.Tech. courses in Industrial Management
- * M.S. and Ph.D. courses in Operations and Manufacturing Systems Management, Materials Management, Reliability Engineering, Financial Management and Business Policy & Strategy, Organisational Behaviour, Personnel Management and Industrial Relations, Applied Decision Analysis, Operations Research, Systems Analysis and Modelling, Forecasting Methods, Science and Technology Policy Studies.

German Literature, New Literature in English, Applied Economics, Applied Econometrics, Modern Indian History, Socio Economic Cultural Developments, Industrial and Social Psychology, Theoretical Linguistics, Teaching of English as a Second Language (T.E.S.L), Sociolinguistics, Generative Phonology, English for Specific Purpose (ESP) and Psycholinguistics.

4.8.2 Details of Faculty

Name & Qualification

Major area of Specialisation

Professors

S.Ambirajan, Ph.D.(Andhra), Ph.D(Manchester)

Economics, Economic History, Development Economics

Dipak Chaudhuri, Ph.D.(IIT Kharagpur)

Reliability Engineering, Operations Research, Production & Materials Management, Maintenance Management

A.V.Krishna Rao, Ph.D.(Andhra)

Effective Communication in English, Technical Reports, Indian Writing in English.

R.Rajagopalan, Ph.D.(IIT Kanpur)[Head]

Production Management, Group Technology, Science and Technology Policy, German

L.V.L.N.Sarma, Ph.D.(IISc)

Financial Management, Business Policy & Corporate Strategies.

Associate Professors

T.T.Narendran, Ph.D.(IIT Madras)

Operations Management, Decision Support Systems, Group Technology

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

Modern Indian History, Labour History.

R.N.Anantharaman, Ph.D.(Bangalore)

Organisation and Consumer Behaviour, Social Psychology, Psycholinguistics

S.C.Chaudhary, Ph.D.(CIEFL Hyderabad)

Theoretical Linguistics, ELT & Need Based Courses in English.

L.S.Ganesh, Ph.D.(IIT Madras)

Technology Forecasting, Multicriteria Decisions, Project Management and Applied Systems Analysis.

Assistant Professors

(Mrs)Elizabeth Nainan Kurian, Ph.D(IIT Madras)

American Fiction

Name & Qualification	Major area of Specialisation
(Ms)Evangeline Manickam, Ph.D.(Madras)	English, French
T.J.Kamalanabhan, Ph.D.(Madras)	Industrial Psychology, Organisational Behaviour.
V.S.Kumar, M.A.(Andhra)	English, Technical Communication
(Mrs)Malathy Duraisamy, Ph.D.(Madras)	Applied Economics/Econometrics, Labour Economics, Economics of Science and Technology.
V.R.Muraleedharan, Ph.D.(IIT Madras)	Health Economics, Public Policy, HistoryofHealthcare in South India
C.Rajendran, Ph.D.(IIT Madras)	Production Management, Scheduling, Computer Simulation.
B.Subramanian, Ph.D.(Karnatak)	German and Philosophy
D.Veeraraghavan, Ph.D.(IIT Madras)	Social and Economic History, Labour Movements.
M.Durgaprasada Rao, M.B.A(Andhra)	Management Accounts, General Management.
S.Mohan, M.A.(Madras)	English, Science Fiction.
S.Jayachandran, Ph.D.(IIT Madras)	Marketing Management
G.Srinivasan, Ph.D.(IIT Madras)	Group Technology, Production Management, Operations Research.
Visiting Faculty	
(Mrs)Zoya Abraham	German Language Teaching
(Mrs)Devaki Reddy	English

4.8.3 Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D.	3	1	2	4	6	1	2	2	3	2	15	11	26
M.S.	1	-	3	-	2	-	-	-	-	-	6	-	6
M.Tech.	22	1	20	3	-	-	-	-	-	-	42	4	46
Total	26	2	25	7	8	1	2	2	3	2	64	14	78

4.8.4 Number of Scholarships/Fellowships holders

Programme	Institute	CSIR	Others	Total
Ph.D	21	1	4(QIP)	26
M.S.	6	-	-	6
M.Tech.	40	4(SPON)	2(QIP)	46
Total	67	5	6	78

4.8.5 Number of Degrees Awarded

Programme	Number
Ph.D	1
M.S.	3
M.Tech.	14
Total	18

4.8.6 New Facilities added and Major Equipment procured

The Department's LAN was upgraded and extended.

4.8.7 Short-term Courses/Workshops/Seminars/Symposia/Conference organised

SI.No.	Co-ordinator(s)	Title of Course/Workshop/Seminar/Symposia/Conf.	Period
1.	Dr S C Chaudhary	Better Teaching Techniques	July 1994
2.	Dr S C Chaudhary	Educational Technology for Language Teachers	Nov. 1994
3.	Dr T J Kamalanabhan M Durgaprasada Rao	Small Industries Management Assistants Programme	14 Weeks 10.6.94-16.9.94
4.	Dr Elizabeth N Kurian	Professional Communication in English	Aug. 1994
5.	S Mohan Dr.SC Chaudhary	Teaching Methodology for Teachers in Engg. Colleges	June 1994
6.	Dr R N Anantharaman	Human Resource Development for Administrative Officers	Oct. 1994
7.	Dr R Rajagopalan Dr TT Narendran Dr G Srinivasan	In- house Programme on Cellular Manufacturing for TAFE Madras	June 1994
8.	Dr Evangeline Manickam	Seminar on Asian Immigrant Literature	March 1995

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

SI.No	Name of Faculty	Title	Period/Duration
1.	Dr S C Chaudhary	Internet as a Resource in TEFL at American Seminar, Salzburg, Austria	21-29 Oct'94
2.	Dr Elizabeth N Kurian	International Literature Conference LITCON'94, Malaysia	8-10 Nov'94
3.	Dr G Srinivasan	International Conf. on Stochastic Models, Optimization Techniques and Computer Applications held at PSG College of Technology	15-17 Dec'94
		27th Annual Convention of ORSI at IIM Calcutta	20-22 Dec'94
		17th International Conf. on Computers and Industrial Engg. Arizona USA	6-8 Mar'95
4.	Dr R N Anantharaman	International Congress of Applied Psychology'94, Madrid (Spain)	16-23 Jul'94
5.	Dr Evangeline Manickam	Conference on American & Commonwealth Women's Discourse	11-15 Jan'94
		Indian Association for American Studies	April'94
6.	Dr S Ambirajan	Ancient & Medieval Economic Thought, USA	11-13 Jun'94
7.	Dr R Rajagopalan	38th Annual Meeting of International Society for the System Sciences, USA	14-19 Jun'94
		7th International Symposium on World Trends in Science & Technology Education, Netherlands	24-31 Aug'94

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

Sl.No.	Name of the Faculty	Topic of the Lecture	Delivered at	Date
1.	Dr S C Chaudhary	Sense & Sound:Teaching Poetry	Bharathidasan Univ. Truchy	11.02.94
2.	Mr S Mohan	Effective Teaching	ISTE Workshop Anna University	27.1.94 & 28.1.94
3.	Dr G Srinivasan	Cellular Manufacturing Algorithms for Machine-Cell Part Family Formation in CMS.	Brakes India Univ. of Texas	14.12.94 10.03.95
4.	Dr R N Anantharaman	Family as Basic Entity	Intl. year of Family, Loyola College	07.02.94
5.	Dr TT Narendran	Demand Pull System Comparison with MRP II and Push System.	Brakes India	14.12.94

4.8.10 Sponsored Projects

S.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Co-ordinator(s)
1.	Business of Better Writing	1993-94	ISTE Res. Dev.	0.15	Prof A V Krishna Rao Dr S C Chaudhary
2.	Dev. of DSS for Aggregate Planning & Scheduling in CMS	1993-95	MHRD	6.00	Dr.G.Srinivasan Dr.R.Rajagopalan Dr TT Narendran
3.	A DSS for Cell formation in Group Technology	1993-95	DST	1.45	Dr.G.Srinivasan

4.8.11 Major Consultancy Assignments

Title	Organisation	Amount	Co-ordinator(s)
"Cell Management System" - Software Development	Lucas TVS Ltd.	25000	Dr G Srinivasan

4.8.12 Honours and Awards

Name of Faculty	Honours/Awards
Dr S C Chaudhary	IATEFL Prize on Best Article on Teaching Spoken English

4.8.13 Books

Name	Title	Publisher
Sanjay K Nambiar Srinivasan G	Cell Formation using Zero-one Matrices - Some New Insights in Stochastic Models, Optimization Techniques and Computer Applications	Wiley Eastern Ltd.

4.8.14 Research Publications

1. Ramachandran C & Veeraraghavan D 'Working Class: The Left and the Congress Ministry 1937-39 A Study of Press Workers of Madras City'.
2. Chaudhary S C 'India & the Global English Language Market in University News, 23-24 1994 1-8.
3. Chaudhary S C 'Reducing Barriers of Communications Across Indian Languages' in SADHANA 19.1 1994, 129-146.
4. Chaudhary S C 'Making Sense of Spelling and Pronunciation' in Modern English Teacher 3.3 1994 82-83.
5. Chaudhary S C 'Live or Leave: Orthographic Use of Syllabic Systems for Teaching Length Distinction in English' In SPEAK OUT! (4 Aug 1994 26-7).
6. Chaudhary S C 'Towards a Model of Teaching Spoken English' in Explorations in Applied Linguistics, 1995, 106-119.
7. Chaudhary S C 'Real English and Its Dictionary' No.125 Nov 1994 IATEFL Newsletter 10-13.
8. Rajendran C 'A no-wait Flowshop Scheduling Heuristic to Minimize Makespan', Journal of Operational Research Society, Vol.45, no.4, 472-478 (1'994).
9. Rajendran C, Gajpal P.P., Ganesh L S, 'Criticality Analysis of Spare parts using the analytic hierarchy process', International Journal of Production Economics, Vol.,35, 293-297 (1994).
10. Rajendran C, 'A Heuristic for scheduling in a flowshop and flowline-based manufacturing cell with multi-criteria,' International Journal of Production Research, Vol., 32, 2541-2558 (1994).
11. Kurian E N, 'Female Consciousness in the Protagonist in Edith Wharton's "The House of Mirth" in American Literature Today, (ed. Suman Bala), Intellectual Publishing House, New Delhi, 1994 pp. 35-40.
12. Kurian E N and Bindu C B, "Reformulating Differences in the Feminist Discourse - The Female Hetrosexual Lover in Garyl Churchill's "Top Girls", The Litererally Half-yearly , vol., xxxv, No.1, Jan.94 pp. 91-105.
13. Kurian E N 'J.D.Salinger; The Assimilated Jewish, American Writer', Contemproary American Jewish Novel, (ed. Anand T.S.) ABS Publications, Jallundar, 1994, pp. 212-219
14. Srinivasan G A Clustering Algorithm for Machine - Cell formation in Group Technology using minimum spanning trees. International Journal of Production Research 1994, vol.32, No.9 2149-2158.
15. Sanjay K Nambiar & G Srinivasan, 'Cell Formation Using ZXero-one matrices - some new insights' International Conf. on Stochastic Models, Optimization Techniques and Computer Applications' 15-17, Dec'94
16. Srinivasan G 'Cell Formation using zero-one matrices - experiences with real-life data and inferences' 17th International Conference on Computers and IE, Arizona, March 6-8 1995.
17. Sekar Vembu and Srinivasan G, 'Heuristics for Operator Allocation and Sequencing in Just-in-Time How Line Manufacturing Cells, 17th International Conference on Computers and IE, Arizona, March 6-8 1995.
18. Hemant Kumar N S & Srinivasan G, 'Predicting the Quality of the Final Product using Multivariate Statistical Techniques.' A case study, 17th International Conference on Computers and IE, Arizona, March 6-8 1995.
19. Meenakshi R & Srinivasan G 'Machine Cell and Part Family Formation in Group Technology using Chernoff Faces', presented at 27th Annual Convention of ORSI Calcutta Dec 20-22, 1994.
20. Hemant Kumar N S & Srinivasan G 'A Genetic Algorithm for Job Shop Scheduling' 27th Annual Convention of ORSI Calcutta Dec 20- 22, 1994.

21. Sekar Vembu & Srinivasan G, 'Operator Allocation in Sequencing in Just-in-Time Production System', 27th Annual Convention of ORSI Calcutta Dec 20-22, 1994
22. Alexander Chacko & Anantharaman R N 'Organisational Effectiveness and Its Relation to Organisational Climate', Journal of Psychological Researches, V-38, 2, 46-54, 1994.
23. Radha S & Anantharaman R N, 'Why Quality Circle Programs Fail? An Evaluation Study', Indian Journal of Applied Psychology, Vo.31, 2, 1-8, 1994.
24. Anantharaman & Jagadeesh 'Perception of Organisational Climate by Unionised and non-unionised Wmployees'. Indian Journal of Applied Psychology. Vol.31, 2, 17-20.
25. Mahadevan B and Narendran T T 'A Hybrid Modelling Approach to the design of AGV-based material handling system for an FMS', International Journal of Production Research [IJPR], Vol 32, No.9, 2015-2030, 1994.
26. Venugopal V and Narendran T T 'Machine Cell Formation through neural Network Models', IJPR, Vol32, No.9, 2105-2116, 1994.
27. Kochikar V P and Narendran T T 'On using abstract models for analysis of flexible manufacturing systems', IJPR, Vol.32, No.10, 2302-2322, 1994.
28. Thangamani G, Narendran T T and Subramanian R, 'Assessment of availability of Fluid Catalytic Crackin unit through Simulation', Reliability Engineering and Systems Safety, Vo.47, 207- 220, 1995.
29. Santhakumar V, Rajagopalan R, and Ambirajan S., "Planning Kerala's Irrigation Projects: Technological Prejudices and Politics of Hope", Economic and Political Weekly, Vol.XXX, No.12, March 25, Pp.A30-A38, 1995.
30. Rajagopalan R and Santhakumar V, "Understanding the Socio- Technological Systems of the Developing Countries: A Historical- Evolutionary Approach" Proceedings of the 38th Annual Meeting of the International Society for System Sciences, Pp.1293-1302, 1994.
31. Rajagopalan R and Santhakumar V, "Coping with Eco-Consciousness: Integrating Ecology into the Curriculum of Technology", Proceedings of the 7th Symposium of the International Organization for Science and Technology Education, Pp.704-713, 1994.
32. Santhakumar V and Rajagopalan R, "Bio-Energy of the Humid- Tropical Kerala: Limitations of the Conventional Technological Packages and Policy Prescriptions", Presented at the International E-mail Conference on Tropical Bio-Energy Systems organized by the International Union of Forestry Research Organizations, September, 1994.
33. Santhakumar V, Rajagopalan R and Ambirajan S., "Technological Prejudice and Politics of Hope in Kerala's Irrigation" paper presented at the International Conference on Political Economy of Water organized by the Social Science Research Council of USA, Madras, December 1994.

4.9 Mathematics Department

4.9.1 Introduction

Department of Mathematics was established in 1959. Now Ph.D and M.Sc. Programmes in Mathematics are offered. In addition, the Department teaches courses in Mathematics to B.Tech., M.Tech and Ph.D students of this Institute. The major areas of teaching and research of the department are:

1. Continuum Mechanics
2. Stochastic Process and their Application
3. Graph Theory
4. Cosmology
5. Operations Research
6. Functional Analysis
7. Mathematical Modelling
8. Approximation Theory
9. Application of Algebras

4.9.2 Details of Faculty

Name and Qualification

Major area of Specialisation

Professors

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

Fluid Mechanics, Suspension Rheology Polar Fluids, Low Reynold's number flows

P.Bhattacharyya, Ph.D(London)

Complex Analysis, Theory of Splines Lacunary Interpolation, Approximation Theory

V.B.Johri, Ph.D(Gorakhpur)

Theory of relativity, Brans-Dick theory, Cosmology, The early universe, The interface of cosmology, High energy physics, Astronomy and Astro Physics, The Physical, Chemical and Biological Evolution of the Universe

(Mrs.)S.Kalpakam, Ph.D(IIT Madras)

Applied probability and Stochastic Processes

S.N.Majhi, Ph.D(IIT Madras)[Head]

Fluid Mechanics, bio-fluid Mechanics, Mathematical Modelling

P.R.Parthasarathy, Ph.D(Annamalal)

Applied Probability and Stochastic models, Mathematical ecology, Operations Research, Statistical inference

H.S.Paul, Ph.D(Kharagpur)

Electricity, Piezoelectricity, Wave Propagation, Biomedical, Engineering

U.N.Srivastava, Ph.D(IIT Madras)

Applied Mathematics, Differential Equations, Continuum Mechanics, Singular Perturbation Problems, Boundary Layer theory, Differential inequalities, Mathematical ecology, Dynamical systems

V.Subba Rao, Ph.D(IIT Kharagpur)

Numerical Analysis, Approximation theory, Computational fluid dynamics

Name and Qualification

R.Subramanian, Ph.D(IIT Madras)

Major area of Specialisation

Applied Probability, Stochastic Processes, Operations Research, Queues, Inventory and Reliability

Associate Professors

C.M.Purushotham, Ph.D(IIT Kharagpur)

Hydrodynamic stability and wave propagation problems, Magneto-hydrodynamics, Dust gas dynamics

S.N.Venkatarangan, Ph.D(IIT Madras)

Fluid Mechanics, Variation Methods, Dual variation principles, Approximation methods

S.H.Kulkarni, Ph.D(IIT Bombay)

Functional Analysis and Numerical analysis

C.V.Raghava Rao, Ph.D(IIT Madras)

Fluid Mechanics, Numerical methods in fluid mechanics

P.V.Subrahmanyam, Ph.D(IIT Madras)

Fixed point theory and applications, Fuzzy sets

Assistant Professors

S.G.Kamath, Ph.D(Delhi)

Theoretical Physics, Elementary Particle Physics

Y.Nagendra, Ph.D(IIT Kharagpur)

Statistical quality control, Statistical methods and analysis, Identifying the factor(s) responsible for the poor (or good) quality items. Analysis of variance response surface, analysis (to find the optimal factor combination)

A.Rangan, Ph.D(IIT Madras)

Probability theory, Stochastic Processes, Operations Research, Application to Biological Sciences, Neural models, inventory controls, Ecology, Reliability

(Mrs.)W.B.Vasantha, Ph.D(Madras)

Group Theory, Ring rings theory, Group Lattice theory, Semi groups coding theory, Application of Algebra

P.Veeramani, Ph.D(IIT Madras)

Fixed point theorems and their applications to problems in Optimization and best approximation

(Mrs.)R.Usha, Ph.D(IIT Madras)

Fluid Mechanics

S.A.Choudam, Ph.D(IIT Madras)

Graph Theory, Combinatorics

Senior Scientific Officer Grade I

K.Swaminathan, Ph.D(Agra)

Fluid Dynamics, Ship-hydrodynamics, System simulation and Development of Software for Control Systems, Mathematical Problems related to Naval Architecture and Ocean Engineering

4.9.3 Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D	3	2	1	2	4	1	7	-	3	2	18	7	25
M.Sc.	12	15	14	9	-	-	-	-	-	-	26	24	50
Total	15	17	15	11	4	1	7	-	3	2	44	31	75

4.9.4 Number of Scholarship Holders

Programme	Institute	Project	CSIR	NBHM	QIP	Total
Ph.D	15	2	6	1	1	25
M.Sc.	40	-	-	-	-	40
Total	55	2	6	1	1	65

4.9.5 Number of Degrees Awarded

Programme	Number Awarded
Ph.D	7
M.Sc.	27
Total	34

4.9.6 Short-term Courses/Workshops/Seminars/Conferences Organised

S.No.	Title	Date	Co-ordinator(s)
1.	3 day Symposium on Early Universe	20-12-94 to 22-12-94	Prof.V.B. Johri
2.	One day Symposium on Mathematical Methods and Applications	23-12-94	Prof. R.Subramanian
3.	Forays '95	10-3-95 & 11-3-95	Prof.V.B.Johri Dr.R.Usha

4.9.7 Lectures Delivered

S.No.	Faculty	Title	Venue	Date
1.	Prof.U.N.Srivastava	Calculus of Variations	Barathidasan Univ.	21-02-94- 22-02-94
2.	Prof.U.N.Srivastava	Mathematical Modelling	Barathidasan Univ.	22-11-94 & 22-11-94
3.	Prof.U.N.Srivastava	Population Models	Anna Univ.	15-02-95
4.	Dr.S.H.Kulkarni	Internal Programme in Banach Spaces	Mathematisches Institute, Univesitat Tubingen, Germany	16-06-94
5.	Dr.S.H.Kulkarni	Gelfand Naimark Theorems for quateruionic Banach Algebras	Mathematisches Insitut, Universitat Munster, Germany	21-06-94
6.	Dr.S.A.Choudam	Ramsay Theory	Dept. of Mathematics, Karnataka Univ. Dharwar	May 94
7.	Dr.S.A.Choudam	Ramsay Numbers	Dept. of Mathematics, IIT Kanpur	22-09-94
8.	Dr.P.Bhattacharyya	On Fixed Permit of Multi Functions	Indian Sci. Congress Jadavpur	3.01.95 to 8.01.95

4.9.8 Books and Monographs

S.No.	Name of Faculty	Title	Publisher
1.	S.N.Majhi P.Achuthan	Monographs on Mathematical Modelling in Science and Technology	CCE - IIT Madras

4.9.9 Research Publications

1. G.Thangamani, T.T.Narendran and R.Subramanian, Assessment of availability of a Fluid Catalytic Cracking Unit through Simulation, Reliability Engineering and Systems Safety, 47(1995) 207- 220.
2. V.B.Johri, Cosmological Models with Particle Creation and Bulk Viscosity (1994), General Relativity and Gravitation, 26,(1) 41-51.
3. V.B.Johri, Cosmological Models with constant deceleration parameter in Nordredt's Theory, (1994), Pramana, 42(6), 473-481.
4. V.B.Johri, Cosmological Models with constant deceleration parameter in Brans-Dicke Theory (1994), General Relativity and Gravitation, 26(12), 1217-1227.
5. V.B.Johri, Towards an alternative to the Big Bang Theory (1995), Journal of Indian Math Society, 61, 46-56.
6. S.N.Majhi and V.R. Nair, Pulsatile flow of Third Grade Fluids under Body Acceleration - Modelling Blood Flow, Int.J.Engng. Sci.Vol.32 No.5 pp.839-846, 1994.
7. S.N. Majhi and V.R.Nair, Flow of Third Grade Fluid Through Stenosed Tubes, Proc. Indian Natn. Sci. Acad.60 A No.2 1994 pp.535-542.
8. S.N. Venkatarangan and K. Rajalakshmi, A Modification of Adomian's Solution for Non Linear Oscillatory Systems, Computers Math. Applic. Vol.29, No.6, pp.67-73, 1995.
9. S.N. Venkatarangan and K. Rajalakshmi, Modification of Adomian's Decomposition method to Solve Equations Containing Radicals. Computers Math. Applic. Vol.29, No.6, pp.75-80, 1995.
10. S.H. Kulkarni, Representation of a Real B^* Algebra on a Quaternionic Hilbert Space. Proc. Amer. Math. Soc. 121(2), 1994, 505-509.
11. Sushama Agrawal and S.H. Kulkarni, A Spectral Theorem for a Normal Operator. Act.Sci.Math (Szeged) 59/3-4, 1994.
12. S.H. Kulkarni and Sushama Agrawal, An Intrinsic Proof of a Real Analogue of Fuglede-Puthem-Rosenblum theorem, mathematics Today 12 (1994) 3-6.
13. A. George and P. Veeramani, On Some Results in Fuzzy Metric Spaces, Fuzzy Sets and Systems 64 (1994), 395-399.
14. S.A. Choudum and K. Kayathri, There are no Edge Chromatic 4-Critical Graphs of order 12, Discrete Mathematics, Vol.130 (1994).
15. H.S. Paul and V.M. Murali, Vibration of a Hollow Circular Cylinder of Visco Electrical Material, Second Annual Conference of Indian Society of Industrial and Applied Mathematics, February 23-25, 1994 pages C6, 1-9.

16. H.S. Paul and K. Natarajan, Flexural Vibration in a Finite Piezoelectric Circular Cylinder of Crystal Class 6mm, International Journal of Engg. Sci., Vol.32, pp.1303-1314, 1994.
17. H.S. Paul and K. Natarajan, Torsional Vibration of a Finite Piezoelectric Bone, Indian Journal of Pure and Applied Mathematics, Vol.25, pp.891-901, 1994.
18. H.S. Paul and K. Natarajan, Axisymmetric Free Vibrations of Piezoelectric Finite Cylindrical Bone, The Journal of Acoustical Society of America, Vol.96, pp.213-220, 1994.
19. H.S. Paul and K. Natarajan, Axisymmetric Free Vibration of Piezoelectric Finite Hollow Cylinder - Proceedings of Third International Congress on-air-and structure-borne sound and vibration, June 13-15, pp.1831-1838, 1994.
20. H.S. Paul and V.K. Nelson, Axisymmetric vibration of Piezoelectric composite cylinders, Proceedings of Third International Congress on-air and structure-borne sound and vibration, June 13- 15, pp.137-144, 1994.
21. H.S. Paul and V.M. Murali, Wave Propagation in Thermoboroelastic plate, Journal of Acoustical Society of America, Vol.96, p.3293, 1994.
22. P. Bhattacharyya, Fermat's Last Theorem (expository article), Ganit Bikash, Vol.14, Jan-June, 1994, 20-24.
23. S. Kalpakam and K.P. Sapna, Continuous Review (s,S) Inventory System with Random Lifetimes and Positive Leadtimes, Operations Research Letters, 15, No.2, 115-119, (1994).
24. C.V. Raghavarao and Y.V.S.S. Sanyasiraju, Universal Matrices with new infinite elements for quasi-harmonic equation, Comm. Numer. Methods Eng. 10, 321-331, (1994).
25. C.V. Raghavarao, Y.V.S.S. Sanyasiraju and S. Suresh, A Note on Application of cubic spline to two point boundary value problem, Computers Math. Applic. Vol. 27, No.11, pp.45-48 (1994).
26. C.V. Raghavarao and Y.V.S.S. Sanyasiraju, Natural convection heat transfer of cold water between concentric cylinders for high Rayleigh numbers - A Numerical Study, Int.J. Engng. Sci. Vol.32, No.9, pp.1437-1450 (1994).
27. W.B. Vasantha, A new type of group rings and its zero divisors, Univ.Sci. Phyl. Sci. Vol.6, 134-137, (1994).
28. W.B. Vasantha, J-semigroups and J.Semigroup rings, The Maths Education, Vol.XXVII, 84-86, (1994).
29. W.B. Vasantha, On a problem of the group ring Z_2S_3 , Univ.Sci.Phy.Sci. Vol.6, 147, (1994).
30. W.B. Vasantha, I^* semigroups, The Maths Education, Vol.XXVII, 30-31, (1994).
31. W.B. Vasantha, Coloring of group rings, J.Inst., Math. & Comp.Sci. Vol.7, 35-37, (1994).
32. W.B. Vasantha, n-ideal near rings, J. of Math. Res. and Exposition Vol.14, 107-108, (1994), China.
33. W.B. Vasantha, Right multiplication ideals in rings, Opuscula Math. Vol.15, 19-21, (1995) Poland.
34. W.B. Vasantha, On multi differentiation of decimal and fractional calculus the Mathematics Education, Vol.XXVII, 220-225, (1994).
35. W.B. Vasantha, On a new type of product rings, Ultra Scientist of Phy.Sci. Vol.6, 270-271, (1994).

36. W.B. Vasantha, A Note on the modular loop ring of finite loop, *Opuscula Math.* Vol.15, 5-9, (1995) Poland.
37. W.B. Vasantha, On SPI Semigroup rings, *Proc. Pakistan Acad.* Vol.31, 40-50, (1994) Pakistan.
38. W.B. Vasantha, On Decimal and Fractional calculus *Ult.Sci. of Phy.Sci.* Vol.6, 283-285 (1994).
39. W.B. Vasantha, on Weakly Boolean group rings, *Libertas Mathematics*, Vol.XIV, 111-113, (1994) USA.
40. W.B. Vasantha, supermodular subgroups in finite groups *Rostock Math. Koll.* Vol.47, 27-30, (1994) Germany.
41. W.B. Vasantha, The Units of semigroup seminear rings, *Opuscula Math.* Vol.15, 40-41, (1995) Poland.
42. W.B. Vasantha, f-semigroup rings, *The Mathematics Education* Vol.XXVIII, 162-164, (1994).
43. W.B. Vasantha, On the ring $(R \times G \times S)$, *J. of Xonjiang Univ. of natural Sciences* Vol.11, 33-34, (1994) China.
44. W.B. Vasantha, A note on semigroup rings which are pre-P- rings, *Kyung pook Math. J.*Vol.34, 223-225, (1995) Korea.
45. W.B. Vasantha, On strictly right loop rings, *J. of Harbin Inst. of Sci. & Tech.* Vol.18, No.3, 116-118 (1994) China.
46. W.B. Vasantha and N. Suresh Babu, The relation between minimum distance and covering radius of indecomposable binary cyclic codes over 2 groups, *Math Today (XII)* (1994).
47. R. Rukmani and R. Usha, Arbitrary Squeeze Flow Between Two Disks, *International Journal of Mathematics and Mathematical Sciences*, Vol.17, pp. 779-782, (1994).
48. R. Usha and Rukmani Sridharan, On the Axisymmetric motion of a liquid film on an unsteady stretching surface. *Transaction of the ASME - Journal of Fluids Engineering* (1995).
49. R. Usha, Creep flow with concentric permeable spheres in relative motion, *ZAMN*, Vol.75, pp.3, (1995).

4.10 Mechanical Engineering Department

4.10.1 Introduction

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

Heat Transfer and Thermal Power.

Hydro Turbo Machines

Internal Combustion Engines

Machine Elements

Manufacturing Engineering

Mechanical Handling

Precision Engineering and Instrumentation

Refrigeration and Air Conditioning

Thermal Turbo Machines

Thermodynamics and Combustion

4.10.2. New Courses Introduced

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

Sl.No.	Course No.	Title	Faculty
1.	ME402	Combustion Engineering	Dr. USP Shet / Dr. T.Sundararajan
2.	ME781	Combustion Theory & Applications	Dr. R. Natarajan/K. Ramamurthi(ISRO)

4.10.3. Details of Faculty

Name and Qualifications

Major area of specialization

Professors

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

Bhaskaran K.A., Ph.D.(IIT Madras)

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

Gopalakrishnan K.V., Ph.D.(IIT Madras)

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

Krishnaiah Chetty O.V., Ph.D(IIT Madras)

Fluidized Bed Combustion and Heat Transfer
Thermodynamics, Combustion and Propulsion,
Kinetic Modelling of Combustion Reactions, Shock
Tube Studies, Soot and Pollution Control

I.C.Engines & Gas Turbines

I.C.Engines

Machine Design, Friction and Wear Powder
Metallurgy

Manufacturing Engg., Metal Removal Process

Name and Qualifications	Major area of specialization
Krishnamurthy R., Ph.D.(IIT Madras)	Manufacturing Engg., Tribology Ceramic and composite materials
Krishna Sastri V.M., Ph.D.(Delaware)	Heat Transfer and Thermal Engineering
Lakshminarayana K., Ph.D.(IIT Madras)	Mechanisms & Transmissions Design Optimization, Machine Design
Madhusudana Rao M., Ph.D.(IIT Madras)	Design and Development of Mechanical Handling Equipment
Nagalingam B., Ph.D.(IIT Madras)	I.C.Engines
Nagarajan T., Ph.D.(IIT Madras)	Precision Engg. & Robotics
Natarajan R., Ph.D.(Waterloo)[Head]	Hetrogeneous Combustion, Energy Conservation, Rocket and Ramjet Combustion, Thermodynamics, Analysis of Energy Systems
Parameswaran M.A.Ph.D.(IIT Madras)	Design and Development of Mechanical Handling equipment
Philip P.K., Ph.D.(IIT Madras)	Manufacturing Engg., CAD, CAM, Material Removal Process
Premananda Shet U.S., Ph.D.(IIT Madras)	Combustion and Propulsion, Thermodynamics, Turbulent Premixed Combustion, Swirl Combustion, Laser Doppler Anemometry
Radhakrishnan V., Ph.D.(IIT Madras)	Manufacturing Engg., Metrology
Raman R., Ph.D.(IIT Madras)	Precision Engg.
Seetharamu K.N., Ph.D.(IIT Madras)	Heat transfer, Fluid flow
Shunmugam M.S., Ph.D.(IIT Madras)	Manufacturing Engg., Metrology and Quality Control, CAM
Sriramulu V., Ph.D.(IIT Madras)	Thermodynamics, Combustion and Propulsion Supersonic
Srinivasa Rao P., Ph.D.(IIT Madras)	I.C.Engines
Srinivasa Murthy S., Ph.D.(IIT Madras)	Refrigeration & Airconditioning Thermal Energy Conservation Food Processing and Preservation Solar Energy Utilisation Cryogenic Engineering
Veluswami M.A., Ph.D.(MIT USA)	Solid Mechanics, Vibrations, Design of Pressure Vessels and Piping and Optimization Tech. in Mech. Design
Venkatesh A., Ph.D.(IIT Madras)	Thermodynamics, Thermal Appl. of Solar Energy
Venkateshan S.P., Ph.D.(IISc.)	Heat Transfer and Instrumentation
Vijay R Raghavan, Ph.D.(IIT Madras)	Heat Transfer
Associate Professors	
Balabaskaran V., Ph.D.(IIT Madras)	Hydroturbo machines
Kumaraswamy S., Ph.D.(IIT Madras)	Hydroturbomachines
Pramod S.Mehta, Ph.D.(Loughborough UK)	I.C.Engines
Singaperumal M., Ph.D.(IIT Madras)	Fluid Power, Precision Engg.
Siva Prasad N., Ph.D.(IIT Madras)	Finite Element analysis, Computer Aided Design
Srinivasa Y.G., Ph.D.(IIT Madras)	Instrumentation and Control
Sundararajan T., Ph.D.(Pennsylvania)	Spray Combustion, Mixing & Combustion of High Speed Jets, Computational Fluid Dynamics & Heat Transfer, Thermodynamics
Assistant Professors	
Gopalan K.N., Ph.D.(IIT Madras)	Analysis, Simulation and Dynamics
Govindamallan K.R., Ph.D.(IIT Madras)	I.C.Engines

Name and Qualifications

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

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

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

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

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

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

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

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

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

Padiyar K.S., M.Tech.(IIT Kharagpur)

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

Ramakoteswara Rao K., Ph.D.(IIT Madras)

Ramalingeshwara Rao, M.Tech.(IIT Madras)

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

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

Sitaram N., Ph.D.(Pennsylvania State)

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

Prakash M. Maiya, Ph.D.(IIT Bombay)

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

Chief Design Engineer

Chennabasvan T.S., M.Sc.Engg.(Aston)

Senior Design Engineer

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

Senior Scientific Officer

Boopathy S., M.E.(Bharathiar)

Senior Maintenance Engineer

Arun A., B.E.(Madras)

Major area of specialization

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

Machine Design, FEM analysis, CAD Chemical Machiavelli Design

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

Machine Design, Failure Analysis Gears

Manufacturing Engineering

Surface Engg Wear & Wear control, Stress Analysis

Refrigeration and Airconditioning Thermal applications of Solar Energy Cryogenic Engineering

Machine Design, Vibration & stressanalysis

Surface Topography, Manuf. Method

Thermodynamics, Combustion, Ramjet Propulsion, Design & Development of Gas Burners, Utilization of Solar Energy.

Power Plant Engineering,

Design and Development of Mechanical Handling Equipment

Instrumentation and Control

Metrology, CAI, Sensors, Manufacturing Engg., Quality Control

CIM, CNC, PLC, Sensors, Unconventional Machining, Lasers

Thermal Turbomachines (Bounadary Layer Studies, CFD, Tip Clearance Flows)

Metal cutting, CAD, Condition Monitoring

Thermal Sciences

Refrigeration Cryogenic Engineering

Machine Design

Design of Mechanical Machines, Design of Manufacture, Jigs and fixtures/Powder Met. parts

Manufacturing Engg., Automation

Refrigeration Engineering

4.10.4. Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D.	15	-	09	2	10	-	14	-	11	1	059	3	062
M.S.	12	-	16	-	06	-	1	-	-	-	035	-	035
M.Tech.	83	3	73	-	-	-	-	-	-	-	156	3	159
B.Tech.	83	1	83	2	78	1	76	1	-	-	320	5	325
Total	193	4	181	4	94	1	91	1	11	1	570	11	581

4.10.5. Number of Scholarship/Fellowship holders

Programme	Institute	Others	Total
Ph.D.	37	8 (QIP)	45
M.S.	33	-	33
M.Tech.	107	14 (QIP)	121
Total	177	22	199

4.10.6. No. of Degrees Awarded

Programme	Number
Ph.D.	16
M.S.	11
M.Tech.	55
B.Tech.	75
Total	157

4.10.7. Instruments/Equipments Designed and Developed

1. Set up for testing Instrument Cooling fans.
2. Pulse-Jet-Capacitance Measuring Instrument for on-line Roughness Measurement (Equipment developed and patented) Prof.V.Radhakrishnan.
3. Fluidised Bed Polishing Device - Prof.V.Radhakrishnan.
4. 150 mm Schlieren Systems - Prof R.Natarajan, Dr.D.K.Sharma & Prof.USP. Shet.

4.10.8. New Facilities Added and Major Equipment Procured

Purchased one PC AT 486, for use in M.H.Lab. Differential Pressure Transducer with Micro Processor Based Digital Pressure Indicator/Transmitter - Rs.42,000/- in HTTP Lab

AT 386 Computer - Rs.56,000/- in HTTP Lab

PC based Image Processing Equipment, Bench mark Model, Rs. 3.66 lakhs.

PC based Data Acquisition System for analysing Turbulent Jet Flames - about Rs. 1 lakh.

Climatic chamber: Temp. -40 to 180 xC; RH 10 to 90 %

Online Density meter

Refrigerant Compressor Test Facility

Purchase of Thyristor Control Panels for operating all our D.C drive units

Automated Assembly System

A computerised test system for centrifugal pumps has been procured and commissioned under a MHRD grant for modernisation of laboratories.

Two diskless nodes are added to the existing LAN system to provide better computing facilities to the students.

4.10.9. Short-Term Courses/Workshos Organised

SI.No.	Faculty	Title	Date
1.	Prof.K.N. Seetharamu	Pre-processing for Finite Difference and Finite Element Applications - Automatic and Adaptive Mesh Generation	July 4-9-94
2.	Dr.K.N.Seetharamu Dr.T.Sundararajan	A one-week QIP/CEP course was organised on "Automatic & Adaptive Mesh Generation for Finite Difference and Finite Element Applications"	July 4-9- 1994
3.	Dr.N.Siva Prasad	National Seminar on "Industrial Problems in Design Engineering" Org. Secretary	June 25 1994
4.	Dr.N.Siva Prasad	Auto CAD Training Program for IIT Draughtsman (Coordinator)	12.5.94 to 28.7.94
5.	M.Singaperumal	FPSI Workshop on " Condition Monitoring in Fluid Power Systems"	1994.
6.	M.Singaperumal	Hindustan Shipyard Ltd. Visakhapatnam, In-house Training Program on Control Systems	1994
7.	Prof.R.Natarajan	Indo - UK workshop on Technology developments towards environmentally clean spraying systems, IIT Madras	Nov 16-19,1994
8.	Prof.R.Natarajan	Workshop on Strategies for Energy Conservation, IIT Madras	Oct. 29 1994

4.10.10. Short-Term Courses/Workshops Attended by the Faculty

S.No.	Name of Faculty	Title	Period/Duration
1.	Dr.M.Govardhan	XXI National Conference on Fluid Mechanics & Fluid Machinery	Dec. 94
2.	Prof.V.Radhakrishnan	Int.Electromagnetic Symp. Japan	Nov. 94
3.	Prof.V.Radhakrishnan	16th AIMTDR Conf.	Dec.94
4.	Prof.P.K.Philip	16th AIMTDR Conf.	Dec.94
5.	Prof.P.K.Philip	AMSE Int. Conf.	Nov.94
6.	Prof.M.S.Shunmugam	16th AIMTDR Conf.	Dec.94
7.	Prof.R.Krishnamurthy	16th AIMTDR Conf.	Dec.94
8.	Dr.B.Ramamoorthy	16th AIMTDR Conf.	Dec.94
9.	Dr.B.Ramamoorthy	AMSE Int. Conf.	Nov.94
10.	Dr.L.Vijayaraghavan	16th AIMTDR Conf.	Dec.94
11.	Dr.N.Ramesh Babu	16th AIMTDR Conf.	Dec.94
12.	Mr.S.Boopathy	16th AIMTDR Conf.	Dec.94

4.10.11. Special Lectures Delivered

SI.No.	Name of Faculty	Topic of Lecture	Delivered at	Date
1.	M.P.Maiya	Basics of Airconditioning	ISTE-CEP course	22.6.94
2.	M.P.Maiya	Airconditioning:Load Estimation	Planning & Design of Building	24.6.94

Sl.No.	Name of Faculty	Topic of Lecture	Delivered at	Date
3.	M.P.Maiya	Airconditioning Services Systems	Dept. of Civil Engg. IIT Madras	20th June to 1st July 1994
4.	Prof.K.N.Seetharamu	Conduction and Radiation Interaction	ISRO Bangalore	July & Aug.94
5.	Dr.K.Lakshminarayana	Gear	Rane Madras	August'94
6.	Dr.K.Lakshminarayana	Adv. Mechanism and Design	IISc. Bangalore	-
7.	Dr.M.A.Veluswami	Design of Pressure Vessels and Piping	M.R.L.Madras	-
8.	Dr.M.A.Veluswami	Design of Pressure Vessels & Piping	BHEL Tiruchy	-
9.	Dr.M.A.Veluswami	Design of Pressure Vessels & Piping	K.C.P Ltd. Madras	-
10.	Dr.M.A.Veluswami	Optimization Techniques in Design	Brakes India Ltd. Madras	-
11.	Dr.Pramod.S. Mehta	Modelling of Engine Processes	Engine Dev. Directorate RDSO, Lucknow	4-7 July 94
12.	Dr.S.Padmanabhan	Mechanical design as a job opportunity	PEIL Seminar Hall	6.4.95
13.	Dr.M.Shunmugam	Performance of CNC Machines	BIET Devangiri	Dec.94
14.	Dr.M.Shunmugam	Robotic Vision	MIT Madras	Feb.95
15.	Dr.M.Shunmugam	Performance of CNC Machines Evaluation and Enhancement aspect.	Anna Univ. Madras	March 1995
16.	Dr.S. Kumaraswamy	Selection of pumps for water supply	Dept. of Civil IIT Madras	21.6.94
17.	Dr.S. Kumaraswamy	Pumps	MRL Madras	11-12 July '94
18.	Dr.S. Kumaraswamy	Application of pumps	Indian water works, Water works Association Coimbatore	7.3.95

4.10.12. Visits Abroad

No.	Name of Faculty	Country Visited	Date	Purpose of visit
1.	Prof.V.M.K.Sastri	USA USA Hawaii	June 93-Oct.94 March 19-24 1995	Visiting Faculty To attend 4th ASME/JSME Thermal Engg. Conference
2.	Prof.Ajit Kumar Kolar	New York	May-June 94	For Project Discussion
3.	Prof.S.P.Venkateshan	USA	Jan-June 1994	Conducted Research at Jet Propulsion Lab. Los Angles
4.	Prof.Vijay R Raghavan	Germany	May-July 94	Research
5.	Prof.A.Venkatesh	Germany	Aug-Oct. 94	DAAD Invitation Programme
6.	Dr.K. Gopinath	USA	July 94	Paper Presentation
7.	Dr.B.Nagalingam	Holland	April-June 94	TNO Research Fellow at Vehicle Res. Inst. Holland

No.	Name of Faculty	Country Visited	Date	Purpose of visit
8.	Dr.V.Radhakrishnan	Hong Kong Japan	16 Aug. 94 9-11 Nov. 94	IEE Asia Region Meeting Nagano Magel 94 Magneto Elec. Int.Symp.
9.	Dr.P.K.Philip	USA	Nov. 94	AMSE Int. Conf.
10.	Dr.R.Krishna Kumar	USA	Feb 28-Dec.15 1994	Indo-US Exchange visitors programme
11.	Dr.B.Ramamoorthy	USA	Nov. 94	ASME Int. Conf.
12.	Dr.B.Ramamoorthy	Germany	Nov. 94	GTZ Project
13.	Dr.S.Srinivasa Murthy	Germany	May-July 94	Attended Int. Conf. at Hannover & Indo-German Project at Univ. of Karlsruhe
14.	Dr.S.Srinivasa Murthy	Malaysia	Dec. 94	Univ. of Malaya; Universiti Teknologi, Malaysia Johor Bahru; Lectures

4.10.13. Distinguished Visitors to the Department

S.No.	Name of the Visitor and Occupation	Date of Visit	Purpose of Visit
1.	Prof.D.P.Atherton	Aug. 94	Discussion
2.	Prof.Dr.-Ing.M.Bantel Fachhochschule Frankfurt AM Main Germany	Sept. 94	Discussion
3.	Prof.Yukata Tsuji Head Dept. of Mech.Engg. Osaka Univ. Japan	Jan. 95	Delivered Lectures and Discussed research programs carried out in IITM and Osaka Univ.
4.	Dr.Ing.H.Ruscheweyh	Dec. 94	Discussion
5.	Dr.Herbert Heitland (Former Prof. IITM & TH Aachen Germany Former Chief R&D Volkswagen)	Sept. 94	Delivered a series of lectures on recent trends in Automotive Engine Design.
6.	Dr.Ronald Pein (DLR Space Propulsion Lab. Germany)	Aug. 94	Discussion
7.	Prof.Heitland Aachen Tech Univ. Germany	Dec. 94	Lectures
8.	Dr.V.Prakash Watson School USA	17.1.95	Mechanical aspects of electronic pakaging
9.	Dr.Vilor L.Zakovarotny Dr.Rubynov VV Don State Tech. Univ. Russia	12.1.95	Dynamics, Diagnostics and control of process in machine tools
10.	Dr.V.C.Venkatesh GINTIC Institute Mfg. Singapore	5.12.94	Mfr. of spherical and aspherical surfaces on plastics of glass & ceramics

S.No.	Name of the Visitor and Occupation	Date of Visit	Purpose of Visit
11.	Dr.Y.Narahari IISc. Bangalore	24.11.94	Design and analysis of scheduling policies in semiconductor Mfg.system
12.	Mr.V.Amudachary Ashok Leyland	12.9.94	TQM
13.	Dr.H.Chandrasekharan Instt.fur Metallforming Sweden	19.8.94	Machinibility of high alloy steels
14.	Dr.V.C.Venkatesh Tennessee Tech. Univ. USA	17.6.94	Processing of silicon lenses mirrors and surfaces
15.	Prof.Dr.-Ing.H.Ruscheweyh Aachen Univ. Germany	17.1.95	Discussion

4.10.14. Sponsored Projects (Under Progress)

SI.No.	Title	Period	Funding Agency	Amounts (Lakhs)	Coordinator(s)
1.	Development of pumpless solar absorption refrigeration system	2 years	MNES	11.47	Dr.M.P.Maiya Prof.S.Srinivasa Murthy
2.	Technology Development Mission on high temperature heat pumps	3 years	Plng. Commn.	277.00	Faculty of the Laboratory
3.	Development of continuous solar refrigerator with transfer tank	3 years	CSIR	4.52	Dr.A.Mani Prof.S.Srinivasa Murthy
4.	Alternatives to CFCs for refrigeration applications - Energy & Environmental aspects (Indo-German)	3 years	MHRD/BMF	5.00	Prof.S.Srinivasa Murthy Dr.A.R.Balakrishnan
5.	Design & Development of an environmental chamber (Modernisation)	3 years	MHRD	15.00	Dr.A.Mani Prof.S.Srinivasa Murthy
6.	Development & Testing of Compact Cryogenic Heat Exchangers	2 years	DST	7.50	Dr.G.Venkatarathnam Prof.S.Srinivasa Murthy
7.	Development of Perforated Plate Matrix Heat Exchangers	2 years	DST	1.71	Dr.G.Venkatarathnam
8.	3-D Conduction Code for Gas Turbine Blade Cooling	1.2.90	ARDB	6.75	Prof.K.N. Seetharamu Prof.P.A.Aswatha Narayana
9.	Bipolar and Mos Devices simulator (BIMODES)	Jan 93-Dec.96	DOE	21.25	Prof.K.N. Seetharamu Dr.K.N.Bhat (EE)
10.	Development of a software for spacecraft thermal analysis using FEM	1994-97	ISRO	4.62	Prof.K.N.Seetharamu Prof.P.A.Aswatha Narayana
11.	KBES for Finite Element Analysis for Engines Design	Jan 92-Dec.95	DST	7.18	Prof.K.N.Seetharamu Prof.C.S.Krishnamoorthy (CE)

SI.No.	Title	Period	Funding Agency	Amounts (Lakhs)	Coordinator(s)
12.	Modernisation of Undergraduate Laboratory	1993-95	MHRD	15.00	Prof.S.P.Venkateshan Dr.Y.G.Srinivasa
13.	150 TPD Pressurized Fluidized Bed Coal Gasification - Demonstration - Development Plant	1.6.92-30.6.95	BHEL Hyderabad	12.00	Prof.Ajit Kumar Kolar Prof.V.M.K.Sastri Dr.K.Krishnaiah (CH)
14.	Application of vision system for surface and dimensional inspection	3 years	CSIR	6.87	Prof.V.Radhakrishnan Dr.B.Ramamoorthy
15.	Computer Aided Design & Mfr. of Dies	3 years	DST	17.584	Prof.V.Radhakrishnan Dr.R.Krishna Kumar
16.	Computer Assisted Flexible Automated Assembly systems	2 years	MHRD	15.00	Dr.V.Radhakrishnan
17.	Development of object oriented simulation software for automated mfg. systems	2 years	DST	7.50	Dr.O.V.Krishnaiah Chetty Mr.S.Boopathy
18.	Thermal studies in plasma spraying	2 years	MHRD	-	Dr.R.Krishnamurthy Dr.MM Mayuram
19.	Development of interactive computer based Infn. and guidance package for educational and employment planning	-	MHRD	10.00	Dr.M.S.Shunmugam
20.	Development of reciprocating gait orthosis for paraplegics		Min. of Welfare	7.76	Dr.M.S.Shunmugam
21.	Development of under graduate lab. in Mech. Engg.	3 years	MHRD	15.00	Dr.Y.G. Srinivasa Dr.S.P.Venkatesan
22.	Studies on the mixing characteristics of flow in a jet pump handling slurry		NIOT	36.00	
23.	Supersonic combustion of Hydrogen jets in air flow	2 years	ISRO	5.56	Dr. UPS Shet Dr.T.Sundarajan
24.	Investigations of steady and Transient injection and mixing in liquid rocket combusters	3 years	ISRO	7.80	Dr.R.Natarajan Dr.T.Sundarajan
25.	Ignition of metallised propellants	3 years	ISRO	4.95	Dr.K.A. Bhaskaran
26.	Studies on advanced propulsion systems	4 years	DRDL	19.98	Dr.Job Kurian (AE) Dr.V.Sriramulu
27.	Design and development of a Schlieren systems for LPSC	1 year	ARDB	1.60	Prof.R.Natarajan Prof.USP Shet Dr.D.K.Sharma
28.	Inlet distortion in compressors	4 years	ARDB	9.35	Prof.N.Venkatrayulu Dr.M.Govardhan
29.	Tip clearance flow in compressors	3 years	ARDB	5.00	Prof.N.Venkatrayulu Dr.N.Sitaram

Sl.No.	Title	Period	Funding Agency	Amounts (Lakhs)	Coordinator(s)
30.	LPCVD Polycrystalline silicon mosfet technology for 3D integration	4 years	DOE	47.00	Dr.K.Gopinatha Dr.K.N.Bhat
31.	Evaluation of Tribological characteristics of sprayed ceramics coatings	3 years	MHRD	8.00	Dr.MM. Mayuram Dr.R.Krishnamurthy Dr.K.Narayanaswamy
32.	Development of an Interactive computer based information and guidance package for educational and employment planning	3.1/2 years	MHRD	10.00	Dr.V.Jayaprakash Dr.M.S.Shanmugam
33.	Technology Dev. Mission project on fuel efficient engines		Planning & Commission Govt. of India	92.00	Dr.K.V.Gopalakrishnan
34.	Experimental study on an axial flow fully reversible turbomachine	5 years	DST	10.20	Dr.V.Balabaskam Dr.H.C.Radhakrishna
35.	Development of a slurry pumping system using jet pumps	2 years	NIOT	43.67	Dr.S.Kumaraswamy/MMR
36.	Turbulence effects in spray combustion	4 years	ISRO-IITM	7.30	Prof.R. Natarajan
37.	Investigations of steady and transient injection and mixing liquid rocket combustors	3 years	ISRO-IITM	7.612	Prof.R. Natarajan
38.	Investigations of Multi-phase jet mixing and combustion in a dump combustor	3 years	ARDB Propulsion panel project	8.03	Prof.R. Natarajan
39.	Numerical prediction of Two Dimensional reacting flows with application to Ram Jet Combustion	4 years	ARDB Propulsion panel project	9.90	Prof.R. Natarajan
40.	Numerical prediction of 2D reacting flows with application	5 years	ARDB	5.796	Dr.R. Natarajan Dr.V. Ganesan

4.10.15. Major Consultancy Assignments

S.No.	Title	Organisation	Amount in Rs.
1.	Software Development for Steering Gear Test Rig	Rane Madras	34,500
2.	Software development for Gear roll testing	Rane Madras	50,000
3.	Testing of Axial Piston Pumps	Iyappan Engg. Industries Ltd. Madras.	12,000
4.	Development of a General Software for Clients	Command Mart Ltd. Madras	4,50,000
5.	Upgradation of Carl SCHENCK Machine	Super Shock Absorbers, Hyderabad	4,50,000
6.	Development of code of heat transfer	Defence	50,000
7.	Development of code for flow and heat transfer	Defence	75,000

S.No.	Title	Organisation	Amount in Rs.
8.	Fuel analysis of tyre curing mould	L&T Mcneil	40,000
9.	Energy Conservation in tyre curing presses	L&T Mcneil	12,000
10.	Common Effluent Treatment Plant	Tamil Nadu Pollution Control Board	-
11.	Graphite Benefication Plant	Tamil Nadu Minerals	-
12.	Experimental study of steel & aluminium platen temperatures for the tyre presses	L&T McNeil	40,000
13.	Design & Development of a test-rig for refrigerant compressor testing (I & II phases completed; III Phase on)	ICF Madras	1,75,000
14.	Analysis and design of solar evaporation ponds for tannery effluent treatment (ongoing)	TALCO Madras	45,000
15.	Development of absorption refrigeration systems with environmentally safe working fluids (Ongoing)	Sterling Strips Ltd. Bombay	1,50,000
16.	Development of 5 MVA Superconducting Generator (Ongoing)	BHEL Hyderabad Corp.R&D	2,50,000
17.	Thermal Design of Transport Cryogenic Containers	Halli- burton Oil Fields	50,000
18.	Design and Calibration of 2-D probes	BHEL Hyderabad	40,000
19.	Design and fabrication	BHEL Hyderabad	50,000
20.	Testing of Centrifugal Fans	Andrew Yule Co. Calcutta	50,000
21.	Testing of Radiator Fan Assembly	Lucas TVS Madras	5,000
22.	Testing of Axial Cooling Fan	R.K. Industries Madras	3,000
23.	Testing of Centrifugal Fan	Industrial Fans Madras	3,500
24.	Rolling contact fatigue of ball bearing steels	TISCO	1,97,000
25.	Bellow Forming Machine	IMAP	1,12,000
26.	Technical Evaluation of automatic bagging m/c	CBI	28,000
27.	Failure Analysis of mud gun bearing	USHA ISPET	25,000
28.	Calibration of Torque wrenches	ABAN LLOYD	70,000
29.	Analysis of the process of Combustion of pulverised Coal utility under furnaces	BHEL Hyderabad	1,500,000
30.	Automation of 35 relay	OEN India Ltd.Cochin	15,000
31.	Development of twin spindle T slot grinding with CNC	Guindy Machine Tool Ltd. Madras	7,50,000
32.	Development of pilot prototype valve	Shreyas Instruments P.Ltd. Madras	25,000
33.	CNC machining of acrylic sheets	Benchmark Electronic Systems P Ltd	25,000
34.	Calibration of CMM with laser interferometer	TAFE Madras	20,000
35.	Measurements	Esquire Engineers Consultant	15,000
36.	Retainer Consultancy	Shriram Engg.Madras	24,000
37.	Consultancy for CET Plants (a)Amburtec (b)Pertec (c)Vanitec (d)Ranitec(d)Tritec	TALCO Madras	1% Plant of cost

S.No.	Title	Organisation	Amount in Rs.
38.	Consultancy for CET Projects at (a) SIDCO Ranipet (b) Erode (c) Kodaikanal (d) Melpudupet (e) Chettithangal (f) Tiruppur (g) Visharam Ranipet (h) Pammal-Pallavaram	Pollution Control Board Madras	1% of project cost
39.	Consultancy for CET Projects at a) Ayyampet -Muthialpet b) Perumalpet c) Vaniyambadi d) Dinidigul e) Amaravathi (Karur) f) Andankoil (Karur) g) Vaniyambadi - VETCO h) Sukkaliyur (Karur) i) Karur Taluk j) Tiruvai (Karur) k) Karur Vanchi	Pollution Control Board Madras	1% of project cost
40.	TNPCB Projects	1. M/s Pudur Tanners Effluent Treatment Control Systems Ltd. 2. M/s Mitta Efflu Treat (P) Ltd 3. M/s SIPCOT and SIDCO Phase II Entrepreneur Finished Leather Treatment Company (P) Ltd	-
41.	Inspection of Pump set Installation at Coimbatore and Salem	TWAD Board Project	0.04

4.10.16. Honours and Awards

Sl.No.	Name of Faculty	Honours/Awards	Purpose
1.	Prof.K.N.Seetharamu	M.G.Deshpande Memorial Prize	Best Paper
2.	Prof.V.Ganesan	Awarded Certificate of Merit	Best Paper
3.	Prof.R.Krishnamurthy	Invited Member	Int. Advisory Committee 3rd Int.Conf. on Computer Integrated Mfg.(ICCIM) Singapore 1995
4.	Prof.R.Natarajan	Elected Fellow	Indian National Academy of Engineering
5.	Prof.R.Natarajan	Sir Rajendra Nath Mukerjee Memorial Prize	Best Paper
6.	Prof.R.Natarajan	ISTE Baroda Chapter Award	Best Paper

4.10.17. Books/Monographs Published

S.No.	Name of Faculty	Title	Publisher
1.	Dr.S.Srinivasa Murthy A.R.Balakrishnan	Heat and Mass Transfer Proc. of 12th ASME/ISHMT HMTC	Tata McGraw Hill New Delhi
2.	Dr.S.Srinivasa Murthy L.R.Oellrich	Alternatives to CFC's for Refrigeration Applications	Scientific Series of the International Bureau, Vol.25, Julich Germany
3..	Dr. V.Ganesan	I.C. Engines	Tata McGraw Hill
4.	Dr.R.Natarajan Dr.M.Singaperumal .B.S.Prabhu	Plant Engineering and Management - Proc. Int.Convention of Plant Engineers, TEPEM 94 Madras	Tata McGraw Hill
5.	S.D.Kalandar Saheb	Engineering Design for Manufacture	-
6.	Dr.R.Krishnamurthy	Contributed a chapter in International Book on Advanced Ceramic Cutting Tool	Noya Publication USA
7.	Dr.R.Krishnamurthy	Contributed a chapter in International Book on Advanced Cutting Tools for Machining Application I - Transtech Publication, Switzerland	Centre for Continuing Education, IIT Madras, Jan. 1995.

4.10.18. Research Publications

1. Prof.M.Madhusudana Rao, Prof.M.A.Parameswaran, Ch.Sathaiah," Effect of Moisture Content on flow of Bulk Solids through Chutes", Bulk Solids Handling, Vol.2, Jan.94/March 94, Vol.1, pp.71-73.
2. Dr.K.Ramakoteswara Rao, Avijit Chattopadhyay," On the Classification of Bulk Solids", Bulk Solids Handling, Vol.14, No.2, 1994.
3. Balaji, C. and Venkateshan, S.P., "Combined Surface Radiation and Free Convection in Tall Cavities", J Thermophys. and Heat Transfer, Vol.6, No. 2, pp 313-326, June 1994.
4. Srinivas Rao, M.S.S. and Sastri, V.M.K., "Natural Convection Heat Transfer in Staggered Vertical Channels", Computer Methods in Applied Mechanics and Engineering, Vol. 113, pp 263-269, 1994
5. Nag, A., Sarkar, A. and Sastri, V.M.K., "On the Effect of Thick Horizontal Partial Partition Attached to One of the Active Walls of a Differentially Heated Square Cavity", Numerical Heat Transfer, Vol.25, pp.611-625, 1994
6. Balaji, C. and Venkateshan, S.P., "Correlation for Free Convection and Surface Radiation in a Square Cavity", Int. J. of Heat Fluid Flow, Vol. 15, No. 3, pp 249-251, June 1994.
7. Balaji, C. and Venkateshan, S.P., "Interaction of Radiation with Free Convection in an Open Cavity, Int.J Heat Fluid Flow, Vol. 15, No. 4, pp 317-324, August 1994.
8. Sunil Kumar, S. and Venkateshan, S.P., "Optimized Tubular Radiator with Annular Fins on a Non-isothermal Base", Int. J Heat Fluid Flow, Vol. 15, No. 5, pp 399-410, October 1994.

9. Balasundar, P. and Sastri, V.M.K., "Natural Convection Heat Transfer in Overlapping Discrete Plate Arrays, International Journal of Mechanical Sciences, Vol.37, No. 1, pp 107-111, 1994
10. Krishna Satya Sai, B.V., Seetharamu, K.N. and Aswatha Narayana, P.A., "Solution of Transient Laminar Natural Convection in a Square Cavity by an Explicit Finite Element Scheme", Numerical Heat Transfer, Part A, Vol.25(2), No. 1, pp 593-609, 1994
11. Dr.K.Ramakoteswara Rao, B.Anil," Development of a Machine for producing continuous helicoid out of metal strips", presented in AIMTDR conference held at Trivandrum, during December 1994
12. Matcharajan, B, and Seetharamu, K.N., "Thermal Transients of a Cooled Gas Turbine Nozzle Guide Vane", Proc. 5th Int. Symposium on Transport Phenomena and Dynamics of Rotating Machinery (ISROMAC-5), Hawaii, USA, May 1994
13. Krishna Satya Sai, B.V., Seetharamu, K.N., Aswatha Narayana, P.A. and Reddy, J.N., "Non-Darcian Natural Convection in a Porous Cavity with Constant Heat Flux on One Vertical Wall", Int. Heat Transfer Conference, Brighton, U.K. Vol. 7, 16-NC-28, pp 155-160, August 1994
14. Patnaik, B.S.V.P., Aswatha Narayana, P.A and Seetharamu, K.N., "Flow Past Bluff Bodies with Suppression of Flow Induced Vibration", 9th International Conference on Wind Engineering, Vol. 2, New Delhi, pp 98-99, January 1995
15. Patnaik, B.S.V.P., Aswatha Narayana, P.A and Seetharamu, K.N., "Finite Element Analysis of Flow Past Bluff Bodies with Heat Transfer", First Asian Computational Fluid Dynamics Conference, Hong Kong, January 1995.
16. Patnaik, B.V.S.P., Aswatha Narayana, P.A and Seetharamu, K.N., "Numerical Simulation of Vortex Shedding Behind Bluff Bodies", 21st National Conference on Fluid Mechanics and Fluid Power, Hyderabad pp CF 2.1 to 2.6, 1994
17. Patnaik, B.V.S.P., Aswatha Narayana, P.A and Seetharamu, K.N., "Finite Element Simulation of Flow Past a Cylinder with Integral Wake Splatter", 29th Indian Society of Theoretical and Applied Mechanics Conference, Visakapatnam, MF15, December 1994.
18. Sriram, N., Seetharamu, K.N. and Natarajan, R., "Transient Analysis of Interference Effects in Three Sphere Systems during Forced Convection", Proceedings of the Second International Conference, Air Breathing Engine and Aerospace Propulsion, Vol. 2, Tiruvannandapuram, 15-17 December 1994.
19. Pandey,P.K., Mahalakshmi,N.V., Shet, U.S.P., Ganesan, V and Syed Aga Jan.: Numerical Modelling of Turbulent Flow Through Annular Diffusers, Journal of Institute of Engineers, Vol.75 August 1994, pp 41-48.
20. A.Venkatesh,'Experimental Observations on a Continuous Flow Type Domestic Water Heater', J.Energy Conversion and Management, 35 (12), p. 1041, 1994.
21. K.Sumathy, A.Venkatesh and V.Sriramulu,'Effect of Discharge Head on the Performance of a Solar Water Pump', International Journal of Energy Research, 18, p.623, 1994.
22. K.Sumathy, A.Venkatesh and V.Sriramulu, 'Heat Transfer Analysis of a Flat Plate Collector Employed in a Solar Thermal Pump', International Journal of ENERGY, 19, p. 983, 1994.
23. K.Sumathy, A.Venkatesh and V.Sriramulu, Thermodynamic Analysis of a Solar Water Pump Renewable Energy, 5, part III, p.1942, 1994.
24. S.R.Shankapaland V.Sriramulu, 'Studies on Combustion of ** Pulverised Coconut Shell Water Slurries', Int. journal of ** Energy Research, (Accepted for Publication), 1994.

25. M.Manjunath, A.Tripathi, T. Sundararajan and R.P. Chhabra, Numerical Simulation of the drag on a Swarm of Bubbles, *Int. J. Eng. Sci.*, V.32, pp.927-934, June 1994.
26. A.Tripathi, R.P. Chhabra and T. Sundararajan, Power Law Fluid Flow over Spheroidal Particles, *Ind. Eng. Chem. Res.*, V.33, pp. 403- 410, 1994.
27. A.K. Jaiswal, T.Sundararajan and R.P.Chhabra, Pressure Drop for the Slow Flow of Dilatant Fluids Through a Fixed Bed of Particles, *Can.J.Chem.Engg.*, V.72, pp. 352-353, April 1994.
28. A.Tripathi, T.Sundararajan and R.P. Chhabra, Predictions of Drag and Shape of a Fluid Particle by Upper Bound Approach, *Int. J. Eng. Sci.*, V.33, No.1, pp. 13-25, 1995.
29. V.C.V.Rao, T.Sundararajan and P.C. Das, A Comparative Finite Element Study of h, hp and Moving Grid Adaptive Strategies applied to One- dimensional Flame Propagation, *Int. J. for Engineering Analysis and Design*, In press, 1995.
30. K.Sumathy, A.Venkatesh and V.Sriramulu, 'Analysis of a Solar Water Pump', World Renewable Energy Congress- III, Reading U.K. 11-16, September, 1994.
31. A.R.Srikrishnan, J.Kurian and V.Sriramulu, 'Studies on Stagnation Pressure Loss Associated with Enhanced Mixing of Supersonic Flow', National Conference on Air-Breathing Engines, Trivandrum, India, December 1994.
32. B.V.N.Satish Kumar, P.Charyulu, P.Venugopalan, V.Sriramulu and C.M.Varaprasad, 'Effects of Feed System and Injectors on Hydrogen Burner Performance', 22nd National Conference on Fluid Mechanics and Fluid Power, Osmania University, Hyderabad, India, December, 1994. p73
33. A.Venkatesh, 'Solar Energy - Fundamentals & Applications', Workshop on Non-conventional Energy Sources, Organised by Ministry of Non-Conventional Energy Sources, Government of India, Regional Office Madras and Lakshdweep Electricity Department, at Kavaratti, Lakshdweep, Union Territory of India, January 1994.
34. G.Ramachandran and U.S.P.Shet.: Turbulent Flame Propagation Model and Correlation of Turbulent Burning Velocity Data: A Critical Appraisal. 2nd NCABE -m94, December 15-17,1994,VSSC, Trivandrum, Proc. of the Second national Conference on Air- Breathing Engines and Aero-Space Propulsion, pp 511-517.
35. G.Ramachandran and U.S.P.Shet.:Temperature Dependence of Laminar Burning Velocity of LPG-Air Mixtures, To appear in the *Journal of Material Science and Technology*, New Delhi.
36. M.Ram Gopal & S. Srinivasa Murthy Prediction of metal hydride refrigerator performance based on reactor heat and mass transfer. *Hydrogen Energy*, Vol.18, 1994.
37. A.Mani & S. Srinivasa Murthy Analysis of an open flat plate collector for effluent treatment, *Energy Conversion and Management*, Vol.35, No.12,1994, pp 1061-1071.
38. G.Karthikeyan, A.Mani and S.S.Murthy, 'Analysis of Absorption Refrigeration System with Transfer Tank', *Renewable Energy*, vol.4, pp. 129, 1994.
39. K.Sivanandan and A.Mani, 'Estimation of Viscosity and Thermal Conductivity of R142b and R152a', *International Journal of Energy Research*, Vol.18, 1994.
40. S.Srinivasa Murthy Heat Pumps and Heat Transformers *Chemical Industry Digest*, Oct.1994, pp. 78 - 87
41. S. Srinivasa Murthy Characteristics of Environmentally Friendly Working Fluids for Refrigeration Applications *Chemical Industry Digest*, Dec.1994, pp 89 - 105

42. M.Ram Gopal & S. Srinivasa Murthy Dependence of metal hydride refrigerator performance on reactor heat and mass transfer, Int.Inst. of Ref., Commission B2, Hannover, Germany, 10-13 May 1994.
43. Mani Kumari, A.Mani and V.M.K.Sastri, 'Flow and Heat Transfer in the Annulus of a Pipe Rotating About Parallel Axis in a Superconducting Generator', First ISHMT - ASME Heat and Mass Transfer Conference, BARC, Bombay, Jan.1994.
44. M.Fatouh & S.Srinivasa Murthy Performance of heat and mass exchangers in a R22 - DMETEG vapour absorption refrigeration system, Proc.Twelfth National Heat and Mass Transfer Conference (ISHMT - ASME), Bombay, 5-7 January, 1994, Tata McGraw Hill, pp 1033-1038. u73
45. M.Ram Gopal & S.srinivasa Murthy Analysis of heat and mass transfer in rectangular metal hydride beds Proc.Twelfth National Heat and Mass Transfer Conference (ISHMT - ASME), Bombay, 5-7 January, 1994, Tata McGraw Hill, pp 709-714.
46. G.Karthikeyan, A.mani & S.Srinivasa Murthy Influence of Heat Exchanger Effectiveness on Exergetic Efficiency of a Transfer Tank Operated Solar Refrigerator, Solar Energy Conference, pp ST7.1, Energy conservation Society, Trivandrum, 1994.
47. G. Karthikeyan, A.Mani & S.Srinivasa Murthy Performance of Different Working Fluids in Transfer Tank Operated Solar Refrigerator', National Solar Energy Convention 94 Trivandrum, pp 157, 1994.
48. R.Saravanan, M.P.maiya & S.Srinivasa Murthy Theoretical studies on bubble Pump for H2O - LiBr Vapour Absorption Refrigerator', Conference on Thermal System, January 28-30, BHU (1995).
49. N. Sitaram and R. Hari Babu, "Effect of Incidence Angle on the Boundary Layer Development of an Axial Turbine Rotor Cascade", Proceedings of the National Conference on Fluid Machinery, PP. C1-1 to C1-6, K.J. Somaiya College of Engineering, March 11-13, 1994, Bombay.
50. Govardhan, M., and Vasanthakumar, P., "Turbulence Measurements at the Exit of an Axial Flow Fan Subjected to Radial Distortion", Proc. of 2nd International Conference on Fluid Dynamic Measurements and its Applications, October 19-22, 1994, Beijing, China.
51. Govardhan, M., and S.S.S.R.K. Sastri, "Analysis of Flow Within the Clearance of a High Deflection Turbine Rotor Cascade", Proc. of 2nd International Conference on Fluid Dynamic Measurements and its Applications, October 19 - 22, 1994, Beijing, China.
52. Vasanthakumar, P., and Govardhan, M., "Turbulence Measurements in the Flow Field of an Axial Flow Fan Stage Subjected to Radial Distortion", Proc. of International Symposium on Turbulence Heat and Mass Transfer (ICHMT), Aug. 9-12, 1994, Lisbon, Portugal.
53. Vasanthakumar, P., and Govardhan, M., "Effect of Radial Distortion on an Axial Flow Fan Rotor", Proc. of Second International Conference on Experimental Fluid Mechanics, July 4- 8, 1994, Torino, Italy
54. Sastri, S.S.S.R.K.,and Govardhan, M., "The Measurement of Tip Clearance Flow Within the Tip Gap of an Axial Turbine Cascade", Proc. of 12th U.S. National Congress of Applied Mechanics, June 26 - July 1, 1994, Seattle, WA, USA.
55. Vasanthakumar, P., and Govardhan, M., "Inlet Flow Distortion in an Axial Flow Fan Stage", Proc. of Fourth Triennial International Symposium on Fluid Control and Visualisation (FLUCOME 94), Aug.29 - Sept. 2, 1994, Toulouse Cedex, France.

56. Govardhan, M., Venkatrayulu, N., and Vishnubhotla, V.S., "Influence of Tip Clearance on the Inter Blade and Exit Flow Field of a Turbine Rotor Cascade", Proc.of 39th ASME - International Gas Turbine and Aeroengine Congress, June 13 - 16, 1994, Hague, The Netherlands.
57. Nayak, A.K., Venkatrayulu, N., and Prithvi Raj, D., "Two dimensional Viscous Flow Analysis through 90 and 180 Bend Channels by Adaptive Finite Element Method", National Conference on Fluid Machinery, pp. D1-1 to D1-6, K.J. Somaiya College of Engineering, Bombay, March 11-13, 1994.
58. Nayak, A.K., Venkatrayulu, N., and Prithvi raj, D., "Pre - and - Post Processing in CFD", National Conference on Fluid Machinery, pp. F1-1 to F1-5, K.J. Somaiya College of Engineering, Bombay, March 11-13, 1994.
59. Ramana Murthy, G.V., and Venkatrayulu, N., "Development and Growth of Secondary Flows in a Linear Turbine Cascade", National Conference on Fluid Machinery, pp. C3-1 to C3-6, K.J. Somaiya College of Engineering, Bombay, March 11-13, 1994.
60. Vijaya Vithal Bongale, Prithvi Raj, D., and Venkatrayulu, N., "Some Experimental Investigations in a Vaneless Diffuser of a Centrifugal Compressor", National Conference on Fluid Machinery, pp. B2-1 to B2-6, K.J. Somaiya College of Engineering, Bombay, March 11-13, 1994.
61. Siva Prasad N, Srihari B, and Suryaprakash Ganti, - An adaptive mesh generation scheme for finite element analysis. Computer and structures vol.50 No.1 pp 1-9,
62. Siva Prasad N, Sashikanth P, Ramamurthy V, - Finite Element Analysis of Interference joints - Computer and Structures Vol.51 No.5 pp 536-540 (1994)
63. B. Subba Rao, M.S. Shunmugam, and V. Jayaprakash -Mathematical Model for Generation of Spiral Bevel Gears Journal of Materials Processing Technology, pp 405-412. Aug. 1994
64. K.S. Tripathi, and K. Lakshminarayana - Optimal Design of Cam type indexing mechanisms. IFFToM '94, IISc,Bangalore, Jan.1995.
65. B. Subba Rao, M.S. Shunmugam and V. Jayaprakash - Mathematical Model for Generation of Spiral Bevel Gears Int. Conf. on Advanced Manufacturing Technology, Johar Bahru, Malaysia, pp 405-412, Aug. 1994.
66. S.V.R. Surya Narayana, V. Jayaprakash and M.S. Shunmugam, - Generation of Crowned Spur and Helical Gears, 16th AIMTDR Conf., Bangalore, Dec. 8-10 1994, pp 598-603.
67. B. Subba Rao, M.S. Shunmugam and V. Jayaprakash - Surface Geometry of Spiral Bevel Gears Based on Gleason System, 16th AIMTDR Conf. Bangalore, Dec. 8-10, 1994. pp 263-268. Prakash Kamath & Gopinath K, Design of RCF test rig; National seminar on Industrial Problems in Design Engineering June 25, 1994 Madras
68. Rahul Bhalgat & Gopinath K - Design and Development of an approaches to test ball screws, ibid
69. Vijaya Kumar R, Gopinath K., Bhat K.N. and Rao P R S - Design and Development of High Pressure Oxidation System for semicon ductors in Electronic field, ibid
70. Balasundara Raju I, and Siva Prasad N,- Influence of sequence of Welding on the residual stresses, National Seminar on Industrial Problems in Design Engineering, June 25, 1994, Madras

71. Mohan Krishna, D., Rajagopal, K., Srinivasa Rao, P. and Ganesan, V., Three Dimensional Modeling of Fluid Flow in a Four- Stroke Compression Ignition Engine, Indian Journal of Technology, Vol.1, pp.135-148, June 1994.
72. Ram Reddy, P., Mohan Krishna, D., Govinda Mallan, K.R. and Ganesan, V., Simulation of Exhaust and Intake Processes in a Four-stroke Direct-Injection Diesel Engine by Control Volume Approach, Indian Journal of Technology, India, Vol.1, pp.189-194, August 1994.
73. Pandey, P.K., Mahalakshmi, N.V., Shet, U.S.P., Ganesan, V., and Syed Aga Jan Numerical Modelling of Turbulent Flow through Annular Diffusers, Journal of Institution of Engineers, India, Vol.75, pp.41-48, August 1994.
74. Nedunchezian, N., Balagurunathan, K., Srinivasa Rao, P., and Ganesan, V., Shrouded Inlet Valves for Trade off between Power and Emissions, Indian Journal of Engineering and Materials Sciences, Vol.1, pp.241-245, October 1994.
75. Ravichandran, M. and Ganesan, V., Mean Flow Fields in a Confined Isothermal Flow Downstream of an Afterburner Flame Stabilizer, Indian Journal of Engineering & Materials Sciences, Vol.1, pp.309-319, December, 1994.
76. Ravichandran, M. and Ganesan, V., Aerodynamic Flow Investigations in an Isothermal Model of an Afterburner International Journal of Experiments in Fluids, Vo..17, pp.59-67, 1994.
77. Ram Reddy, P., Mohan Krishna, D., Govinda Mallan, K.R. and Ganesan, V., A Two-Zone Combustion Model allowing for Fuel-air mixing in a Direct-Injection Diesel Engine, Journal of Energy, Heat and Mass Transfer, Vol.16, pp.263-272, 1994.
78. Ravichandran, M. and Ganesan, V., Numerical Analysis of Two- ring Flame Stabilizer Flows in Aircraft Afterburners Paper accepted for publications in the International Journal of Numerical Heat Transfer, Part A: Applications, U.S.A.
79. Ravichandran, M. and Ganesan, V., Isothermal Flow Modelling of Gas Turbine Afterburners Paper communicated to the International Journal of Computational Fluid Dynamics, Canada, 1994. p73
80. Ravichandran, M. and Ganesan, V., Computation of Isothermal and Reacting Flows in Turbojet Afterburners Paper communicated to the International Journal of Numerical Methods for Heat and Fluid Flow, U.K.1994.
81. Balagurunathan, K., Sunkanna, M., Ganesan, V. and Srinivasa Rao, P., Experimental Investigation on the Trapping Performance of the Ceramic Filter for Controlling Diesel Particulate Emissions Journal of Traffic and Transportation, Vol.1, No.pp..5-13, January 1995.
82. Joseph George and Ganesan, V., Numerical Solution of 3D Incompressible Flows using Body Fitted Coordinate System, Indian Journal of Engineering & Materials Sciences, Vol.2, pp.1-7, February 1995.
83. P S Mehta, S K Singal and B P Pundir, A Comprehensive Simulation Model for Mixing and Combustion Characteristics of Small Direct Injection Diesel Engines I Mech E, U.K. 1994.
84. Ramesh Babu, P., Nagalingam, B. and Gopalakrishnan, K.V., "Performance of thin Ceramic coated combustion chamber with gasoline and methanol as fuels in the two stroke SI engine" SAE Paper 941911, U.S.A.
85. Dhinagar, J., Nagalingam, B. and Gopalakrishnan, K.V., "Spark assisted alcohol operation in a low heat rejection engine," SAE Paper 941412, U.S.A.

86. Ramesh Babu, P., Nagalingam, B. and Gopalakrishnan, K.V., "Performance studies with Bio-mass derived high octane fuel additives in Journal of Bio-mass and Bio-energy , Vol.6, No.5, pp.369-379, 1994, Great Britain.
87. Gopinath, R. and Ganesan, V., Numerical Investigation of the Combined Effect of Swirler and Primary Jets on the Recirculation Zones of a Can-Type Combustor by means of orthogonal Array Technique International Journal of Numerical Methods for Heat and Fluid Flow, UK, Vol.4, No.3, pp.207-227, June 1994.
88. Balasubramanian, V., Sridhara, K. and Ganesan, V., Experimental Investigation on the Combustion of Natural Gas in Dual Fuel (Diesel + Natural Gas) Diesel Engines, Communicated to the Third Asian Pacific International Symposium on Combustion and Energy, Hong Kong Polytechnic, Hong Kong, December 11-15, 1995.
89. P S Mehta, P P R Kumar, A K Kolar and K Krishnaiah, Combustion Modeling of Circulating Fluidized Bed, XIII International Conference on Fluidized Bed Combustion, Florida, USA, May 7-10 1995.
90. B Ghobadian, M Bhattacharya and P S Mehta, The Parametric Dependence of Diesel Engine Noise, Third International Congress on Air and Structure - Borne Sound and Vibration Montreal, Canada, June 13-15 1994.
91. Kumar, A., Govinda Mallan, K.R. and Ganesan, V., Computer Design of Cylinder Liner for Reciprocating IC Engines, Proceedings of the National Conference on Industrial Problems in Design Engineering, IIT, Madras, June 25, 1994.
92. Balagurunathan, K., Srinivasa Rao, P., and Ganesan, V., Control of NOX by the Combination of IEGR and Injection Timing Retard, Proceedings of the 9th ISME Conference '94, University of Roorkee, Roorkee, India, November 10-11, 1994.
93. Lakshminarasimhan, V., Nair, K.P. and Ganesan, V., Computer Simulation of Four-Stroke SI Engine Performance Proceedings of the Symposium on Indian Automotive Technology, India, pp.261-171, 1 994.
94. Ravichandran, M., Thangavelu, C. and Ganesan, V., Numerical Study of Inlet Swirl Effects on Isothermal Flow Fields of an Afterburner Proceedings of the National Conference on Air Breathing Engines and Aerospace Propulsion, NCABE, Bangalore, India, pp.40-50, 1994.
95. Baby Chacko, Ganesan, V. and Natarajan, R., Numerical Analysis of Turbulent Flow in a Two-Dimensional 180-Degree Turn around Duct Proceedings of the National Conference on Air Breathing Engines and Aerospace Propulsion, NCABE, Bangalore, India, pp.135-143, 1994.
96. Baby Chacko, Ganesan, V. and Natarajan, R., Numerical Prediction of Mixing Phenomena of Two inclined Jets in a Confined Space First Asian Computational Fluid Dynamics Conference, Bangalore, India, 1994.
97. B Ghobadian, M Bhattacharya, S C Jain and P S Mehta, Effect of Alcohol as Supplementary Fuel on Ignition Delay in a Dual-Fuel Engine, Proc. 9th ISME Conference on Mechanical Engineering University of Roorkee, Nov 1994, pp.623-627.
98. A K Jain, B P Pundir, D Kumar and P S Mehta, Dependence of Engine Noise on Cylinder Pressure and its Derivatives: An Experimental Study, Fourth Symposium on Indian Automotive Technology, (SIAT- 94), The Automotive Research Association of India, Pune, Dec.1994.
99. V.Raghuram, Y.G.Srinivasa & K.Narayanasamy "Effect of the Circuit Parameters on the Electrolytes in Electrochemical Discharge Phenomenon", JI. of Materials Processing Technology, 1345(1994)

100. S.Gowri, K.Narayanasamy & R.Krishnamurthy, "Role of Diamond in Precision Machining of Plasma Sprayed Fine Ceramics", in *Materials Processing and Design I*, published by The American Ceramic Society, Ohio, U.S., (1994) pp.343-353.
101. A.M.Junaid Basha, K.Narayanasamy & M.Singaperumai, "Theoretical Analysis of Hydrostatic Steering Power Requirement in Tracked Vehicles", Communicated for publication in *Intl. JI. of Vehicle Design*, London.
102. V.Raghuram, Y.G.Srinivasa & K.Narayanasamy "Identification of Source Elements of the Spectral times in Electrochemical Discharge (ECD) through high Resolution Emission Spectroscopy, Communicated for publication in *Jl. of Materials Processing Technology*, U.K.
103. S.Gowri, K.Narayanasamy & R.Krishnamurthy, "Role of Diamond in Precision Machining of Plasma Sprayed Fine Ceramics", *Proc. JFCC International Workshop on Fine Ceramics '94*, AICHI, Japan, March 1994.
104. S.Gowri, K.Narayanasamy & R.Krishnamurthy, "Acoustic Emission in Grinding of Plasma Sprayed Ceramic Coatings", *Proc. Intl. Conf. and Exhibition on Powder Metallurgy and Particulate Materials*, Toronto, Canada, May 1994.
105. S.Gowri, K.Narayanasamy & R.Krishnamurthy, "Study on Honing of Plasma Sprayed Ceramic Coatings", *Proc. ASME Sponsored European Conf. on Engineering Systems Design & Analysis (ESDA'94)*, London, July 1994.
106. S.Krishnamurthy & K.Narayanasamy, "Precision Machining of Spacecraft Control Components", *Proc. XVI AIMTDR Conf. CMTI*, Bangalore, Dec. 1994.
107. S.Gowri, K.Narayanasamy & R.Krishnamurthy, "Mathematical Modelling of Tribological Characteristics of Plasma Sprayed Fine Ceramics", *Proc. XI National Conf. on Industrial Tribology*, Indian oil Corporation, New Delhi, Jan. 1995
108. K.Sadashivappa, T.Elanchezhiyan, M.Singaperumal & K.Narayanasamy, "Investigations on an Axial Piston Motor having Pistons with Form Error", *Proc. in IPROMM-94*, Bangalore, Feb. 1995.
109. N.Shashishekhar and Y.G.Srinivasa, A Fuzzy Logic Approach to deadbeat Control, *Proc. IMechE Part I, J. Sys. & Cont. Engg. Vol.208*, pp.189-196, 1994.
110. H.V.Ravindra, M.Ragunandan, Y.G.Srinivasa and R.Krishnamurthy, Tool wear estimation by group method of data handling in turning, *Int. J.Prod. Res.*, Vol.32, No.6, pp.1295-1312, 1994.
111. S.Purushothaman and Y.G.Srinivasa, A Back-propagation algorithm applied to tool wear monitoring, *Int. J. Mach. Tools Manufact.*, Vol.34, No.5, pp.625-631, 1994.
112. V.Raghuram, Y.G.Srinivasa and K.Narayanasamy, Effect of Circuit Parameters on the Electolytes in Electrochemical Discharge Phenomenon, *J.Materials processing*, Vol.34, No.5, 1994.
113. H.V.Ravindra, S.Ashok Kumar and Y.G.Srinivasa, Investigation on in-process tool wear monitoring through time series modelling and pattern recognition, *International Journal of Production Research*, 1995.
114. H.V.Ravindra, Y.G.Srinivasa and R.Krishnamurthy, Acoustical Emission for tool condition monitoring in metal cutting,
115. S.Purushothaman and Y.G.Srinivasa, Optimal Discriminant Plane Applied To Tool Wear Monitoring, *Trans. ASME- J. of Engg. for Industry*.

116. V.Raghuram, Y.G.Srinivasa and K.Narayanasamy, Identification of Source Elements of the Spectral lines in Electrochemical Discharge (ECD) through high Resolution Emission Spectroscopy, *Jl. of Materials Processing Technology*, U.K.
117. S.Ravi Teja and Y.G.Srinivasa, Investigations on the Stochastically Optimized PID Controller for a Linear Quarter-car Road Vehicle Model, *Vehicle System Dynamics Journal*, Netherlands.
118. H.V.Ravindra, Y.G.Srinivasa and R.Krishnamurthy, Comparative study of modelling for tool wear estimation in turning, *Second Asia Pacific Conference on Material Processing*, NSU, Singapore, 16-19 Nov. 1994.
119. S.R.Teja and Y.G.Srinivasa, PID structured stochastic output feedback control of an active suspension for 2-DOF vehicle model, *2nd IEEE Mediterranean Symposium on New Directions in Control and Automation*, Chania Crete, 19-22 June 1994.
120. Y.G.Srinivasa, V.Raghuram and K.Narayanasamy, Electrochemical discharge machining of quartz glass enhancement of machining efficiency, *UME 3 International Conference on Ultraprecision in Manufacturing Engineering*, Aachen Germany, 2-6 May 1994.
121. Y.G.Srinivasa, V.Raghuram and K.Narayanasamy, Emission spectroscopy measurements for estimation of temperature in electrochemical discharge process, *UME 3 International Conference on Ultraprecision in Manufacturing Engineering*, Aachen Germany, 2-6 May 1994.
122. S.Purushothaman and Y.G.Srinivasa, An Adaptive Algorithm For Weight Update In Backpropagation and Its Application To Pattern Recognition In Turning, *International Conference On Advanced Manufacturing Technology*, Johor Bahru, Malaysia, August 29-30, 1994.
123. H.V.Ravindra, Y.G.Srinivasa and R.Krishnamurthy, Comparative Study in tool wear estimation in turning, *IX ISME Conference*, University of Roorkee, Roorkee, 10-11, Nov. 1994.
124. H.V.Ravindra and Y.G.Srinivasa, Tool wear estimation using group method of data handling in turning, *16th AIMTDR Conference*, CMTI, Bangalore, 8-10 Dec. 1994, pp.512-521.
125. H.V.Ravindra, Y.G.Srinivasa and R.Krishnamurthy, Pattern Recognition analysis for tool status monitoring using acoustic emission in turning', *16th AIMTDR Conference*, 8-10 Dec. 1994, pp.522-527.
126. H.V.Ravindra, Y.G.Srinivasa and R.Krishnamurthy, Pattern Recognition Analysis of Acoustic Emission Signals For Cutting Tool Monitoring in Turning, *Proceedings of the 16th All India Manufacturing Technology Design & Research Conference*, pp.522- 528, CMTI Bangalore, Dec. 8-10, 1994.
127. The Effect of Geometric Irregularities of Journals on the Performance of Porous Bearings, T.S.Chennabasavan and R.Raman *Journal of Engineering Tribology*, Institutions of Mechanical Engineers (London), 1994, pp.141-145.
128. Experimental Study of Friction in Hydraulic Actuators with Sealless Pistons, N.Meikandan, Raman, and M.Singaperumal, *Wear* 176 (1994), pp.131-135.
129. Effect of Variable Permeability and Radial Clearance on the Performance of Finite Porous Journal Bearings, T.S.Chennabasavan, and R.Raman, *Institution of Engineers (India) Vol. 75*, August 1994, pp.75-81.
130. Asokan T. & M.Singaperumal, "Control of Interaction Impedance using Electrohydraulic Servosystem - an application to Robotic Deburring", *Int. Conf. on Advanced Manfg. Tech.*, Malaysia, Aug. 1994.

131. Asokan T. & M.Singaperumal, " Bond Graph Modelling of a Bridge Circuit for Electrohydraulic Impedance Control System for Robotic Interaction Control", in *Proc. 1994 Conf. of Int. Simuln. Soc.*, Switzerland 1994.
132. M. Singaperumal, Microsensors & Microactuators, Invited paper for *IPRoMM workshop on Micromechatronic Systems*, Bangalore Feb 1995, pp 3.1 - 3.9
133. Ganesha Udupa, K.Thirumalaivelu, R. S. Sirohi, M. P. Kothiyal, M. Singaperumal, Precise form and surface error measurements of engineering and optical parts by Confocal Scanning Optical Microscope, *Proc. of National Laser Symp. IRDE, Dehradun, 1995*, pp 108-109.
134. Ganesha Udupa, K.Thirumalaivelu, R.S. Sirohi M.P. Kothiyal, M.Singaperumal. Form error characterisation by an optical method, *Proc. IPRoMM, Bangalore, 1995*, pp 75-84.
135. M.A.Chepe and P.K.Philip, "Cutting fluid injection at tool- chip interface to improve machining performance", *J. of Instn. of Engineers, India, Vol.75, Nov.1994*, pp.25-30.
136. S.Gowri, K.Narayanasamy and R.Krishnamurthy, Mathematical modelling of Tribological characteristics of plasma sprayed fine ceramics, *Proc.XI National Conf.on Industrial Tribology Indian Oil Corporation, New Delhi, Jan. 1995*.
137. H.V.Ravindra, Y.G.Srinivasa and R.Krishnamurthy, Pattern recognition analysis for tool status monitoring using acoustic emission in turning, *16th AIMTDR Conf. 8-10 Dec.1994*, pp 522- 527.
138. H.V.Ravindra, Y.G.Srinivasa and R.Krishnamurthy, Comparative study of tool wear estimation in turning, *IX ISME conference University of Roorkee, Roorkee 10-11, Nov. 1994*
139. S.B.Senthilkumar, R.Krishnamurthy and C.V.Gokularathnam, Metallurgy of Ceramic cutting tools, *Int.Conf.on Advances in physical Metallurgy, ICPM 94, Baha Atomic Research Centre 9-11, March 1994*.
140. M.Pugazhendi, R.Krishnamurthy, Condition Monitoring and control strategy for deep-hole drilling, *7th International conference on COMADEM - Technology Update, September 26-29, 1994, New Delhi*.
141. M.Pugazhendi, R.Krishnamurthy, "Telemetry as an intelligent sensor for deep hole drilling, *Proc. 16th AIMTDR conference December 8-10, 1994, Bangalore, pp 509-515*.
142. M.Pugazhendi, R.Krishnamurthy, Acoustic Emission in Condition Monitoring of deep-hole drilling, *XI National Conference on Industrial Tribology, New Delhi, Jan.22- 25,1995*
143. Sunilkumar N.Kakade, L.Vijayaraghavan and R.Krishnamurthy Tool condition monitoring in face milling, *AIMTDR, 8-10 December 1994, Bangalore, pp 503-508*.
144. Sunilkumar N.Kakade, L.Vijayaraghavan and R.Krishnamurthy Monitoring of Tool status using intelligent acoustic Emission sensor and Decision based Neural networks, *Int.Conference on Industrial Automation and Control organised by IEE, 5-7 Jan.1995, Hyderabad. pp 25-29*.
145. S.V.Nanda, M.S.Shunmugam, Automation of design and drafting of stamping dies for pole-laminations, *16th AIMTDR, CMTI, Bangalore 1994, pp 322-326*.
146. S.V.R.Surya Narayana, V.Jayaprakash, M.S.Shunmugam, Generation of crowned spur and helical gears, *16th AIMTDR, CMTI Bangalore, 1994, pp 198-203*.
147. S.S.Patil, T.Vijayakumar, M.S.Shunmugam, Performance Improvement in CNC machine tools by error compensation, *2nd Nat. Conf. on CAD/CAM, PSG Tech. Coimbatore, 1994, B3.1-B3.7*

148. Ramamoorthy, B. Radhakrishnan, V. A study of the surface deformation in press and shrink fitted assemblies, *Wear*, V.173, (1994), p.75-83.
149. Rajmohan, B. Radhakrishnan, V. On the possibility of process monitoring in grinding by spark intensity measurements, *Trans ASME, J. Engg. for Industry*, V.116, (1994), p.124-129.
150. Saji Varghese, Radhakrishnan, V. A multisensor approaches to in-process monitor of surface roughness, *J.Mater Process Tech.* V.44, (1994), p.353-362.
151. Y.B.Shenoy and R.Krishna Kumar, Dynamic Crack Growth in a Power Hardening Viscoplastic Material, *Trans ASME Ji. Engg. Materials and Technology*, Vol.116, No.4, pp.465-470, 1994.
152. R.Krishna Kumar, J.N.Reddy, Stress distributions during fibre pull out, accepted for publication, *Trans ASME, Ji. App. Mech.*, 1994.
153. G.Ravichandran, V.P.Ragupathy, N.Ganesan and R.Krishna Kumar, Prediction of temperature distribution during circumferential welding of thin pipes using f.e.m., *Intl. Ji. for Joining of Materials*, 1994.
154. S.Kakade, L.Vijayaraghavan and R.Krishnamurthy, 'In process tool wear and chip form monitoring in face milling operation using acoustic emission', the special issue of the *Journal of Material Processing Technology*, Elsevier Sciene publica- tions, Aug.1994.
155. M.S.Shunmugam, P.K.Philip and A.Gangadhar, "Improvement of wear resistance by EDM with tungsten carbide in P/M electrode", *Int. J. Wear*, UK, Vol.171, 1994, pp.1-5.
156. V.E.Annamalai, T.Sornakumar, C.V.Gokularathnam and R.Krishnamurthy, 'Grinding of transformation toughening yttria stabilised tetragonal zirconia polycrystals, *J.Mater.Proc.Tech.*Vol.40 1994, pp 87-98
157. V.E.Annamalai, T.Sornakumar, R.Krishnamurthy and C.V.Gokula- rathnam, Lapping of ;composite of alumina and partially stabilised zirconia, *Int. J.Refractory Metals and Hard materials*, 1994, pp 207-210.
158. V.E.Annamalai, T.Sornakumar, R.Krishnamurthy and C.V.Gokula- rathnam, Lapping of composite of Y-TZP and Ce TZP, *J.Mater. Sci. Lett.* vol.13, 1994,pp4187-189.
159. S.Gowri, K.Narayanasami and R.Krishnamurthy, Role of Diamond in Precision Machining of Plasma sprayed fine ceramics, *Proc. JFCC International Workshop on Fine Ceramics 94*, AICHI, Japan, March 1994.
160. S.Gowri, K.Narayanaswamy and R.Krishnamurthy, 'Acoustic Emission in Grinding of plasma sprayed ceramic coatings'*Proc.Intl.Conf. and Exhibition on Powder Metallurgy and Particulate Materials*, Toronto, Canada, May 1994
161. S.Gowri, K.Narayanasamy and R.Krishnamurthy, Study on Honing of plasma sprayed ceramic coatings, *Proc. ASME sponsored European Conf. on Engineering Systems Design and Analysis (ESDA 94*, London, July 1994
162. Hegde, V.Jayaprakash, M.S.Shunmugam, Surface Geometry of Octoid Straight Bevel Gear, *Int.Gearing Conf. New Castle Upon Tyne*, UK, Sep. 1994, pp 353-358.
163. B.Subba Rao, M.S.Shunmugam, V.Jayaprakash, Mathematical model for Generation of Spiral Bevel Gears, *Int.Conf.on Adv. Manufacturing Tech. Johar Bahru* , Malaysia, Aug.1994 pp 405-412.

164. V.Rajeswari, V.Jayaprakash and M.S.Shunmugam, Career choice by analytic hierarchy process, J. of Higher Education, Vol.18, No.1, 1995, p.83-103.
165. VankataRamana, K. Ramamoorthy, B. Radhakrishnan, V. Identification of texture features in machined surfaces, Proc.Int. ASME Conf. Information Processing, (1994), p.69-80.
166. D. Subhaskar and S.Srinivasamurthy, Saturated Solar Ponds, Experimental Verification Solar Energy.
167. Saji Varghese, Achuthan, N. Radhakrishnan, V. In-process monitoring of surface roughness using non-contact inductive sensor, Proc. of First Magneto Electronics Int. Symp. (1994) Nagano, Japan, p.199-202.
168. Boopathy, S. Radhakrishnan, V. An approach to robot off-line programming and simulation, Proc. of IEEE/IAS Int. Conf on Industrial Automation and Control, (1995), p.461-466.
169. B.Anil, Ch.Pavana Chand and R.Krishna Kumar, Analysis of metal forming processes - Development of a finite element framework, Int. Conf. on Advanced Manufacturing Technology, ICAMT 94, Aug.29-30, 1994, Malaysia, pp.281-290.
170. V.Phanindranath and N.Ramesh Babu, A numerical approach for estimating the parameters in dressing grinding wheels with a pulsed laser, Proc. Int. Conf. on Advanced Mfg. Technology, Aug.29-30, 1994, Malaysia, pp.191-202.
171. K.I.Ramachandran, L.Vijayaraghavan and R.Krishnamurthy Thermal stress induced wear of grinding wheels, Proc. of the Int.Conf.on Advanced manufacturing Technology, 29-30 Aug.1994, Johor, Malaysia, pp 53-60
172. S.Kakade, L.Vijayaraghavan and R.Krishnamurthy, 'In process tool wear and chip form monitoring in face milling', Proc.of the Int.Conf.on Advanced manufacturing Technology, 29-30, Aug.1994, Johor, Malaysia, pp 527-534.
173. V.Phanindranath and N.Ramesh Babu, A numerical approach for estimating the parameters in dressing grinding wheels with a pulsed laser, Proc. Int. Conf. on Adv. Mfg.Tech., Aug. 29- 30, 1994, Malaysia, pp.191-202.
174. D.K.Sharma, P.K.Philip and B.Veerabhadra Rao, "Performance of classifier for identification of machining processes using statistical texture parameters", Proc. AMSE Conf. on Information Processing, New Orleans, USA, Nov.1994, pp.59- 68.
175. Boopathy, S. Ramesh Babu, N. Radhakrishnan, V. A space representation approach for manipulator workcell design, Proc.of 16th AIMTDR Conf. (1994) Allied Publishers Ltd, p.371-376.
176. Saji Varghese, Radhakrishnan, V.A new approach to in-process monitoring of surface roughness, Proc.of 16th AIMTDR Conf. (1994), Allied Publishers Ltd, p.417-422.
177. Arun, S. Radhakrishnan, V. Wheel wear monitoring in grinding using vision, Proc. of 16th AIMTDR Conf.(1994), Allied Publishers Ltd, p.485-490.
178. Vankat Raman, K. Ramamoorthy, B. Radhakrishnan, V. Classification of manufactured surfaces based on textural information, Proc. of 16th AIMTDR Conf. (1994), Allied Publishers Ltd, p.429-434.
179. Saji Varghese, Radhakrishnan, V. Multisensor monitoring of surface roughness, 2nd National Conf. on CAD/CAM (1994) PSG College of Technology, Coimbatore, p.K1-1 - K1-5.

180. Ch Pavana Chand and R.Krishna Kumar, Modelling of steady state extrusion using flow formulations, 2nd National Conf. on CAD/CAM, PSG College of Technology, Coimbatore, Aug.19-20, 1994, pp.A12-1 to A12-8.
181. B.Anil, Ch Pavana Chand and R.Krishna Kumar, A finite element model for metal forming processes, 2nd National Conf. on CAD/CAM, PSG College of Technology, Coimbatore, Aug.19-20, 1994, pp.A13-1 to A13-13.
182. B.Anil, Ch Pavana Chand and R.Krishna Kumar, Constitutive framework for the analysis of metal forming processes and its implementation, 16th AIMTDR Conf, CMTI Bangalore, Dec.8- 10,1994, pp.716-721.
183. V.Phanindranath and N.Ramesh Babu, Estimation of thermal stresses in the regions affected by laser dressing of grinding wheels - Abstract presented at National Seminar on Industrial Problems in Design Engg., June 25,1994 IIT Madras, pp.40-41.
184. V.Phanindranath and N.Ramesh Babu, Theoretical modelling of laser dressing of grinding wheels, Post paper presented at the National Laser Symp. held at IIT Madras during Feb.17- 19, 1993.
185. V.Phanindranath and N.Ramesh Babu, A model for prediction of laser dressed grinding wheel surface topography, Proc. of 16th AIMTDR Conf., Dec.8-10, 1994, Bangalore, pp.572-577.
186. S.Boopathy, N.Ramesh Babu and V.Radhakrishnan, A space representation approach for manipulator workcell design, Proc. of 16th AIMTDR Conf., Dec.8-10, 1994, Bangalore, pp.371-376.
187. Sunil Kumar Kakade and L.Vijayaraghavan,'A E technique for in- process monitoring of tool status in unattended manufacturing', 9th National convention on Production Engineers organised by the Institution of Engineers (India), Sept. 30th and October 1st, 1994, BHEL, Trichy.
188. Baby Chacko, V.Balabaskaran, E.G.Tulapurkara, H.C.Radha Krishna " Performance Characteristics of S-cambered profiles with cut-off trailing edges ", A.S.M.E. Journal of Fluids Engineering, vol 116,pp 522-527, Sep. 1994.
189. R.S. Madhusudan, P.A. Aswatha Narayana, V. Balabaskaran, E.G. Tulapurkara " Boundary Layer Studies over an S-blade", Fluid Dynamics Research Journal(Japan), pp 241-258, 14(Sep 1994)
190. Kumaraswamy, S., CH.B.N. Murthy, S.K. Bhave and R.K. Kapoor,'Cavitation noise and its analysis in a model hydroturbine',Proc. 2nd Intl. Sym. on Cavitation, Tokyo, Japan, Apr.1994,pp.179 to 184.
191. Muthukumar, P. and S. Kumaraswamy, 'Interaction between impeller geometry and cavitation effects in centrifugal pumps', Proc. 2nd Intl. Sym. on Cavitation, Tokyo, Japan, Apr.1994, pp.433 to 439.
192. Subba Ramiah, S.V. and S. Kumaraswamy, 'Visual studies in the suction side of radial flow pump impeller', Proc. 3rd Asian Sym. on Visualisation, Chiba, Japan, May 1994, Paper D-14, pp.385 to 391.
194. Kumaraswamy, S. and E. Vijaya Babu,'Computer aided selection of pumps', Proc. Natl. Conf. on Fluid machinery (FMCONF94), Bombay, Paper E-3, 1994.
194. T.L. Viswanatha Shastry, V.Balabaskaran, E.G.Tulapurkara "Analysis of Flow over S-Blade Profiles using Integral Method", 21st National Conference of Fluid Mechanics and Fluid Power, Hyderabad, Dec. 27-29, pp FM 3.1-3.6, 1994.

195. Kumaraswamy, S., 'Efficient energy utilization by scientific choice and use of pumps' Proc. Intl. Sem on Technology for a better tomorrow, 9th Indian Engineering Congress, Institution of Engineers(India), Calcutta, Dec.1994, Paper No.1.1.3.
196. Subbaramiah, S.V. and S. Kumaraswamy, 'A design procedure for radial flow pumps combining area ratio method and slip power method' Proc. 21st National Conf. on Fluid Mech & Fluid Power, Hyderabad, Dec. 1994, pp.PB 3.1 to 3.7.
197. Natarajan, R., "Combustion-generated Air Pollution", J. Institution of Engineers (India), 74, 157-161(1994). Awarded The Sir Rajendra Nath Mookerjee Memorial Prize 1993-94.
198. Natarajan, R., "A Survey of Diagnostic Techniques for Measurements in Liquid Sprays", Fuel Science and Technology, 13(2), 39-60 (1994).
199. Natarajan, R., "Some Future Directions for Indian Engineering Education to face the Challenges of the Next Century", The Indian Journal of Technical Education, 18(1), 9-15, January - March, 1995.
200. Natarajan, R., "The Multiple Functions of Engineering Teachers", The Indian Journal of Technical Education, 18(2), 12-16, April- June, 1995.
201. Natarajan, R., "Design of the Organizational Framework for Accreditation of Engineering Institutions", The Int.J.Engg. Education, Tempus Publications, 10(1), 25-35 (1994).
202. Natarajan, R., "The Quality Improvement Programme", Ibid, 36- 40 (1994).
203. Natarajan, R., "Education and Employment of Women in Engineering in India", Ibid, 111-113 (1994).
204. Natarajan, R., K.Ganesh Babu and M.S.Ananth, "The Nature and Scope of the Brain-drain of Engineering Graduates", Ibid, 114- 123 (1994).
205. Natarajan, R., L.S. Chandrakant, K.Seetharama Rao and A. Ramakrishnan, "How Indian Industry perceives Engineering Curricula in relation to Job Requirements", Ibid, 124-126 (1994).
206. Natarajan, R., "Distance education in India: its suitability for programmes in engineering and technology", Industry and Higher Education, 9(2), 115-122 (1995).
207. Natarajan, R., "A Range of Issues and Strategies for enhancing the Effectiveness of Engineering Education in India", VII International Symposium on World Trends in Science and Technology Education", The Netherlands, August 24-31, 1994.
208. Natarajan, R., "The Role of Industrial Training in the Education of an Engineer", IV International Conference on Modern Industrial Training", Xian, China, Oct.16-19, 1994.
209. Natarajan, R., "The Nature and Scope of Institution-Industry Interaction", International Conference on Engineering Education - An Indian Perspective, Visakhapatnam, Nov.21-23, 1994.
210. Natarajan, R., "Organizational Development of Higher Technological Institutions", Invited Lecture, National Programme on Excellence in Higher Technical Education, National Foundation of Indian Engineers, New Delhi, Nov.7-8, 1994.
211. Natarajan, R., "Physical Models for Describing Spray and Droplet Combustion Phenomena", Invited Lecture, Indian Chemical Engineering Congress, IIT, Kharagpur, Dec. 14-17, 1994.

212. Natarajan, R., N.Sriram and K.N.Seetharamu,"Transient Analysis of Interference Effects in Three-Sphere Systems during Forced Convection", Second National Conference on Air-Breathing Engines and Aerospace Propulsion, V.S.S.C., Trivandrum, Dec.15-17, 1994.
213. Natarajan, R., Baby Chackoo and V.Ganesan,"Numerical Analysis of Turbulent Flow in a Two-Dimensional 180-Degree Turn-Around Duct", Ibid.
214. Natarajan, R., T.Michael N.Kumar and V.Ganesan, "Mixing of Confined Gas Jets - A Three-Dimensional Numerical Prediction", Ibid.
215. Natarajan, R.,"Management of Technical Institutions", Invited Lecture, Regional Seminar on "Management of Technical Institutions", BIET, Davangere, Jan.20, 1995.
216. Natarajan, R.,"Management of Technology - with special reference to Management of Energy Technologies", Invited Lecture, Workshop on Technology Management, Bangalore, Jan. 21, 1995.
217. Natarajan, R.,"The Place of Teaching in the Professional Responsibilities of Engineering Faculty Members", National Seminar on "Importance of Pedagogical Training for Technical Teachers", Sardar Patel College of Engineering, Bombay, Jan.25, 1995.
218. Natarajan, R.,"Some Issues in the Management of Technical Education", National Seminar cum Workshop on Management of Technical Education, MACT, Bhopal, Feb. 14-15, 1995.
219. Natarajan, R.,"The Implications of our recent Economic, Educational and S & T Policies for Technical ducation", Invited Lecture, Symposium on "Science and Technology Policy and Economic Reforms", r.P.S.Lokanathan Centenary Celebrations, ISEC, Bangalore, March 5, 1995.
220. Natarajan, R.,"The Multiple Functions of Engineering Teachers", Invited Lecture, Siddaganga Institute of Technology, Tumkur, March 6, 1995.
221. Natarajan, R.,"Accreditation as a means of Quality Improvement in Technical Education", National Seminar on Total Quality Management in Technological Institutions, Anna University, Madras, March 17-18, 1995.
222. Natarajan, R.,"The Role of Institutions in Industry - Institution Interaction", Invited Lecture, Regional Seminar on Policy Issues to promote Industry-Institute Interaction, Anna University, Madras, March 27, 1995.
223. Natarajan, R., D.K.Sharma and S.Stephen,"Design of 150 mm Schlieren System for Flow Visualization Studies", XXII National Symposium on Opto & Opto-Electronic Instrumentation, CSIO, Chandigarh, March 29-31, 1995.
224. Natarajan, R., D.K.Sharma and S.Stephen, "Simulated Droplet Diffusion Flame Studies with the help of Moire Deflectometry" Ibid.

4.11 Metallurgical Engineering Department

4.11.1 Introduction

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

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

4.11.2 Details of Faculty

Name and Qualification	Major area of Specialisation
Professors	
K.Anantha Padmanabhan, Ph.D (Cantab)	Metal forming (rolling, sheet metal, forging), mechanical metallurgy, Superplasticity.
D.R.Gopalakrishna Achar, Ph.D (IIT Madras)	Metal joining, (welding technology) failure analysis, corrosion, industrial metallurgy
K.J.Lakshminarayana Iyer, Ph.D(IITMadars)[Head]	Material science, failure analysis, physical metallurgy.
O.Prabhakar, Ph.D (IIT-Madras)	Non-destructive testing and process modeling.
V.M.Radhakrishnan, Ph.D (IIT-Madras)	Fracture mechanics, high temperature materials, fatigue and creep.
H.Md.Roshan, Ph.D (IIT-Madras)	Metal casting (foundry technology)
S.K.Seshadri, Ph.D (London)	Chemical metallurgy, surface technology utilisation of renewable agricultural resources.
K.Srinivasa Raghavan, Ph.D (Pensilvaniya)	Materials science, physical metallurgy and electron microscopy.
S.Sundaresan, Ph.D (IIT-Madras)	Metal joining, welding metallurgy, mechanical behaviour.
R.Vasudevan, Dr.-Ing (Aachen)	Physical metallurgy, heat treatment, X-ray diffraction and materials Technology.
Associate Professors	
C.V.Gokularathnam, Ph.D (Florida)	Physical metallurgy, X-ray diffraction, advanced ceramics SEM & TEM.
S.D.Pathak, Ph.D. (IIT-Madras)	Materials science and technology, mechanical behaviour, material testing, metal casting
K.Prasad Rao, Ph.D (IIT-Madras)	Metal joining, corrosion
S.Raghavan, Ph.D (IISc)	Physico-chemical aspects of process metallurgy, extractive metallurgy.
S.Ramakrishna Iyer, Ph.D (IIT-Madras)	Furnace technology, extraction metallurgy, hot corrosion.
P.Venugopal, Ph.D (IIT-Madras)	Metal forming, extrusion of metals and metallic powder, metal forming equipment and tool.

Name and Qualification**Major area of Specialisation****Assistant Professors**

P.Kesavan Nair, Ph.D (IIT-Madras)

Physical metallurgy, X-ray diffraction.

Paramanand Singh, Ph.D (IIT-Bombay)

Powder metallurgy, ceramics and composites

K.Swaminathan, Ph.D (IIT-Madras)

Metal forming, materials science

B.Guha, Ph.D (IIT-Madras)

Mechanical testing, metal joining

Lecturers

V.Sampath, Ph.D (IISc)

Materials technology, electroslag refining.

Senior Scientific Officers Gr II

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

Metal forming

S.S.Bhattacharya, Ph.D. (IIT-Madras)

Metal forming

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

Non-destructive testing ceramics

S.Kumaran, M.Sc.(Madras)

Non-ferrous extraction metallurgy, corrosion and chemical metallurgy.

Technical Officer

B.Raghunatha Rao, Ph.D (IIT-Madras)

Heat treatment, failure analysis

4.11.3 Students on Roll (as of Jan '95)

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D	2	-	3	-	7	1	6	-	2	-	20	1	21
M.S.	3	-	1	-	1	-	-	-	-	-	05	-	05
M.Tech	9	3	9	-	-	-	-	-	-	-	18	3	21
B.Tech	31	-	27	2	26	2	26	1	-	-	110	5	115
Total	45	3	40	2	34	3	32	1	2	-	153	9	162

4.11.4 Number of Scholarships/Fellowships holders

Programme	Institute	Others	Total
Ph.D	15	1	16
M.S.	3	-	3
M.Tech	24	-	24
Total	42	1	43

4.11.4 Number of Degrees Awarded

Programme	No. awarded
Ph.D	11
M.S.	3
M.Tech	5
B.Tech	24
Total	43

4.11.5 Instrument/Equipment Designed and developed

1. Arnold Meter for determining the apparent density of both free and non free flowing powders and premixes.
2. Carney Apparatus for determining the apparent density of non-free flowing metal powders.
3. Glove Box to handle the silicon carbide whiskers safely.
4. Solid state chemical Sensor using one end closed magnesia stabilised zirconia tubes for measuring oxygen contents in liquid metals and gases.
5. Solid state chemical sensor using one end closed calcium beta alumina tubes for measuring calcium contents in liquid metals.
6. Design and Development of a new gadget for rapid fatigue testing using high power ultrasonic vibrations.
7. A Glove box to handle the Sic Whiskers safely.

4.11.6 New facilities added and major equipment procured

1. Schimadzu XDD-1 X-ray generator & diffractometer
2. JEOL JSM 5300 Scanning Electron Microscope
3. Low speed Diamond Saw, Model -SBT 650
4. Plasma Welding Machine
5. Synergic Mig welding machine
6. Low Cycle Fatigue machine - Schenck and Instron

4.11.7 Short term courses/Workshops/Seminars/Symposia/Conferences Organised

S.No.	Co-ordinator(s)	Title of Course/Workshop Seminar/Symposia/Conference	Period
1.	Dr.C.V.Gokularathnam	Principles and Applications of Scanning Electron Microscopy	22.10.94
2.	Prof.D.R.G.Achar Dr. B.Guha	Stress Analysis in Weld Design	02.02.95- 04.02.95

4.11.8 Short term Courses/Workshops/Seminars/Symposia/Conferences/ Training attended by the faculty in recognised Academic Institutions

Sl.No.	Name of Faculty	Title	Date	Venue
1.	Dr.S.Sundaresan	National Welding Seminar of Indian Institute of Welding	Nov.24-26 1994	Jamshedpur
2.	Dr.V.Sampath	Workshop on Testing and characterisation of materials arranged by HAL Bangalore	25-28 May 1994	HAL Bangalore
3.	Dr.V.Sampath	Advanced Techniques in industrial and Technical Photography	10-11 June 1994	HAL Bangalore

4.11.9. Invited Lectures delivered by the Faculty In Academic Institutions and Public bodies.

SI.No.	Name of the Faculty	Topic of the Lecture	Date	Delivered at
1.	Dr.S.Sundaresan	Welding process Welding Metallurgy	7 & 8 Nov. 1994	Industrial Quality Concepts, Madras
2.	Dr.S.Sundaresan	Welding of Titanium alloy	Jan 20 1995	HAL Bangalore
3.	Dr.D.R.G.Achar	Welding Technology & Inspection	13th Sept. 1994	Refinery School of Training, MRL Madras.
4.	Dr.D.R.G.Achar	Stress analysis in Weld Design	2-4 Feb 1995	IIM-IIT Madras
5.	Dr.D.R.G.Achar	Fundamentals of Fabrication and Product Technology	21 Feb. 1995	Refresher Course for ASNT Level III Exam. Kalpakkam
6.	Dr.D.R.G.Achar	Non metals and composites	22 Feb. 1995	ISNT Kalpakkam
7.	Dr.D.R.G.Achar	Welding Technology Part II	24 Feb 1995	Refinery Engg. School of Training RESOT, Madras

4.11.10 Distinguished Visitors to the Department (Important dignitaries above the level of Professors)

SI.No.	Name of the Visitor and Occupation	Date of visit	Purpose of visit (Lecture/Discussion)
1.	Dr.K.Murall, Florida State Univ.	28.07.94	Micromechanical Modelling of Superplastic Deformation
2.	Prof.P.Ramakrishnan IIT Bombay	20.10.94	Global scenario of P/M as a new emerging material processing technique.

4.11.11. Sponsored Projects (under progress)

S.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Co-ordinator(s)
1.	Evaluation of Texture profile of aluminium killed EDD steels	3 Years	SAIL Ranchi	6.21	Prof.K.A.Padmanabhan Dr.K.Swaminathan
2.	Computer aided simulation computer aided design & Engineering in welding (CASCADE)	4 Years	DST	14.00	Prof.D.R.G.Achar Dr.B.Guha
3.	Welding of Titanium alloys	5 Years	DST	12.00	Prof.S.Sundaresan
4.	Effect of Fusion zone grain refinement on the weldability of aluminium and titanium alloys	3 years	AR&DB	6.00	Prof.S.Sundaresan
5.	Fundamental studies in Superplasticity and high temperature creep	3 Years	Indo-US	10.34	Prof.K.A.Padmanabhan Dr.S.S. Bhattacharyya

S.No.	Title	Period	Funding Agency	Amount (In Lakhs)	Co-ordinator(s)
6.	Amorphous-Crystalline transition and opto-electronic behaviour of some chalcogenic thin films	3 Years	DST	5.30	Prof.K.S.Raghavan
7.	Some Studies on Low Cycle Fatigue behaviour of AISI Austenitic Stainless Steel	4 Years	DAE	2.86	Prof K.A.Padmanabhan Dr S.S.Bhattacharya
8.	Phenomenology and Rheology of Plastic and Superplastic deformation under different loading conditions for materials forming applications	3 Years	DST	8.97	Prof K.A.Padmanabhan Dr S.S. Bhattacharya

4.11.12 Major Consultancy Assignments

S.No.	Title	Organisation	Amount (In Lakhs)	Co-ordinator
1.	Material characterisation Fracture toughness etc.	TELCO- TISCO	3.00	Dr.S.D.Pathak
2.	Cyclic behaviour of PVC pipe joints	Polytrusion Madras Pvt. Ltd.	0.37	Dr.S.D.Pathak
3.	Fatigue of Fastners	Dev Fasteners Ltd. Madras	0.10	Dr.S.D.Pathak
4.	High Temperature Behaviour of Super Alloys	Karthik Steels Ltd. Madras	0.30	Dr.S.D.Pathak
5.	Fracture Toughness of Titanium welds	TEAM Madras	0.10	Dr.S.D.Pathak
6.	Rivet Holding strength of brake lining samples	Rane Brake Linings Ltd. Madras	0.12	Dr.S.D.Pathak
7.	High Temperature static and short term creep behaviour	Karthik Steels Ltd.Madras	0.45	Dr.S.D.Pathak
8.	Estimation of High temperature linear Co-efficient of expansion of valve seat	Ashok Leyland Ltd.	0.17	Dr.K.Prasad Rao
9.	Residual stress analysis of clutch plates	Rane Brake Linings Ltd.	0.14	Dr.P.Kesavan Nair
10.	Phase Analysis mullite based ceramics	Carborandum Universal Ltd. Madras	10.26	Dr.P.Kesavan Nair
11.	SEM Microstructure analysis	Madras Univ. CLRI, Hydro S&S Industries	0.17	Dr.C.V.Gokularathnam
12.	Characterisation of formability of four different ...	TISCO Jamshedpur	6.00	Dr.K.Swaminathan
13.	Characterisation of the formability of 3 grades.....	Indian Stainless Steel Dev.Assn.	3.00	Prof.K.A.Padmanabhan Dr.K.Swaminathan
14.	Industrial Consultancy	PIPDIC Pondicherry	0.10	Prof.D.R.G.Achar

S.No.	Title	Organisation	Amount (in Lakhs)	Co-ordinator
15.	Failure Analysis	Nagarjuna Fertilizers & Chemicals Ltd. Kakinada	0.20	Prof.K.J.L. Iyer B.Raghunatha Rao R.Murugesan
16.	Failure Analysis of an alloy steel casting	Bhatawadkar & Co.Madras	0.10	-do-
17.	Failure analysis of failed pipe	Jeyapore Sugar Co.op. & Co. Madras	0.10	-do-
18.	Failure analysis of leaf spring	Hindustan Motors Ltd. Madras	0.10	-do-
19.	Failure analysis	Tamilnadu Petroproducts Ltd. Madras	0.40	-do-
20.	Residual life assessment of main steam line of boilers	Neyveli Lignite Corn.	0.34	-do-

4.11.13 Honours and Awards

S.No.	Name of Faculty	Honours/Awards	Purpose
1.	Prof.K.A.Padmanabhan	First Indian receipt of a Forschungspreis (Research Award) Alexander von Humboldt Foundation, Germany	In recognition of accomplishment in research and teaching and for scientific co-operation between India and Germany
2.	Prof.S.Sundaresan	Best paper award Panthaki Award	For the paper Effect of Weld.....
3.	Dr.Paramanand Singh Dr.N.G.Nair Mr.A.Selvam	Best paper award during NMD 1994 Visakhapatnam	For the paper "Synthesis and ..
4.	Dr.Paramanand Singh	Member of the Editorial Board of Transaction of powder Metallurgy Assn. of India	-
5.	Prof.R.Vasudevan	Elected as Professor Emeritus by AICTE	For his outstanding contribution to teaching, research and Design of Number of industrially useful gadgets

4.11.14 Research Publications

1. P.B.S.N.V. Prasad, R. Vasudevan and S.K. Seshadri: Preparation of composite coatings in ultrasonic field Ind. J. Engg. and Matls. Sci., VI, June 94, 158-160
2. P.B.S.N.V. Prasad, R. Vasudevan and S.K. Seshadri:Effect of ultrasonic agitation on the surface finish of electro-deposits Ind. J. Engg. and Metals. Sci., VI, June 94, 178-180
3. P.B.S.N.V. Prasad, S.Ahila, R.Vasudevan and S.K.Seshadri:Fatigue strength of nickel electrodeposits prepared in Ultrasonically agitated bath J. Mat. Sci. (letters)., 13, 1994, 15-16

4. Effect of ferrite transformation on the tensile and stress corrosion properties of type 316L stainless steel weld metal thermally aged at 873K. S.K.Seshadri, M.S. Prasad, S.K.Seshadri, J.B.Gnanamoorthy and P.Rodriguez. *Metal. Trans. A*, 1994, 25A.
5. Environment resistant nickel based electrocomposites. S.Balathandan and S.K.Seshadri. *Bull. Electrochem.*, 1994, 10(9- 10), 392-394.
6. Polarisation behaviour of nickel-based electrocomposites. S.Balathandan and S.K.Seshadri. *Metal Finishing*, Feb. 1994, P.49- 50.
7. Preparation of composite coating in Ultrasonic field. PBSNV Prasad, R. Vasudevan and S.K.Seshadri, *Indian J. Engg. and Materials Sci.*, 1994, Vol.1, 158-160.
8. Effect of Ultrasonic agitation on surface finish of electro- deposites. PBS Prasad, R. Vasudevan and S.K. Seshadri. *Indian J. Engg. and Materials Sci.*, 1994, Vol.1, 178-180.
9. Electrochemical Impedance study of nickel electrodeposites prepared in Ultrasonically agitated bath. PBSNV Prasad, S. Ahila, R. Vasudevan and S.K. Seshadri. *Indian J.Chem. technology*, 1994, Vol.1, 127-128.
10. Influence of various factors of electro-co-deposition on composite plating of silicon nitride with cobalt. in *Bulletin of Electrochemistry*.E.P. Rajiv, Amita Iyer and S.K. Seshadri.
11. Tribological properties of cobalt-partially stabilised zirconia (PSZ) composites in dry sliding conditions. in *WEAR*. E.P.Rajiv, Amita Iyer and S.K. Seshadri
12. Corrosion characteristics of cobalt-silicon nitride electro composites in various corrosive environments in *Materials chemistry and Physics* E.P. Rajiv, Amita Iyer and S K. Seshadri
13. S. Ahila, S. Ramakrishna Iyer and V.M. Radhakrishnan, Creep life estimation of 2.25Cr- 1Mo steel weld joints by a parametric method. *Ind. J. Engg and Material Science* 1 (1994) pp. 48 - 52.
14. S. Ahila, S. Ramakrishna Iyer and V.M. Radhakrishnan, Creep deformation of induction pressure welded 2.25 Cr-1Mo steel. *Intl. J. Pressure Vessels Piping.*, 57 (1994)pp. 327-330
15. S. Ahila, S. Ramakrishna Iyer and V.M. Radhakrishnan Comparative study of creep behaviour of 2.25Cr-1Mo steel and its weldments. *Intl. J. Pressure Vessels Piping*, 58 (1994)
16. S. Ahila, S. Ramakrishna Iyer and V.M. Radhakrishnan Environmental attack of 2.25 Cr- 1Mo steel *Bulletin of Electrochemistry*, (1994)
17. S. Ahila, S. Ramakrishna Iyer and V.M. Radhakrishnan, High temperature stability of 2.25Cr- 1Mo steel during creep. *Materials at High Temperature*, 12(1), (1994)pp. 5-11.
18. S. Ahila, S. Ramakrishna Iyer and V.M. Radhakrishnan, Measurement of hot corrosion of 2.25Cr-1Mo -347 H welded joints in K₂S₀₄-NaCl mixture. *Mater. Lett.*, 18 (1994) pp 243-245
19. S. Ahila, S. Ramakrishna Iyer and V.M. Radhakrishnan, Remanent creep life assessment of boiler tube material and its weld joint. *Trans. Ind. Inst. Metals.*, 47(5) (1994) pp. 307-316.
20. S. Ahila, P.B.S.N.V. Prasad, S. Ramakrishna Iyer and V. M. Radhakrishnan. Carbide precipitation in 2.25Cr-1Mo steel and its weldment during creep testing. *Mater Letters.*, 20 (1994) pp 107 - 111.
21. S. Ahila, S.Ramakrishna Iyer and V.M.Radhakrishnan, Hot corrosion of 2.25Cr-1Mo boiler tube steel and its weldment - Part I Thermogravimetric and metallurgy study. *Trans. Ind. Inst. Metals*, 47 (2), (1994) pp. 169 - 182.

22. S. Ahila, S. Ramakrishna Iyer and V.M. Radhakrishnan, Hot corrosion of 2.25Cr-1Mo boiler tube steel and its weldment - part II Corrosion Mechanism. Trans Ind. Inst. Metals., 47 (2), (1994) pp. 183-191.
23. V.K. Saxena, M.S.G. Krishna, P.S. Chhaunker and V.M. Radhakrishnan, Fatigue and fracture behaviour of a nickel- chromium free austenitic steel. Inter J. Pressure Vessels Piping, 60(2) (1994) pp 151-157
24. V.M. Periasamy, S.D. Pathak and V.M. Radhakrishnan, Effect of heat treatment on the tensile and fracture toughness behaviour of Al-Mg-Si alloy. Trans Ind. Inst. Metals., 47(2), (1994) pp. 145-151.
25. V.K. Saxena, N. Moideuddin and V.M. Radhakrishnan. Electron beam irradiation effects on fatigue crack growth resistance in an austenitic steel. Inter. J. Fatigue, 16 (Oct 1994) 479 - 484.
26. V.K. Saxena, M.S.g. Krishna and V.M. Radhakrishnan, Fatigue crack growth behaviour of a Ni-C free austenitic steel. Int. J Pressure Vessels Piping, 60, (1994)
27. V.K. Saxena, G. Malakondaiah and V.M. Radhakrishnan, Influence of specimen configuration and loading history on fatigue crack growth behaviour of 2024-T3 clad aluminium alloy. Engg. Fracture Mechanics, 47, (1994)
28. N. Sivaramakrishnan, K.S. Raja, K. Prasad Rao, Effect of PWHT on Weld Metal Impact Toughness of a Semi - Austenitic PH Stainless Steel, Welding Journal (AWS), 73, 1994, p.200s
29. K. Prasad Rao, P. Nageshwar Rao, Comparative Evaluation of Weld Metals Deposited Using C-Mn and Low Alloy Filler Wires, Practical Metallography (German and English), 31, 1994, p.89.
30. K. Prasad Rao, H. Sabat, U. Dilthey, J. Grobecker, Effect of welding Thermal Cycles and Subsequent Heat Treatment on the Corrosion Behaviour of Electroslag Cladding made of Duplex Steel, Welding and Cutting (German), 46, 1994, p.155.
31. K. Prasad Rao, H. Sabat, U. Dilthey, J. Grobocker, Auswirkungen des Schweißwärmezyklus und Nachfolgender Wärmebehandlung auf das Korrosionsverhalten Von Electroslagband Plattierungen aus Duplex stahl, Schweißen Und Schneiden, 46, 1994, p.442.
32. K. Prasad Rao, R. Dighde, Ch. Radhakrishna, Effect of Heat Input and PWHT on Microstructure and Toughness of T-1 Steel Welds, Practical Metallography, 31, 1994, p.360.
33. B. Guha, * Fatigue life estimate of C-Mn steel welded cruciform joints, Theoretical and Applied Fracture Mechanics, 21 (1994) 121-129.
34. V. M. Periaswamy, S.D. Pathak, V.M. Radhakrishnan, "Effect of Heat-Treatment on the Tensile and Fracture Toughness Behaviour of Al-Mg-Si Alloy", Trans, IIM, V.47, 145-151, Nos.2-3, April -June 1994.
35. V. M. Periasamy, S. Sundararajan, S.D. Pathak, V.M. Radhakrishnan, "Effect of Welding and Post-Weld Heat-Treatments on the Tensile & Fracture Toughness Behaviour of Al-Mg-Si Alloy", Trans. IIM, 1995
36. R. Ambardar, O. Prabhakar and S.D. Pathak, "Ultrasonic Test Techniques to Characterise the Fatigue Properties of Materials - an overview", journal of Non-Destructive Evaluation, V.13, Nos.1-4, Special Volume 1994.
37. P. Shanmugam, B. Jana, S.D. Pathak, "Dynamic Fracture Toughness (DFT) of Banded HSLA Steels", journal of Testing and Evaluation, JTEVA, V23, No.1, January 1995, PP 11 - 18.

38. S. Raghavan, Gibbs energy of formation of LaNi O₃ using a calcium fluoride solid electrolyte galvanic cell. *Trans. IIM.* 47, 197-198, 1994.
39. J. Swaminathan & S. Raghavan, Vanadic hot Corrosion Creep Interaction of Superm C-276. *High Temperature Materials & Processes.*
40. D. Ravikumar, A. Sen, K. Swaminathan, "The formality and feature level of a recent automotive stamping grade Al-Mg-Mn alloy". *J. Materi Sci. Letti.* 13 (1994) 971-973
41. K. Swaminathan, A. Nandy and D. Ravikumar, study on the elevated temperature tensile superplastic flow behaviour of a new Canadian Al-Mg-Mn alloy, its room temperature formality and feature profile". *Materials Science Forum* 170-172 (1994) 287- 292.
42. K. Swaminathan, A. Nandy and R. Vasudevan, "Elevated temperature tensile flow and fracture behaviour of a recently developed Canadian Al-Mg-Mn alloy" *J. Materi. Sci. Lette.* (1995).
43. P. Sampath Kumar and P. Kesavan Nair: "Effect of Phosphorus Content on the Relative Proportions of Crystalline and Amorphous Phases in Electroless Ni-P Deposits", *Journal of Materials Science Letters*, 13, pp 671-674, 1994.
44. P. Sampath Kumar and P. Kesavan Nair: "XRD Studies on the Relative Proportion and Decomposition of Amorphous Phase in Electroless Ni-B Deposits", *NanoCrystalline Solids*, voi4, No.2, pp 183-198, 1994.
44. P. Sampath Kumar and P. Kesavan Nair: "Crystallization of Electroless Ni-P-B Deposits", *Plating and Surface Finishing*, 81, pp 96-100, 1994.
45. K. Swaminathan and R. Manoj "Elevated temperature deformation behaviour of a Finish-made Al-Zn-Mg alloy for strategic application". *Trans. Indian Institute of Metals* (1995).
46. S. Ganesh Sundara Raman and K.A. Padmanabhan, 'Tensile Deformation - induced Martensitic Transformation in AISI 304 LN Austenitic Stainless Steel' *J. Mater. Sci. Letters.* 13 (1994) 389-392.
47. 'Room Temperature Low Cycle Fatigue Behaviour of a Ni - base Superalloy' S. Ganesh Sundara Raman and K.A. Padmanabhan, *Int. J. Fatigue*, 16 (1994) 209-215.
48. 'Influence of Martensite Formation and Grain Size on the Room Temperature Low Cycle Fatigue Behaviour of AISI 304 LN Austenitic Stainless Steel'. S. Ganesh Sundara Raman and K.A. Padmanabhan, *Materials Science and Technology*, (10) 1994 614-620
49. 'Deformation Behaviour of Hot Rolled Low Carbon Steel Sheets: The Effects of Sheet Thickness and Modes of Testing on Formability' P.P. Date and K.A. Padmanabhan. *J. Mater. Sci. Letters*, 13 (1994) 795-798.
50. 'Effect of Surface Roughness on the Room Temperature Low Cycle Fatigue Life of Alloy Nimonic 90' S. Ganesh Sundara Raman and K.A. Padmanabhan, *J. Mater, Sci. Letters*, 13 (1994) 708-710.
51. 'Some Studies on the Incremental Step (Fatigue) Test' S. Ganesh Sundara Raman and K.A. Padmanabhan, *Mater. Sci. Enq.*
52. Optimisation of Composition and Rolling Parameters in case of Extra Deep Drawing Low Carbon Al-Killed Steel Sheets' R.K.P. Singh, K.A. Padmanabhan and S. Mishra, *American Society of Mechanical Engineers (ASME) Transactions - Journal of Engineering for industry, Conferences and Proceedings.*

53. Y.M. Fazil Marickar, S.Anitha, R.Girija and R.Vasudevan: IR Analysis vs XRD studies of mixed urinary stones Sixth National Seminar on Crystal Growth (Org. Crystal Growth Centre of Anna University, AC College Campus, 2-4 Feb. 1995).
54. R. Vasudevan and Y.M. Fazil Marickar: Computerised XRD study of urinary stones - some advances Sixth National Seminar on Crystal Growth (Org. Crystal Growth centre of Anna University, AC College Campus, 2-4 Feb. 1995)
55. Polarisation and Passivation properties of cobalt composites. Amita Iyer, E.P. Rajiv and S.K. Seshadri. Fifth International Symposium on Advances in Electrochemical Science and Technology. 24-26 Nov., 1994. Madras, India.
56. Tribological properties of cobalt-ceria composite coating. Amita Iyer, E.P. Rajiv and S.K. Seshadri. 1bid.
57. Corrosion of copper deposits from acid containing additives with direct and pulse current. G. Devaraj and S.K. Seshadri. 1bid.
58. Effect of area on the bimetallic corrosion of a structural steel in chloride environment. Amita Iyer, E.P. Rajiv and S.K. Seshadri. 48 Annual Technical meeting of IIM at Visakhapatnam 14- 17 Nov., 1994.
59. Oxidation resistance of Co composites Amita Iyer, E.P. Rajiv and S.K. Seshadri. 1bid.
60. Ch. Radhakrishna, K. Prasad Rao Impact Toughness of Electron Beam Welds of Indigenously Developed Ti-6Al-4V (ELI Gr.), National welding Seminar, Jamshedpur, 1994.
61. P. Sampath Kumar and P. Kesavan Nair: 'Relative Stability of Amorphous Phase in Ni-P and Ni-B Electroless Deposits on Annealing', Proc. International Conf. on Thermal Treatment of Materials, ICTTM-95, Organised by ASM International, India Chapter, Feb. 3-6, 1995. Ed. P. Ramakrishnan.
62. A.S. Varadarajan, B. Ramamoorthy and P. Kesavan Nair: 'Influence of Thermal Relief of Residual micro and macro Strains on the Corrosion Behaviour of Ground Finished Carbon Steels', Proc. International Conf. on Thermal Treatment of Materials, ICTTM-95, Organised by ASM International, India Chapter, Feb. 3-6, 1995. Ed. P. Ramakrishnan.
63. S. Suresh, K. Asogan, V.P. Raghupathy, P. Kesavan Nair, and R. Vasudevan: 'Influence of Multiple Stress Relieve Treatment on the Mechanical Properties of QT Steel Weldments', Proc. International Conf. on Thermal Treatment of Materials, ICTTM-95, Organised by ASM International, India Chapter, Feb. 3-6, 1995. Ed. P. Ramakrishnan.
64. P. Venkateswara Rao, B. Ramamoorthy and P. Kesavan Nair: 'A Study on the Interlayers in Interference Fits', Proc. 16th All India Manufacturing Technology Design and Research Conference, Dec. 8- 10, 1994, Organised by central Manufacturing Technology Institute, Bangalore - 560 022, Allied Publishers Ltd., Ed. M.V. Surya Prakash et al. pp 296-304.
65. A.S. Varadarajan, B. Ramamoorthy and P. Kesavan Nair: 'An Investigation on the Residual Stresses induced by Surface Grinding', 16th All India Manufacturing Technology Design and Research Conference, Dec. 8-10, 1994, Organised by Central Manufacturing Technology Institute, Bangalore - 560 022, paper mp 17, pp 296-304.
66. P. Shanmugam, S.D. Pathak, " Dynamic Fracture Toughness (DFT) Characterisation of Multipass MMA Welded Microalloyed Steel", IIM - ATM 94 (poster session), 14-17 Nov. 1994, Visakhapatnam.

67. K. Srinivasa Rao, V.M. Radhakrishnan, S.D. Pathak, "Some Studies on Mechanical Behaviour of PHSS (Martensitic) and its Weldments", IIM - ATM 94, (oral presentation), 14 - 17 Nov. 1994, Visakhapatnam.
68. P. Shanmugam and S.D. Pathak, "Static Fracture Toughness Behaviour of Microalloyed Steel and its MMA Weldment", Accepted for 'MICROLOY - 95' - All India Seminar on 'Microalloyed Steel - Emerging Materials for Engineering Industries', April 7 - 8, (10th National Convention Metallurgists and Material Scientists), Institution of Engineers, Jamshedpur, 1995.
69. V.M. Radhakrishnan. An energy based analysis of thermomechanical fatigue. Proc. Sym. on Creep Fatigue Interaction. IGCAR, Kalpakkam., Vol 1 (1995), pp. I 82 - I 101.
70. Vikas Kumar Saxena, G. Malakondaiah and V.I.I. Radhakrishnan. Crack closure Maps. *ibid.* (1995), pp. C 39 - C 45.
71. M.S. Gopala Krishna, A.M. Sreenivasa Murthy and V.M. Radhakrishnan. DC - PD Technique for crack monitoring in creep crack propagation study. *ibid* (1995), pp. C 109 - C - 119.
72. Kulvir Singh, S.C. Bose, K.M. Chawdury and V.M. Radhakrishnan. Creep crack propagation in steam turbine casing casting steel. *ibid*, (1995), pp. C 72 - C 81.
73. A. Selvam, Dr N. G. Nair and Dr Paramanand Singh, "Synthesis and characterisation of SiC whiskers by the Carbo thermal reduction of silica", presented at the symposium on composites for High Temperature Applications - Recent developments, Hyderabad, Sep. 6, 1994.
74. K. Swaminathan, A. Nandy and D. Ravikumar "A study on the elevated temperature tensile superplastic flow behaviour of a new canadian Al-mg-Mn alloy, its room tem. formality and texture profile. - Presented as a poster paper in the Int. Conf. on superplasticity in Advanced Materials (ICSAM - 94) held in Moscow, May 21-24, 1994.
75. D. Ravikumar, K. Swaminathan and A.K. Singh "Texture effects and formality of an Al-Li-Cu alloy sheet". Presented as an oral paper in the Annual Technical Meeting of the Indian Institute of Metals held in Visakhapatnam, Nov. 15-17, 1994.
76. 'On the Physical Nature of Optimal Superplastic Flow' K.A Padmanabhan, International Conference on Superplasticity in Advanced Materials, Moscow, May 1994.
77. 'On the Experimental Verification of an Atomistic Model for Boundary Sliding Controlled Optimal Superplastic Flow' S.S. Bhattacharya and K.A. Padmanabhan, International Conference on Superplasticity in Advanced Materials, Moscow, May 1994.
78. Phenomenological and Mechanistic Approaches to Optimal Structural Superplasticity' S.S. Bhattacharya and K.A. Padmanabhan, Sixth International Symposium on Plasticity of Metals and Alloys (ISPM6), Prague, Sep. 1994.
79. Optimisation of Composition and Rolling Parameters in case of Extra Deep Drawing Low Carbon A1-Killed Steel Sheets' R.K.P. Singh, K.A. Padmanabhan and S. Mishra, ASME Winter Annual Meeting, 1994, Chicago, Nov. 13-18, 1994.

4.12 Ocean Engineering Centre

4.12.1 Introduction

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

Structural analysis, Design and Testing
Wave Hydrodynamics
Floating and Submerged Bodies
Marine Geotechniques
Material in Ocean Environment
Ocean Energy
Naval Architecture
Sea bed mining
Underwater instrumentation

4.12.2 Details Faculty

Name and Qualification	Major area of Specialisation
Professors	
M.R.Pranesh, Ph.D.(IISc.)(Head)	Structural-soil-wave interaction studies, Coastline studies, Behaviour of materials in ocean environment
C.Ganapathy, Ph.D.(IIT Madras)	Analysis and design of offshore and ship structures
S.Narasimha Rao, Ph.D.(IISc.)	Marine geotechnical engineering, Seabed soil characteristics understatic and dynamic loads
V.S.Raju, Dr.Ing.(Karlsruhe) (On lien to IIT Delhi)	Marine geotechnical engineering, Foundation design for onshore and marine structures, Ocean Engg.
M.Ravindran, Ph.D.(IIT Madras) (On lien to NIOT)	Turbomachines, pumps, Hydraulic turbines, Ocean Energy
C.P.Vendhan, Ph.D.(IIT Kanpur)	Computer aided analysis of ocean, Civil and Aerospace structures, Dynamics of floating bodies and structures
K.Muthukrishnaiah, Ph.D.(IIT Madras)	Marine geotechnical engineering, Analysis and, civil & aerospace structures, Dynamic of design of foundation for offshore and onshore structures
Associate Professors	
K.Ganesh Babu, Ph.D.(IIT Madras)	Analysis and design of ocean structures, Behaviour of Material fatigue and in Ocean Environment
V.G.Idichandy, Ph.D.(IIT Madras)	Experimental techniques, Instrumentation, Analysis and testing of structural models and prototypes
R.Mahadevan, Ph.D.(IISc.)	Physical oceanography, Ocean wave hydrodynamics
K.Rajagopalan, Ph.D.(IIT Madras)	Computer aided analysis, Design of ship, underwater and offshore structures, Reinforced and prestressed concrete structures

Name and Qualification

R.L.Roy Choudhury, Ph.D.(IIT Madras)

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

SP.Subramanian, Ph.D.(IIT Madras)

Assistant Professors

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

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

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

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

P.Sambandam, M.S.(IIT Madras)

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

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

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

Major area of Specialisation

Ship motions and maneuvering, Ship propulsion & resistance, Design of small crafts & fishing vessels

Wave-structure interaction, Coastal Erosion of shore protection, Fluid flow problems

Geological oceanography, Engineering geology

Computer aided structural analysis, Analysis of motion floating bodies, Model studies

Naval architecture, Ship model testing

Hydraulic and numerical modelling of Coastal and offshore Processes

Ship design, Ship production and planning

Ship design, ship structures, Computer Applications in ship design

Computer aided analysis, design and experimental studies of coastal and offshore structures

Wave energy, Hydrodynamics, Oceanographic measurements

Experimental and theoretical hydrodynamics, Wave structure interaction, Wave energy, Fluid Mechanics

4.12.3 Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D	3	1	7	-	4	-	5	-	6	-	25	1	26
M.S.	4	-	2	-	1	-	-	-	-	-	07	-	07
M.Tech	10	1	3	-	-	-	-	-	-	-	13	1	14
B.Tech	19	2	19	-	18	-	16	-	1	-	73	2	75
Total	36	4	31	-	23	-	21	-	7	-	118	4	122

4.12.4 Number of Scholarships/Fellowship Holders

Programme	Institute	Others	Total
Ph.D	17	2	19
M.S.	7	-	7
M.Tech	14	-	14
Total	38	2	40

4.13.5 Number of Degrees Awarded

Programme	Number
Ph.D	6
M.S.	5
M.Tech	7
B.Tech	11
Total	29

4.12.6 New Facilities added and Major Equipment Procured

1. MacReflex system for motion measurement of floating bodies using 3 cameras & IR light sources on the object.
2. Workstations (DEC ALPHA 300 LX) for high volume computing.

4.12.7 Short-term Course/Workshop/Seminars/Symposia/Conferences organised

S.No.	Co-ordinator(s)	Title of Course/Workshop/Seminar/Symposia/Conference	Period
1.	Prof.M.R.Pranesh Prof.S.Narasimha Rao Dr.V.Sundar	Inter Institutional Course and Workshop on Dredging, Port, Coastal Engineering	Jan. 23-31 1995
2.	Dr.V.G.Idichandy Prof.V.Paramasivam Dr.S.Swarnamani Dr.Mehr Prasad	Workshop - Vibration Testing Facilities - along with Departments of Civil Engineering and Applied Mechanics	Mar. 27- 28 1995

4. 12.8 Special Lectures Delivered

S.No.	Name of Faculty	Topic of Lecture	Delivered at	Date
1.	Dr.V.Sundar	Coastal Erosion and Protection	Madras	Jan. 23- 31 1995
2.	Dr.J.S.Mani	Wave generation and propagation	Malta	April 18-June 10 1994
		Coastal Process	-do-	-
		Coastal erosion and protection	-do-	-
		Port planning and development	-do-	-
3.	Dr.J.S.Mani	Dynamic Marine Environment	CECRI-Madras	Feb. 1995
4.	Prof.M.R.Pranesh	Marine corrosion and control	NIPM Madras	Several times
5.	Dr.V.G. Idichandy	Role of Physical Models in Design	REC Calicut	Mar. 20 1995

The Faculty of OEC have delivered several lectures at the short term courses organised by IOI, operational Centre, India

4.12.9 Visits Abroad

S.No.	Name of Faculty	Country visited	Date	Purpose of visit
1.	Dr.V.Sundar	Germany IGAW. Bergische Univ. Wuppertal	May- June & Dec. 1994	DFG Project

S.No.	Name of Faculty	Country visited	Date	Purpose of visit
2.	Dr.J.S.Mani	Malta IOI	Apr.18-June 10 1994	Delivering lectures & attending the Training Programme
3.	Dr.V.G.Idichandy	Singapore Univ. of Singapore	Oct.1993-July 1994	Visiting Scientist

4.12.10 Distinguished Visitors to the Centre

S.No.	Name of the Visitor and Occupation	Date of visit	Purpose of visit (Lecture/Discussion)
1.	Mr.M.Victor Mendis Chairman, National Engineering Research and Development Centre, Srilanka	22.09.94 to 24.02.95	Discussion
2.	Mr.Bernard Wood Head of Aid Review Division of OECD	05.01.95	Discussion

4.12.11 Sponsored Projects

S.No.	Title	Period	Funding Agency	Amount (In lakhs)	Co-ordinator(s)
1.	Development of numerical models for prediction of nearshore phenomena	1992-95	Dept. of Ocean Dev.	9.00	Dr.J.S.Mani Dr.V.Sundar
2.	Wave and current forces on group of piles with emphasis on full scale field measurements	1993-96	Dept. of Ocean Dev.	25.00	Dr.S.Meenakshi-sundaram Dr.J.S.Mani
3.	Coastal Marine Aquaculture	1992-95	Dept. of Ocean Dev.	3.00	Dr.J.S.Mani
4.	Sea Trial of a 150 kw wave power plant off Trivandrum Coast	1985-95	Dept. of Ocean Dev.	400.00	Dr.S.Neelamani Prof.N.V.C.Swamy Prof.V.S.Raju Prof.M.Ravindran Dr.P.M.Koola
5.	Site specific studies and optimisation of wave energy systems as breakwater	1991-95	Dept. of Ocean Dev.	10.00	Prof.V.S.Raju Prof.M.Ravindran Dr.S.Neelamani
6.	Development of 3-component 5 stage velocity probe for lab and field use	1995-97	NIOT	18.30	Dr.V.G.Idichandy Prof.C.P.Vendhan
7.	Detached breakwater as a shore protection measure	1995-97	NIOT	4.18	Dr.V.Sundar
8.	Finite Element analysis of underwater structures	1993-95	Dpt. of Atomic Energy	4.21	Dr.S.K.Bhattachrya Prof.C.P.Vendhan

S.No.	Title	Period	Funding Agency	Amount (In lakhs)	Co-ordinator(s)
9.	Loads on inclined cylinders due to steep waves and currents	1995-96	German Science Foundation (DFG)	DM 86,250	Dr.V.Sundar Dr.P.M.Koola

4.12.12 Major Consultancy Assignments

S.No.	Title	Organisation	Amount (In Lakhs)	Coordinator(s)
1.	Development of offshore platform structures using core loaded sleeved column system	Tube Products of India	3.00	Prof.C.Ganapathy
2.	Design of Fishing Harbour & LPG terminal	Gopalpur Port Trust	4.00	Prof.C.Ganapathy Dr.R.Sundaravadivelu
3.	Sea water intake system	Nagarjuna Aquaculture Farm at Nellore	2.50	Prof.V.S.Raju Dr.J.S.Mani R.Natarajan
4.	Evaluation of design basis flood level for PFBR	Atomic Res. Centre, Kalpakkam	1.80	Dr.J.S.Mani Dr.R.Mahadevan
5.	Unloading facility of Ennore coast	SPIC	2.00	Prof.V.S.Raju Dr.J.S.Mani
6.	Design of submarine pipeline and ship mooring system	Southern LPG Madras	6.00	Prof.V.S.Raju Prof.P.K.Aravindan Dr.R.Natarajan Dr.S.Neelamani
7.	Design of sea water intake structure and shore protection for Aquaculture	Cambay Aqua Tech Ltd. Baroda	2.50	Prof.V.S.Raju Dr.S.Neelamani Dr.J.S.Mani
8.	Marine Facilities for Import/Export of petroleum products	Reliance Petroleum Ltd. Jamnagar Gujarat	2.00	Prof.V.S.Raju Dr.S.Neelamani Dr.R.Natarajan and others
9.	Design of offshore terminal for import of liquid cargo	SPIC Madras	2.50	Prof.V.S.Raju Dr.R.Natarajan Dr.J.S.Mani Dr.S.Neelamani and others
10.	Supply of wave and cyclone data off Madras Coast	EID Parry (India) Ltd. Madras	0.30	Prof.V.S.Raju Dr.S.Neelamani
11.	Supply advice and guidance on Metocean Data for design of offshore facility for EID Parry (I) Ltd. Madras	John Brown Engg. India (P) Ltd. Bangalore	0.80	Dr.S.Neelamani
12.	Numerical Modelling and flume investigations for Pipavav Port, Gujarat	Larsen & Toubro Ltd. Bombay	5.00	Prof.S.Narasimha Rao Dr.R.Natarajan Dr.V.Sundar
13.	Design of Sea Water Intake System	Birla Periclase Visakhapatnam	11.00	Prof.S.Narasimha Rao Dr.R.Sundaravadivelu Dr.R.Natarajan Dr.V.Sundar

S.No.	Title	Organisation	Amount (In Lakhs)	Coordinator(s)
14.	Extension of Haddow Wharf	Andaman Harbour Works	4.00	Prof.V.S.Raju Dr.R.Sundaravadivelu Dr.V.Sundar
15.	Spencer's Aquaculture Project	Spencer & Co.	1.15	Prof.S.Narasimha Rao Dr.R.Sundaravadivelu Dr.V.Sundar
16.	Design of Sea Water Intake System at Naripaiyur	Entoma Hydro Systems Madras	0.70	Prof.M.R.Pranesh Dr.R.Sundaravadivelu Dr.V.Sundar
17.	Stability of ONGC Raja pipeline	ONGC	0.30	Prof.K.Muthukrishnaiah Dr.P.M.Koola
18.	Offshore sea water intake and spent water discharge system	Birla Periclase Visakhapatnam		Prof.S.Narasimha Rao Dr.R.Sundaravadivelu Dr.V.Sundarajan Dr.R.Natarajan
19.	Stability and structural analysis of a mobile drilling platform	Aban Loyd Madras	1.00	Prof.C.Ganapathy Dr.R.Sundaravadivelu Dr.Natarajan
20.	VCM pipe line support	DCW Ltd.	0.30	Prof.C.Ganapathy Dr.R.Sundaravadivelu
21.	Wharf at Boat Basin at Madras Port Trust	Amudha Engg. Company	0.50	Dr.R.Sundaravadivelu and others

4.12.13 Honours and Awards

S.No.	Name of Faculty	Honours/Awards	Purpose
1.	Mr.Lalu Mangal Dr.V.G.Idichandy Prof.C.Ganapathy	Merit Certificate for paper presented at INCHOE 94, Pune	Neural net works in Damage Detection of offshore platforms

4.12.14 Research Publications

1. Alagusundaramoorthy, P., Sundaravadivelu, R., Ganapathy, C., "Ultimate strength of stiffened panels with cutouts under uniaxial compression", Marine Structures, pp.279-308, 1995.
2. Anand, D. and Sundar, V., Numerical Modelling of Wave Field in harbour with partially reflecting boundaries, Indian Conf., on Harbour & Ocean Engg., (INCHOE-94), Pune, pp.J65-J74, 1994.
3. Anand, D. and Sudar, V., Development and Application of numerical model for wave diffraction through Breakwater gaps, HYDROPORT, Yokosuka, Japan, pp.317-331, 1994.
4. Ganapathy, C. and Mahrenholtz, O., Hydrodynamic loads due to earth quakes in subsea storage tanks, 4th International offshore and polar engg. conference, Japan, 1994.
5. Idichandy, V.G., Ganapathy, C., Structural Integrity Monitoring - an over view., Workshop on vibration testing facilities, IIT Madras, pp.27 - 28, 1995.
6. Janardhan, K and Sundar, V., Development and application of a numerical model for shoreline simulation, HYDROPORT 1994, Yokosuka, Japan pp.1141 - 1152, 1994.

7. Jayakumar, Neelamani, S., and Raju, V.S., Dynamic Pressures on Oscillating Water Column Type Wave Energy Caisson, 9th Congress of the Asian and Pacific Division of the International Association for Hydraulic Research, Singapore, Vol.1, pp.429-437, 1994.
8. Koola, P.M., Ravindran, M., Jagadeesh Kumar, V., Performance studies on the prototype wave energy plant at Trivandrum, Indian national conf. on Harbour and Ocean Engg. (INCHOE-94), 1994.
9. Krishnankutty, P and Vendhan, C.P., Computation of hydrodynamic coefficients of a tension leg platform, in Ocean Technology perspectives, Eds: S.Kumar et al., publications and information directorate, New Delhi, 1994.
10. Lalu Mangal, Idichandy, V.G., Ganapathy,C., Neural Net works in Damage Detection of offshore platforms, INCHOE 94 Vol.1 pp.21 - 30, 1994.
11. Mani, J.S., Oumeraci, H., Muttray, M., Rundown velocity along the slope of a breakwater with an accropode cover layer, Journal of Coastal Research, U.S.A., Vol.10, No.4, pp.789-802, 1994.
12. Murali, K., and Mani, J.S., Numerical prediction of wave height distribution along the approach channel and entrance to a harbour, Published in Indian National Conference on Harbour and Ocean Engineering (INCHOE-94) Conference to be held at Poona, Proceedings VolIII, pp. J75 - J84, 1994.
13. Murali, K., and Mani, J.S., Numerical prediction of wave height distribution at the entrance to a bay, Ninth Congress of the Asian and Pacific Division of the International Hydraulic Research, Singapore, Vol.III, PP 50-57.
14. Neelamani, S. and Santhanam, M., Wave Generating Characteristics of a Long Crested Wave Maker in a Wave Basin, Workshop on underwater system and Engineering, Organised by National Science and Technological Laboratory, Vishakapatnam, pp.B122-B130, 1994.
15. Neelamani, S. and Santhanam, M., Transfer Function of Wave Generation of a Flap Type Wave Maker Due to Random Waves of Different Spectral Characteristics, 9th Congress of the Asian and Pacific Division of the International Association for Hydraulic Research, August 24-26, 1994, Singapore, Vol.1, pp.486-493, 1994.
16. Neelamani, S. and Sundar, V., Dynamic Pressures Around Twin Vertical Cylinders in Random Wave Fields, Indian National Dock, Harbour and Ocean Engineering Conference, CWPRS, Pune, 1994.
17. Neelamani, S. and Sundar, V., Dynamic Pressures around twin vertical cylinders in random wave fields, INCHOE, pp.J1204-J1204, 1994.
18. Neelamani, S. and Mahadevan, R., Flume confinement Effect on Wave Induced Dynamic Pressures on Twin Staggered Cylinders, 9th Congress of the Asian and Pacific Division of the International Association for Hydraulic Research, Singapore, Vol.3, pp.75-83, 1994.
19. Prabhavathi, C. and Vendhan, C.P., Calculation of acoustic modes of a spherical cavity by using wedge elements, Journal of Sound and vibration, Vol.172(1), pp.136-141, 1994.
20. Raju, V.S. and Nellamani, S., Ocean Energy - Technological Developments and Prospects for Commercialisation, Seminar on Ocean and Industry - Realities & Expectations, NIO, Goa, 1994.
21. Ranga Rao, A.V. and Sundaravadivelu, R, (July 1994), Effect of Configuration of piles in Dolphin, National Seminar on Design of pile group and pile cap, Indian Geotechnical Society, Madras, 1994.

22. Ranga Rao, A.V. and Sundaravadivelu, R., Computer aided design of berth structures, INCHOE-94, Pune, Vol.I, pp.B-87-B96, 1994.
23. Sannasiraj, Sundaravadivelu, R. and Sundar, V., Dynamic of floating bodies subjected to regular waves, INCHOE-94, Pune, pp.111-120, 1994.
24. Santhanam, M., and Idichandy, V.G., Instrumentation for radio control and propulsion of ship model, Workshop on underwater systems and engineering, NSTL, Vizag, pp.104-111, 1994.
25. Shankar, N.J., Cheong, H.F., Nallayarasu, S., and Idichandy, V.G., Investigation of particle kinematics around a submerged horizontal plate by particle image velocimetry, Proc. of IX Congress of Asia Pacific Division of IAHR, Singapore, pp.58-66, 1994.
26. Suchithra, N. and Koola, P.M., Wave slamming on horizontal slabs, North Congress of Asia and Pacific Division of the International Association for Hydraulic Research (IAHR), pp.24-26, 1994.
27. Sundar, V. and Mallayachari, V., Reflection characteristics of Permeable Seawalls, Coastal Engg., Vol.23, pp.135-150, 1994.
28. Sundar, V., and Mallayachari, V., Pressures due to regular and random waves on a vertical wall, Int.Sym.Waves, Canada, Vancouver, pp.1433-1442, 1994.
29. Sundar, V., Noethel, H. and Holz, K.P., Wave Directions in a Groin Field, JI. of Coastal REsearch, Vol.10, No.4, pp.839-849, 1994.
30. Sundar, V., Noethel, H. and Holz, K.P., Asymmetries in Waves and Velocities in a Groin Field, Ocean Engg., Vol.21, No.5, pp.467-487, 1994.

4.13 Physics Department

4.13.1 Introduction

As in previous years, the current year also was marked by intense academic and research activities at the Department of Physics. Apart from the usual undergraduate, postgraduate and research programs, a large number of sponsored and consultancy projects were undertaken. The highlights are summarized below:

4.13.2 Areas of Teaching and Research

The thrust areas of teaching and research were Condensed Matter Physics, Applied Optics and Photonics, Thin Film Physics, Atomic and Molecular Physics and Statistical Physics and Dynamical Systems.

The main research groups are:

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

4.13.3 Details of Faculty

Name and Qualification

Area of Specialisation

Professors

Dr.V.Balakrishnan, Ph.D(Brandeis Univ.)	Theoretical and Statistical Physics
Dr.V.Damodara Das, Ph.D (SPU, Vidyanagar)	Thin Film Materials Science and Technology
Dr.M.P.Kothiyal, Ph.D(IIT Madras)	Applied Optics
Dr.(Mrs) Maha Seshasayee, Ph.D (RPI, New York)	Condensed Matter Physics, Structural Studies in Disordered systems
Dr.Y.V.G.S.Murti, Ph.D (IIT Madras)	Solid State Physics, Photonics, Defect theory
Dr.V.R.K.Murthy, Ph.D (IIT Madras)	Microwave Physics and Materials
Dr.C.K.Narayanaswamy, Ph.D(Madras Univ.)	Spectroscopy and Optics
Dr.K.V.S.Rama Rao, Ph.D (Andhra Univ. Waltair)	Magnetism and Magnetic Materials
Dr.G.Rangarajan, Ph.D (IISC Bangalore) [Head]	Low Temperature Physics, Solid State Physics
Dr.S.B.S.Sastry, Ph.D (IIT Madras)	Solid State Physics and Cryogenics
Dr.R.S.Sirohi, Ph.D (IIT Delhi)	Optics, Holography, Speckle Phenomenon & Coherent Optics
Dr.B.M.Sivaram, Ph.D(Sussex Univ.UK)	Laser Physics, Quantum Electronics
Dr.J.Sobhanadri, Ph.D (Andhra Univ.Waltair)	Microwave Studies

Name and Qualification

Dr.K.Viswanatha Reddy, Ph.D (IIT Madras)

Area of Specialisation

Solid State Physics, Diffusion and Electromigration

Associate Professors

Dr.B.S.V.Gopalam, Ph.D(IIT Madras)

Physics of Semiconductor Devices

Dr.J.Majhi, Ph.D(IIT Madras)

Semiconductor Devices

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

Solid State Physics, Lattice Dynamics

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

Condensed Matter Physics

Dr.A.V.Narasimham, Ph.D(IIT Madras)

Acoustics and Ultrasonics, Nuclear Devices

Dr.Pranawa C.Deshmukh, Ph.D (Nagpur Univ.)

Theoretical Atomic and Molecular Physics

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

X-ray Crystallography, Educational Technology

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

Electro Optics, Dielectrics

Dr.Y.Syamasundara Rao, Ph.D(IIT Madras)

Dielectrics, Electronic Instrumentation

Assitant Professors

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

Solid State Ionics

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

High Energy Physics, Chaos, Field Theory

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

Magnetism and Magnetic Materials

Dr.V.S.Murty, Ph.D(IIT Madras)

Solid State Physics, Magnetic Resonance

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

Conducting Polymers, Molecular electronics, Instrumentation

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

Lasers and Spectroscopy Nonlinear Optics

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

Metal Hydrides, NQR

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

X-ray Crystallography

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

Semiconductor Devices, Photovoltaics

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

Low Temperature Physics, Superconductivity Cryogenics

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

Applied Optics, Holography, Optical Prod. Technology, Optical Instrumentation

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

Photonics, Solid State Physics

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

X-ray Crystallography

Chief Design Engineer

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

Optical Instrumentation, Lens Design

Senior Scientific Officer Gr.II

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

Thermal Expansion of Materials by Optical Methods

Visiting Faculty

Dr. Santaram Chilukuri Purdue University, USA

4.13.4 Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D	5	2	10	3	6	1	11	1	10	6	42	13	55
M.Tech (Solid state Physics)	8	1	-	-	-	-	-	-	-	-	08	01	09
M.Tech (Transducer Technology)	5	-	-	-	-	-	-	-	-	-	05		05
M.Sc	22	3	7	8	-	-	-	-	-	-	29	11	40
Total	40	6	17	11	6	1	11	1	10	6	84	25	109

4.13.5 Number of Scholarship/Fellowship holders

Programme	Institute	Others	Total
Ph.D	36	12	48
M.Tech	9	-	9
M.Sc	13	-	13
Total	58	12	70

4.13.6 No. of Degrees Awarded

Programme	Number
Ph.D	5
M.Sc	29
M.Tech	6
Total	40

4.13.7 Instruments/Equipments Designed and New Methods Developed

1. Vibrating reed apparatus to measure low frequency sound velocity and internal friction in materials.
2. Set-up for measurement of thermoelectric and electrical properties as functions of temperature
3. A new method for the study of electromigration in ternary semiconductor films.
4. Scanning optical confocal microscope.
5. 150 mm Schlieren system for flow visualization.
6. Time-resolved measurement for the study of semiconductor carrier lifetimes.
7. Photoacoustic spectrometer
8. Autocorrelator for measuring picosecond laser pulses
9. Pulse-selecting spectrometer.
10. Two-stage peak detector as a replacement for a high frequency storage oscilloscope.
11. Q-switched Nd:Yag laser.

4.13.8 New Facilities added and Major Equipment Procured

1. Vacuum coating system for laser flash photolysis.
2. High temperature furnace.
3. New facility for tracer scanning using gamma ray spectrometer.
4. Vacuum coating unit 15".

5. Zygo interferometer.
6. Diode laser pumped Nd:Yag laser.
7. HCL-HP Apollo computer work station
8. Cryodyne closed cycle cryogenerator.

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

SI.No	Title of Course/Workshop/Seminars/Symposia/Conf.	Duration
1.	One-day seminar on Optical processes in materials	5 Sept 1994

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

SI.No	Name of the Faculty	Title	Period/Duration
1.	Dr.R.S.Sirohi	Intl. Conf. Interferometry Warsaw, Poland	May 13-20 1994
2.	Dr.R.S.Sirohi	National Laser Symposium IRDE Dehradun	Feb.10-14 1995
3.	Dr.R.S.Sirohi	22nd National symposium on Optics & Opto Electronics CSIO, Chandigarh	March 29-31 1995
4.	Dr.D.K.Sharma	22nd National symposium on Optics & Opto Electronics CSIO, Chandigarh	March 29-31 1995
5.	Dr.V.V.Rao	22nd National symposium on Optics & Opto Electronics CSIO, Chandigarh	March 29-31 1995
6.	Dr.V.Damodara Das	National symposium on Electronics Materials	
7.	Dr.J.Sobhanadri	Humboldt Fellowship Re-invitation	July- Sept.1994
8.	Dr.B.S.V.Gopalam	National conference on thin film processing & applications	Jan. 1995
9.	Dr. B.S.V.Gopalam	National conference on Development in electronic materials and their appl.	March 1995

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

SI.No.	Name of the Faculty	Topic of the Lecture	Delivered at	Date
1.	Dr.V.R.K.Murthy	Microwave characterization of RAMs	NCML Bombay	8-12-94
2.	Dr. R. S. Sirohi	Improved collimation testing techniques	Laser Technology section Emden	14-6-94
3.	Dr. R. S. Sirohi	Two beam coupling interferometer	Oldenburg Univ.	24-6-94
4.	Dr.R.S.Sirohi	Deformation studies. Interferometer	Int.Conf.Interferometry	16-5-94
	Dr. R. S. Sirohi	Phase shifting - A testing affair	Int.Conf.CEOT 94	20-7-94
6.	Dr.R.S.Sirohi	Holographic Optical elements and their applications	National laser symposium	11-2-95
7.	Dr.B.S.V.Gopalam	Quantum well lasers	Berhampur Univ	Oct 94
8.	Dr.B.S.V.Gopalam	Bulk to low dimensional Semiconductors	Shivaji Univ.	March 1995

Sl.No.	Name of the Faculty	Topic of the Lecture	Delivered at	Date
9.	Dr. B.S.V.Gopalam	Quantum Mechanics for nano Physics and nano Chemistry of Semiconductors	Maths Dept. IIT-M	21-4-94
10.	Dr.B.S.V.Gopalam	Quantum dot lasers	Andhra Univ.	6-5-94
11.	Dr.V.Ramachandran	Phonons in materials	ISTE Summer school at Anna Univ.	Dec.1994
12.	Dr.A.V.Narasimham	Bulk viscosity and Ultrasonic wave propagation in liquids	Nagpur Univ.	April 1994
13.	Dr.A.V.Narasimham	Ultrasonic wave propagation in liquids	Maths Dept. IITM	April 1994
14.	Dr.G.Rangarajan	Transport and magnetic properties of conducting polymers	Loyola college Madras	Feb.1995
15.	Dr.G.Rangarajan	High Tc Superconductors	ISTE Summer School at Anna Univ.	Dec.1994
16.	Dr.B.M.Sivaram	Rare earth--doped fibre lasers and applications	IISC Bangalore Int. Conf. on Emerging Optoelectronic Tech.	-
17.	Dr.K.V.S.Rama Rao	Effect of Hydrogen on the Magnetic Properties of HO ₂ Fe ₁₇	Intl.Conf.on magneto-electronics Japan	1994

4.13.12 Visits abroad

Sl.No.	Name of the Faculty	Country Visited	Date	Purpose of Visit
1.	Dr.K.V.Reddy	France	27-5-94 to 8-7-94	Professional visit to Univ. of Rennes
2.	Dr.R.S.Sirohi	Germany	May-June 1994	Indo-German project
3.	Dr.R.S.Sirohi	Poland	May 16-20 1994	Intl.Conf. on Interferometry
4.	Dr.J. Sobhanadri	Germany	July-Sept. 1994	AvH Fellowship Liquid crystal studies
5.	Dr.Y.V.G.S. Murti	France	5-8 July 1994	Intl. Conf. on Defects
6.	Dr.K.V.S.Rama Rao	Japan	Nov.94	Intl. Conf.on Magneto-electronics
7.	Dr.G.Rangarajan	France	9 July 1994	Intl. Conf.on materials and mechanisms of superconductivity
8.	Dr.V.Balakrishnan	Belgium,,USA	May-July 1994	Research collaboration on chaos, nonlinear dynamics etc.

**4.13.13 Distinguished visitors to the Department
(Important Dignitaries above the level of Professors)**

Sl.No.	Name of the Visitor	Date of Visit	Purpose of Visit (Lectures/Discussion)
1.	Prof. Klaus von Klitzing Nobel Laureate Max Planck Inst. Stuttgart	Jan 1995	Invited talk
2.	Prof. Jean Phibert	21-23 Nov 94	lecture and discussion
3.	Prof. B.S. Rawat Univ. of Nevada USA	July 1994	lecture and discussion
4.	Prof. Ramakanth Srivastava Univ. of Florida USA	July 1994	lecture and discussion
5.	Prof. T.P. Das Univ. of Albany USA	Jan 1995	lecture and discussion
6.	Prof. S.D. Mahanthy Michigan State Univ. USA	Jan 1995	lecture and discussion

4.13.14 Sponsored Projects

Sl.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Co-ordinator(s)
1.	Physico-chemical studies of graphite intercalation compounds	92-95	CSIR	2.5	Dr. V.R.K. Murthy
2.	Location of hydrogen position in Laves Phase Compounds ErNi_2 by Neutron Diffraction	2 yrs	IUCDAEF	0.80	Dr. K.V.S. Rama Rao
3.	Effect of hydrogen on the magnetic properties of new materials with ThMn_{12} Structure	2 yrs	CSIR Dept. of Navy USA	4.00	Dr. K.V.S. Rama Rao Dr. K.V. Reddy Dr. Y.V.G.S. Murti
4.	Development of materials for hydrogen storage applications Phase I	3 yrs	DNES	5.94	Dr. K.V.S. Rama Rao Dr. Y.V.G.S. Murti
5.	Development of High energy density magnetic materials	3 yrs	MHRD & M/s. Asian Electronics Ltd. Bombay	54.70	Dr. K.V.S. Rama Rao Dr. K.V. Reddy
6.	Development of magnetostrictive materials	3 yrs	MHRD & M/s. Asian Electronics	160.00	Dr. K.V.S. Rama Rao Dr. K.V. Reddy
7.	Augmentation of laboratory facilities through NIOT	2 yrs	NIOT	70.00	Dr. K.V.S. Rama Rao
8.	Determination of magnetic structure of $(\text{Pr}, \text{Er})_2\text{Fe}_{17-x}\text{Al}_x\text{N}_y$ by neutron diffraction	1 yr	IUC	0.58	Dr. G. Markandeyulu Dr. K.V.S. Rama Rao
9.	Synthesis of new Materials & basic reserch in high- T_c superconductors	92-95	PMB (DST)	45.00	Dr. G. Rangarajan Dr. U.V.V. Raju & Dr. V. Sankaranarayanan
10.	Prodution of News letter on High T_c Superconductors	88-94	DST		Dr. G. Rangarajan

Sl.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Co-ordinator(s)
11.	Study of thermal & magnetic properties at ultra low temperature and in high magnetic fields	93-96	Indo German BMFT		Dr.G.Rangarajan Dr.E.Gmelin
12.	Optical Instrumentation	93-98	DAE National Laser Programme	50.00	Dr.R.S.Sirohi Dr.M.P.Kothiyal Dr.D.K.Sharma Dr.V.V.Rao
13.	Holographic memories and interconnects for optical computing	93-94	MHRD	12.00	Dr.R.S.Sirohi Dr.M.P.Kothiyal
14.	Investigations on Holo Optical elements	92-94	ARDM	13.48	Dr.R.S.Sirohi Dr.M.P.Kothiyal Dr.D.K.Sharma Dr.V.V.Rao Dr.(Mrs)V.Sirohi
15.	Molecular Dynamics in liquids liquid crystals and polymers		DST	3.5	Dr. J. Sobhanadri Nagarjuna andHyderabad Univs.Inter-Institutional project: IIT M
16.	Single interferogram evaluation and wave front fitting		ISRO-IIT M	4.50	Dr.D.K.Sharma Dr. V.V.Rao
17.	Interference & turbulence effects in Spray combustion	92- 96	ISRO IITM	7.40	Dr.R.Natarajan Dr.D.K.Sharma
18.	Training of Manpower and Development of Photonic Technology	91-94	MHRD	10.00	Dr.B.M.Sivaram Dr.J.P.Raina
19.	Establishment of a centre for Advanced Photonic Fibre Optic and laser Technology	91-94	MHRD	15.00	Dr.J.P.Raina Dr.B.M.Sivaram
20.	Studies of Transients using Microwave absorption and Laser Flash Photolysis	91-94	DST	24.00	Dr.J.Sobhanadri Dr.T.S.Natarajan
21.	Fourier Transform Spectroscopy	91-94	Indo-US	17.50	Dr.J.Sobhanadri Dr.V.R.K.Murthy
23.	Fabrication of a photoacoustic spectrometer	92-95	DST	9.00	Dr. C. Vijayan Dr. J. Subramanian (Pondicherry Univ.)
24.	A Modelling Utility for Defects by Rapid Analysis (MUDRA)	95-98	DST	5.00	Dr.Y.V.G.S.Murti Dr.C.Vijayan
25.	Modernization of B.Tech. Lab	-	MHRD	12.00	HOD Physics

4.13.15 Major Consultancy Assignments

Sl.No.	Title	Organisation	Amount (Rs. in Lakhs)	Co-ordinator(s)
1.	Stereo Microscope optics design	Appasamy Associates	0.24	Dr.D.K.Sharma

SI.No.	Title	Organisation	Amount (Rs. in Lakhs)	Co-ordinator(s)
2.	Fabrication and Testing of alignment optics	SAMEER	0.24	Dr.V.V.Rao
3.	RBIC project (Fabrication of Nd:Lasers)	Defence Lab. Jodhpur	14.00	Dr.T.A.Prasada Rao
4.	Development and study of Giant Magnetostrictive Rods for SONAR Applications	NPOL Kochi	24.35	Dr.K.V.S.Rama Rao
5.	Development and Supply of permanent Magnets containing Nd-Fe- B	S&S Power Switchgears Madras	2.25	Dr.K.V.S.Rama Rao Dr.K.V.Reddy

4.13.16 Honours and Award

SI.No.	Name of the Faculty/Students	Honours/Awards
1.	Dr.R.S.Sirohi	Fellowship SPIE
2.	Dr. V. Damodara Das	Marie Curie Fellowship by European Community Commission

4.13.17 Research Publications

1. V.Damodara Das and C.Bahuleyan - Variation of conduction Activation Energy and Resistivity with Thickness in $Pb_{0.5}Sn_{0.5}Te$ Thin Films Solid State Communications. 93. No.11, p.949-951, Jan. (1995)
2. P.R.Sreedhar, K.V.Sriram, P.Senthilkumaran, M.P.Kothiyal and R.S.Sirohi - Evaluation of phase conjugate beams using Talbot interferometry Opt. Commun. 106, 242-248 (1994)
3. P.Senthilkumaran, K.V.Sriram, M.P.Kothiyal and R.S.Sirohi - Array generation using double wedge plate interferometer J.Mod. Opt., 41, 481-489 (1994)
4. E.D.Dias, R.Pragasam, V.R.K.Murthy and B.Viswanathan - An Automated loop tracer for the study of growth of ferro electric crystal Rev.Sci.Instr.65, 3025, Sept. (1994)
5. R.Pragasam, V.R.K.Murthy and B.Viswanathan - Measurement of transition temperature (simultaneously) at dc and microwave frequencies on high T_c superconductors Physica Status Solidi (a)142, 465 (1994)
6. F.Beniére, M.Beniére, V.Hari Babu and K.V.Reddy - Self and Hetrodiffusion in crystalline solid solutions J.Phys.Chem.Solids 55 595-604 (1994)
7. Anjali Rastogi and K.V.Reddy - Self Diffusion in poly crystalline InSb films Semiconductor Science and Technology 9 2067- 2072 (1994)
8. Anjali Rastogi and K.V.Reddy - Self Diffusion in Indium Antimonide J.Appl.Physics 75 4984-4989 (1994)
9. V.Subramanian, V.R.K.Murthy and J.Sobhanadri - Microwave conductivity studies on some semiconductors Pramana 44 19-32 Jan. (1995)

10. S.S.N.Murthy and J.Sobhanadri - Study of some poly urethane elastomers using electrical methods J.Appl.Poly. Sci. 54 1499- 1506 (1994)
11. J.Sivaganthan, A.R.Ganesan, B.C.Tan, K.S.Low and R.S.Sirohi - Studies of steel weldments using electronic speckle pattern interferometry J.Testing and evaluation 22 42-44 (1994)
12. P.Senthilkumaran and R.S.Sirohi - Michelsyn interferometers in tandem for array generation Opt.Commun. 105 158-168 (1994)
13. P.Senthilkumaran, P.J.Masalkar and R.S.Sirohi - Fabrication of phase optical elements by ion exchange in glass J.Optics (India) 23 27-38 (1994)
14. N.Krishna Mohan, P.J.Masalkar, V.M.Murukeshan and R.S.Sirohi - Separation of influence of in-plane displacement component in multiaperture speckle shear interferometry Opt.Engg. 33 1973-82 (1994)
15. P.R.Sreedhar, N.Krishna Mohan and R.S.Sirohi - Real time speckle photography with two wave mixing in photo refractive BaTiO₃ crystal Opt.Engg.33 1989-95 (1994).
16. N.Krishna Mohan and R.S.Sirohi - Electronic Speckle Pattern Interferometry with conventional and holo optical elements J.Optics (India) 23 13-26 (1994)
17. R.S.Sirohi, Tomoaki Eiju, Kiyofumi Matsuda and Thomas H.Barnes - Reflection Multiple beam wedge plate shear interferometry for lens testing Optical Review 1, 293-95 (1994)
18. R.S.Sirohi, T.Eiju, K.Matsuda and P.Senthilkumaran - Multiple beam wedge plate shear interferometry in transmission J.Mod.Opt. 14, 1747-1755 (1994)
19. B.S.V.Gopalam - Quantum Theory of the Optical and Electronic Properties of Semiconductors Ind.J.Pure and Applied Physics, IJPAP 32, 200 (1994)
20. P.R.Ajith Kumar and V.Ramachandran - A Model for anelastic relaxation in high T_c Superconductors Physica C 3, 111-114 (1994)
21. K.Viswanathan and B.Subramanyam - Elastic anomalies in strontium titanate Pramana 42, 175-185 (1994)
22. B.Subramanyam -Second Order Elastic anomalies in barium titanate from Orthorhombic to rhombohedral phase transition Pramana 43, 181-187 (1994)
23. M.S.Sri Ram, C.Mukku, S.Lakshmi Bala and B.Bambah - Dynamical chaos in non-Abelian Chern-Simons-Higgs theories Phys. Rev.D.49 4246-4257 (1994)
24. Sundara Ramaprabhu, Nahid Amstutz, Edwin A.C.Lucken and Gerald Bernardinelli - N-Alkylimidazohdine-2-thione dihalogeno cuprate anions J.Chemical Research(S) 368-369 (1994).
25. Sundara Ramaprabhu, Nahid Amstutz and Edwin A.C.Lucken - ⁶³Cu and ⁷⁹Br NQR studies of halogenocuprate complexes of triphenyl phosphine Z. Naturforsch, 49a, 199-201 (1994).
26. Sundara Ramaprabhu Edwin A.C.Lucken and Gerald Bernardinelli Crystal structure and NQR of two copper(1) complexes of 4,6 dimethyl pyrimidine - 2 - thione Z.Naturforsch, 49A, 193-198 (1994).
27. Sundara Ramaprabhu, Rachel Ferritti, Edwin A.C.Lucken and Gerald Bernardinelli NQR studies on polyhalocuprate (I) anions Inorganica Chimica Acta, 227, 153-157 (1994).

28. Sundara Ramaprabhu, Edwin A.C.Lucken and Gerald Bernardinelli Copper 63 NQR frequencies and molecular geometries of three coordinate complexes of copper(1) halides with N-alkylimidazohidine thione and thinzohdiachthione ligand J.Chem.Soc., Dalton, 115-121 (1994).
29. C.Vijayan and R.Ravishankar Computer simulation of the magnetic phase transition Physics Education, 11 (2) 125-129 (1994)
30. K.R.Murali and Y.V.G.S.Murti Laser excited photoconductivity of color centers in NaCl Radiation Effects in solids 129 265-272 (1994)
31. C.V.Krishnamurthy and Y.V.G.S.Murti On the possibility of using color centers for third harmonic generation Nonlinear Optics 2 21-28 (1994)
32. B.Anusuya V.S.Murty and K.V.S.Rama Rao New rhenium centres in ammonium and potassium perrhenates J. Mol. Structures: 344 (1995) 135-142
33. B.Anusuya V.S.Murty and K.V.S.Rama Rao ESR studies of electron loss and gain centres in orthoperiodic acid (H₅IO₆) at 77 K J.Mol.Structures: 324 (1994) 269-276
34. R.Ramesh and K.V.S.Rama Rao Concentration and temperature dependence of electrical resistivity in Zr_{1-x}Ho_xCo₂(O_x1) Intermetallic compounds and their hydrides J. Appl.Phys. 76 (1994) 3556-3561
35. R.Ramesh, M.S.Ramachandra Rao and K.V.S.Rama Rao AC susceptibility studies on Zr_{1-x}Ho_xCo₂(O_x1) system and their hydrides J. Appl. Phys. 77 1995
36. Nithya Ravindran, T. Sarkar, G. Rangarajan and V. Sankaranarayanan Magnetic susceptibility and specific heat of Pr_{2-x}Ce_xCuO_{4-y} Journal of superconductivity 8 (1995)
37. N. Muthukumar, Narayani Senthilkumaran, K. Sethupathi, M.Sardar and G. Rangarajan interlayer tunneling and superconducting gap at finite Temperatures Physica C, 235-240 1907-1908 (1994)
38. Mridula Joshi, Prita Nair, B.M.Sivaram and J.P.Raina Ring Resonator Erbium Doped Fibre Lasers Tech. for Optical Fibre Comm. Ed.G.J.Brown, D.D.Decoster, J.S.La Course, Y.S.Park, K.D.Pedrotti and S.R.Sloan. SPIE Vol.2149, pg.28-35 (1994).
39. B.M.Sivaram, Mridula Joshi, Prita Nair and J.P.Raina In situ loss determination in erbium doped fibre lasers having different resonator configuration by studying relaxation oscillations Tech. for Optical Fibre Comm. Ed.G.J.Brown, D.D.Decoster, J.S.La Course, Y.S.Park, K.D.Pedrotto and S.R.Sloan. SPIE Vol.2149, pg.36-41 (1994).
40. Chitra Rangan, M.Venkata Satyanarayana and B.M.Sivaram Effect of Third Order Dispersion on the propagation of squeezed solutions in optical fibres. Physics and Simulation of Optoelectronic Devices II Ed.W.W.Chow and Marek Osinski, SPIE Vol.2146, pg.448-456 (1994).
41. B.M.Sivaram Rare Earth Doped Fibre Lasers and Amplifiers Emerging Optoelectronic Technologies, B.S.Sonde, R.Shenai and V.K.Tripathi, T.M.H.B. Co. pg.441-445 (1994).
42. Prita Nair, B.M.Sivaram and J.P.Raina Studies of dual wavelength pumping schemes for Co and Contra directionally pumped erbium doped fibre amplifiers Emerging Optoelectronic Technologies Ed.B.S.Sonde, K.Shenai and V.K.Tripathi TMHB Co. pg.157-160 (1994).
43. Chitra Rangan, M.Venkata Sathyanarayana and B.M.Sivaram The Propagation of squeezed solutions in Optical Fibres 3rd Order dispersion effects Perspective in Physics. Ed.K.S.Rao and L.Satpathy pg.234-241 (1994), Wiley Eastern Limited.

44. K.Rangaswamy, A.V.Narasimham and J.Sobhanadri Electrical dc conductivity of some aromatic polyamides Ind.Jl of Pune & Appl.Phys 32 489-493 (1994)
45. A.M.Niraimathi, E.Gmelin & G.Rangarajan Magnetic ordering of Nd³⁺ ions in the high temperature superconductor NdBa₂Cu_{3-x}Ga_xO_{7-y} (0 < x < 0.5 & 0.05 < y < 0.15) Phys. Rev. B. 51 03, (1995)
46. T.Rajasekharan, G.Rangarajan & N.Hari Babu Microstructural & Magnetisation study in melt-grown y-Ba-cu-0 samples Physica c 244 (1995), 106
47. T.R.Ravindran, V.Sanakaranarayanan and R.Srinivasan Ageing effects on thermal conductivity of YBa₂Cu₃O_{7-y} Physica C 235-240 (1994) 1379-1380
48. T.R.Ravindran, V.Sankaranarayanan and R.Sinivasan Thermal conductivity of YBa₂Cu_{3-x}Zn_xO_{7-y} ibid: 1381-1382

4.13.18 (b) Conference Presentations

1. V.Damodara Das and C.Bahuleyan Feasibility of Pb_{0.8}Sn_{0.2}Te Alloy Thin Films for Thermoelectric Applications National Conference on Thin Film Processing and Applications Sri Venkateswara University, Tirupati, Jan. 23-24, 1995
2. V.Damodara Das P.Sekhar and Laxmikant Damodare Photoelectrochemical studies on Vacuum Evaporated n-CuInSe₂ Thin Films National Conference on Thin Film Processing and Applications Sri Venkateswara University, Tirupati, Jan. 23-24, 1995
3. V.Damodara Das, K.Pavan Kumar and S.Selvaraj Thermal Oxidation of Antimony Thin Films National Conference on Thin Film Processing and Applications Sri Venkateswara University, Tirupati, Jan. 23-24, 1995
4. V.Damodara Das and Laxmikant Damodare Photoelectrochemical Studies on Vacuum Evaporated n-CdSe_{0.5}Te_{0.5} Thin Films Proc.National Conference on Developments in Electronic Materials and their Applications, Dept. of Physics, Shivaji Univ., Kolhapur, March 6-8, 1995, d-p31.p.57, (1995)
5. V.Damodara Das and P.Gopal Ganesan Automation for Thermoelectric Power and Electrical Resistivity Measurements on Thin Films Proc. National Conference on Developments in Electronic Materials and their applications. Dept. of Physics, Shivaji Univ., Kolhapur, March 6-8, 1995, d-p30.p.56 (1995)
6. Ganesha Udupa, K.Thirumalai Velu, R.S.Sirohi, M.P.Kothiyal and M.Singaperumal Precise form and surface error measurements of engineering and optical parts by confocal scanning optical microscope Proc. of the National Laser Symposium - 95, Feb. 10-14, 1995 at IRDE, Dehradun.
7. Ganesha Udupa, K.Thirumalai Velu, R.S.Sirohi, M.Singaperumal and M.P.Kothiyal Form error characterization by an Optical Method National convention on Precision and Micromechanisms, IPROMM - 1994, Feb. 24-25, 1995 at Bangalore
8. T.Santhanakrishnan, N.Krishna Mohan, P.Senthilkumaran, K.Palanisamy and R.S.Sirohi Multi-aperture Speckle Interferometry for Deformation Measurement, XXII OSI Symposium on Optical & Opto-Electronic Instrumentation, March 29-31, 1995, at CSIO, Chandigarh.
9. Shanti Bhattacharya, J.S.Darlin, P.Senthilkumaran, M.P.Kothiyal and R.S.Sirohi Study of Interferometric Array Generators with Different Levels of Phase Modulation, ibid.
10. R.Sreedhar, S.Anand, P.J.Masalkar and R.S.Sirohi Low Coupling Loss Reverse Ion-Exchanged Branching Devices in Glass, ibid.

11. P.R.Sreedhar, P.Senthilkumaran, N.Krishna Mohan and R.S.Sirohi Real-Time Image Plane Holography with BaTiO₃ Crystal, *ibid*.
12. V.Venkateswara Rao and L.K.Chanda A Non-Contact Diameter measuring Method using Holographic Scanner, *ibid*.
13. J.S.Darlin, M.P.Kothiyal and R.S.Sirohi Some Investigations in Talbot Interferometry for Collimation Testing, *ibid*.
14. J.S.Darlin, M.P.Kothiyal and R.S.Sirohi Collimation Testing using Self Referencing Cyclic Shearing Interferometer, *ibid*.
15. P.Senthilkumaran, K.V.Sriram, M.P.Kothiyal & R.S.Sirohi Improved collimation testing with multiple beam wedge plate lateral shear interferometer. International Conference 'INTERFEROMETRY' '94, Warsaw, Poland, May 16-20, 1994.
16. P.R.Sreedhar, N.Krishna Mohan and R.S.Sirohi Deformation studies with barium titanate as recording material, International Conference, 'INTERFEROMETRY' 94, Warsaw, Poland, May 16-20, 1994.
17. P.J.Masalkar, P.R.Sreedhar and R.S.Sirohi Low loss waveguide branching circuits by ion-exchange in glass, International Conference on Emerging Optoelectronic Technologies (CEOT'94) at Indian Institute of Science, Bangalore, July 18-22, 1994.
18. S.Krishnan, E.D.Dias and V.R.K.Murthy Microwave Dielectric Properties of ceramic(Ba₃MgNb_{2.2x}Ta_{2n})O₉ system 37th DAE symposium, Jaipur, Dec. 1994.
19. E.D.Dias and V.R.K.Murthy Influence of preparation condition on the dielectric properties of Ba(Mg_{1/3},Ta_{2/3})O₃ VIII National seminar on Ferroelectrics, Nagpur, Oct. 1994
20. F.Benier, V.Hari Babu, M.Beniére and K.V.Reddy Transport Phenomena in Alkali halide mixed crystals Seventh Europhysical Conference on Defects in Insulating crystals Lyon, France, July 4-9, 1994.
21. A.Praveen Kumar and K.V.Reddy Self Diffusion in Cu In Se₂ films Proc. Solid State Physics Symp. 37C 240 Dec. 1994.
22. B.S.V.Gopalam Zero dimensional semiconductors-Review paper Stark Effect on Quantum dot laser beam in the regime of confinement - paper NATIONAL LASER SYMPOSIUM-CAT:INDORE, Dehradun, Feb. 1995.
23. B.S.V.Gopalam Stark Effect on the light beam of a quantum wire laser in the regime of carrier confinement National Conference on Thin Films processing and applications, CAT, Indore, Jan. 1995.
24. B.S.V.Gopalam Effect of electric field on the light beam of a parabolic quantum well laser - Excitonic Effect Conference on the EMERGING OPTOELECTRONIC TECHNOLOGIES (CEOT-94), IISc. Bangalore, July 1994.
25. B.S.V.Gopalam Paper presented in the One Day National Seminar, Physics Dept., IIT, Madras, Sept. 1994.
26. Cornelia Palivan, T.Berclaz, Ramaprabhu Sundara, M.Gerffroy and G.Bernardinelli Formation of a CV(II) complex in X-irradiated [(N-methyl-ionduzolidine-2-thione)₂Cl]Cu(I): single crystal EPR Study Presented at ESR Symposium, Paris, France (1994).

27. D.K.Sharma, R. Nataraj and S. Stephen Design of 150mm Schlieren System for flow visualization studies XXII OSI symposium on Optical and Opto-Electronic Instrumentation, CSIO, Chandigarh March 29-31 1995
28. Radha D.Banahatti and Y.V.G.S.Murti Point defect modelling of transport processes in AgBr VII Europhysics conference on diffusion in insulating materials Lyon, France July 5-8 1994
29. P.Nithya, T.Sarkar, G. Rangarajan and V. Sankaranarayanan Crystalline electric field effects on the magnetic susceptibility of $Nd_{2-x}Ce_xCuO_{4-y}$ VI Annual General Meeting of MRS of India at IIT Kharagpur Feb. 1995
30. S.Uma, Babu Varghese, M.Seshasayee and G. Rangarajan Structural studies on $PrBa_2Cu_3O_{7-d}$ ($d = 0.11, 1.0$) VI National Seminar on Crystal Growth Feb 1995
31. B.Sanjai, Anasuya Raghunathan, T.S.Natarajan and G. Rangarajan DC electrical conductivity of heat treated polycobalt locyanine in the range 280-50K International Conference on Molecular Electronics and Biocomputing, ICMEBC Goa, Sept. 1994
32. B.Sanjai, Anasuya Raghunathan, T.S.Natarajan, G. Rangarajan and S.Venkatachalam Charge transport in polyaniline containing polyurethane DAE Solid State Symposium Jaipur, Dec.1994 Proc. 37-C 301 1994
33. B.Sanjai, Anasuya Raghunathan, T.S.Natarajan, G. Rangarajan and S.Venkatachalam DC electrical conduction in heat treated poly nickel phthalocyanine National Conference on Development in Electronic Materials and their applications, NCDEMA, Shivaji University, Kolhapur March 1995
34. Anasuya Raghunathan, G. Rangarajan and D.C.Trivedi Charge transport in polyaniline Indo-French workshop on electronic conducting polymers Karaikudi., March 1995
35. L.Vetrivel and B.M.Sivaram Design and Construction of high speed peak detector for use with pulsed lasers Proc. Nat. Laser Symposium, Indore pg.241-242, (1994).
36. L.Vetrivel and B.M.Sivaram Measurement of Pico Second pulse width using nonlinear Optics National Symposium on Optics, Madras Feb.10-12 (1994).
37. P.Nithya, T.Sarkar, G.Rangarajan and V.Sankaranarayanan Crystalline electric field effects on the magnetic susceptibility of $Nd_{2-x}Cl_xCuO_{4-y}$ ($x=0.14, 0.15$ and 0.16) presented at the VI Annual General Meeting of MRS of India, Held at IIT, Kharagpur during 8-10 Feb.(1995)
38. Narayani Senthilkumaran and G.Rangarajan Andreev reflection in BSCCO superconductor Proc. Solid State Physics Symposium, Atomic, Japan 37-C(1994),384.
39. S.Uma, T. Sarkar, G.Rangarajan and M.Seshasayee Magnetic Anisotropics of single crystals of $PrBa_2Cu_3O_{7-}$ ($= 0,1$) Proc. of the DAE Solid State Physics symposium, 37C, 384 Jaipur Dec. 27-31, (1994)

4.13.20 Any other Relevant Details

1. Dr. V. R. K. Murthy - editor of Section D - Bulletin of Pure and Applied Sciences ND
2. Dr. V. R. K. Murthy - National Committee member of LCA program, Ministry of Defence, ND

3. Dr.V.Ramachandran - Invited to contribute a chapter in vol.17 and 18 in book series "Studies of High Temperature Superconductors" edited by Anant Narlikar and published by Nova Science Publishers Inc., New York.
4. Dr.S.Lakshmi Bala - Elected as a speaker under the Theoretical Physics Seminar Circuit (TPSC) for the year 1994-95.
5. Dr.V.Balakrishnan - Member of DST Programme Advisory Committee on Condensed Matter Physics
6. Dr.B.M. Sivaram - Member of DST Programme Advisory Committee on Atomic and Molecular Physics
7. Dr. G. Rangarajan - took over as Head, department of Physics
8. Dr. K.V.S.Rama Rao - took over as Dean, IC & SR
9. The Department also has the following distinguished faculty:
 - i) Dr.D.Srinivasan - CSIR, Emeritus Scientist
 - ii) Dr.M.V.Satyanarayana - U.G.C. Research Scientist 'A'

The following Research Associates are working in the Department:

1. Dr.V.Vasu
2. Dr.Mary Sukeshini
3. Dr. Anasuya Raghunathan
4. Dr. K. Sethupathi
5. Dr. T. Sarkar
6. Mr. V. Subramanian

The following faculty and staff members retired from service -

1. Dr. C.K. Narayanaswamy
2. Dr.B.S.V.S.R.Acharyulu
3. Mr.A.P.Venugopal
4. Mr.S.Selvaraj
5. Mr.V.Narasimhan
6. Mr.U.I.George

4.14 Biotechnology Research Centre

4.14.1 Details of Faculty

Prof. Ch. Durgaprasada Rao [Head]
Prof. Megha Singh
Prof. T. Panda
Dr(Mrs.) T.S. Chandra
Dr.(Mrs.) K. Lalitha
Dr. S.K. Rakshit
Dr. T. Swaminathan

4.14.2 Research Programmes

1. Production of industrially important enzymes and biomolecules like penicillin amidase, B-1.3-glucanase, chitinase, pectinase, xylanases and cellulases, vitamin B₂.
2. Bacterial, fungal and yeast protoplast fusion and process development for direct conversion of agrowaste to ethanol (biofuel) by intergeneric hybrids of yeast and a fungus.
3. Bioleaching of sulfite ores.
4. Laser application in tissue characterisation and micro- rheological parameter estimation in health.
5. Management of phenolic waste and environmental biotechnology.

Development

1. Genetic Engineering (under Department of Chemical Engineering) and fermentation technology (under Department of Chemistry) facilities are developed.
2. First time indigenously developed electrophoration cum electrofusion system for rapid hybridization of organism and industrial strain development.

4.14.3 Sponsored Research/Consultancy Projects

Projects funded by ICAR and DBT and various industries.

4.14.4 Invitation

New York Academic of Science, USA has invited Dr.T.Panda to act as a member.

4.15 Regional Sophisticated Instrumentation Centre

4.15.1 Introduction

The Regional Sophisticated Instrumentation Centre was established in 1974-75. Now Ph.D. programmes are being offered. The major areas of teaching and research of the Departments are:

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

4.15.2 Details of Faculty

Name and Qualification

Major area of Specialisation

Professors

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

Theoretical Chemistry and Magnetic Resonance Spectroscopy, Bioinorganic

Surjit Singh, Ph.D.(IIT Kanpur)

Molecular Spectroscopy and General Physical Chemistry

S.Subramanian, Ph.D.(Leicester)

Magnetic Resonance Spectroscopy and Theoretical Chemistry

T.K.K.Srinivasan, Ph.D.(Banaras)

Molecular Spectroscopy

Visiting Faculty

Pradeep Thalappil, Ph.D.(IISc.)

Physical Chemistry, Molecular Spectroscopy, Electron Spectroscopy & Mass Spectroscopy

4.15.3 Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D.	-	-	2	3	-	3	-	6	-	-	12	2	14

4.15.4 Number of Scholarships/Fellowships holders

Programme	Institute	CSIR	Others	Total
Ph.D.	10	8	2	20

4.15.5 Number of Degrees Awarded

Programme	Number
Ph.D.	1

4.15.6 Instruments/Equipment Designed and Developed

FT-EPR Equipment being developed

4.15.7 New Facilities added and Major Equipment procured

New Digital Station with 5 GB memory

4.15.8 Short term course Organised

S.No.	Name of the course	Date
1.	Frontiers in Physical Chemistry	Dec. 19-29 1994

4.15.9 Invited talks during the Short term course:

Sl.No.	Name	Topic
1.	Dr.N. Chandrakumar Physical Sciences Divn. CLRI Adyar Madras	NMR instrumentation and imaging I & II
2.	Prof.J. Chandrasekar Organic Chemistry Lab. Indian Institute of Science Bangalore 560 012	Molecular Structure - I & II
3.	Prof.M.S. Hegde Solid State and Structural Chemistry Unit IISc. Bangalore	(1) Surface Chemistry (2) Thin Films
4.	Dr.T. Ramaswami Deputy Director CLRI Adyar Madras	(1)Role of some Metals in biology(2) Fast reaction techniques in in chemical kinetics

4.15.10 Organising Committee for the Short term course:

S.No.	Name of Faculty	Position
1.	Prof.P.T. Manoharan	Director
2.	Prof.Surjit Singh	Asso. Director
3.	Prof.S. Subramanian	Asso. Director
4.	Dr.Pradeep Thalappil	Asso. Director

4.15.11 Invited Lectures Delivered by the Faculty In Academic Institutions/Public Bodies

S.No.	Name of Faculty	Topic of Lecture	Delivered at	Date
1.	Dr.P.T. Manoharan	a. Modulation of Heme Environment in Reconstituted Hemoglobin	University of Michigan	June 1994
		b. New Results on Hemoglobin	NIH/NIA Baltimore	June 1994
		c. Modulation of Heme Environment in Reconstituted Hemoglobin	Osaka Univ. Osaka	June 1994

S.No.	Name of Faculty	Topic of Lecture	University	Date
	Dr.P.T. Manoharan	d. Exchange Interaction and Molecular Dynamics	Tokyo Metropolitan Univ. Tokyo	November 1994
		e. Au ^{II} -Au ^{II} Bond in Transition Metal Complexes	Kinki Univ. Higashi Osaka	November 1994
		f. Interesting Solid State and Solution Structures of a few Cu ^{II} /Cu ^I systems	Kanagawa Academy of Sciences and Technology Kawasaki	November 1994
		g. Raman Resonance Spectroscopy	CLRI Adyar Madras	April 1994
		h. Group Theory and Chemical Application	Sri Venkateswara Univ. Tirupathi	April 1994
		i. ESR Spectroscopy	Mahatma Gandhi Univ.Kottayam	March 1995
		j. Raman Spectroscopy	Mahatma Gandhi Univ.Kottayam	March 1995
		k. Modelling of Hemocyanin	Cochin Univ. Cochin	March 1995
		l. Reconstituted Hb - A Spectroscopic Approach	Madurai Kamaraj Univ. Madurai	March 1995
		m. Spin and Molecular Dynamics in Cu(II) and Cu(I) spins	Pondicherry Univ. Pondicherry	March 1995
2.	Dr.Surjit Singh	a. Anion molecular Interactions	IISc Bangalore	December 1994
		b. Raman Spectra and Structure of liquid water	Indian Oil Corpn. Faridabad	March 1995
		c. Molecular interactions and Raman Spectroscopy	Analytical Chemistry Association Delhi Chapter	Mar.1995.
		d. Interactions	Punjab Univ. Chandigarh	March 1995
3.	Dr.S.Subramanian	a. Magnatic Resonance Spectroscopy	Cochin University of Science and Technology Cochin	November 1994.
		b. Quantum Mechanics of Magnetic Resonance	Bharathidasan Univ.Trichy	February 10 1995.
		c. EPR Imaging	Sithalakshmi Ramaswamy College Trichy	March 25 1995.
		d. MRI and ERI - Magnetic Resonance Imaging	Pondicherry Univ. Pondicherry	Madras 29 1995.
4.	Dr.Pradeep Thalappil	a. Novel clusters and fullerenes	Farook College Calicut	January 1994
		b. Ion/Surface collisions	Indian Institute of Science Bangalore	August 1994
		c. Surface modification by low energy Ion/Surface Collisions (Poster)	ASMS Chicago	May 1994

4.15.12 Visits abroad

Sl.No.	Name of Faculty	Country visited	Date	Purpose of Visit
1.	Dr.P.T. Manoharan	USA	May-July 94	NIH/NIH Consultant for Hb Res.
		USA	Nov-Dec. 94	JSPS Fellowship by invitation
2.	Dr.S.Subramanian	USA	May-June 94	Visiting Scientist National Cancer Inst. NIH Bethesda Md.
		Japan	15-20 June 94	Yamagata Institute of Sci. & Technology.
		USA	15-25 Dec. 94	Radiation Biology Branch NIH Bethesda.
		USA	18 Dec. 94	Biophysics Dept. Medical Centre, Univ. of Milwaukee.
3.	Dr.Pradeep Thalappil	USA	May-July 94	Purdue Univ. W.Lafayettee

4.15.13 Distinguished visitors to the Department

Sl.No.	Name of the visitor & Occupation	Date of visit	Purpose of visit (Lecture/Discussion)
1.	Prof.Stanley Cameron, Professor of Chemistry Dalhousie University Halifax Nava Scotia, Canada	15-04-1994	Lecture
2.	Dr.Baldwon Robertson National Institute of Standards and Technology Gaithersburg, MD USA	03-08-1994	Lecture
3.	Dr.Ronald P. Mason Free Radical Metabolite Workgroup Leader Laboratory of Molecular Biophysic, NIH USA	08-08-1994 to 11-08-1994	Lecture and Discussion
4.	Dr.A.W. Parkar, Rutherford University United Kingdom	27- 08-1994	Discussion
5.	Prof.Harold M. Swartz, Department of Radiology Dartmouth Medical School Hanover, New Hampshire USA	06-01-1995	Lecture
6.	Prof.Dr.K.Weighardt, Lehrstuhl fur Anorganische Chemie, Fakultat fur Chemie Ruhr-Universitat Bochum Germany	17-02-1995	Lecture

4.15.14 Sponsored Projects

S.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Co-ordinator(s)
1.	Spectroscopic Investigations of inter and intra molecular interactions	1991-95	DST	18.00	Dr.P.T.Manoharan
2.	Construction of a FT-EPR Spectrometer	1992-1995	DST	84.00	Dr.P.T. Manoharan Dr.S. Subramanian
3.	Matrix ...Copperativity	-	DST	8.50	Dr.Surjit Singh
4.	M.O. Station Solvation	-	AvH Germany Donated work station	6.00	Dr.Surjit Singh
5.	Theoretical studies on... reactions	1992-1995	DST	6.20	Dr.S.Subramanian
6.	US-India Rupee project approved	1994-1997	-	20.00	Dr.P.T. Manoharan Dr.S. Subramanian

S.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Co-ordinator(s)
7.	Chemistry of Metallo-carbo-hedrenes	1995-1998	DST	7.05	Dr.P.T.Manoharan Dr.T.Pradeep
8.	Chemistry of functionalised and ...	1995-1998	-	3.47	Dr.T.Pradeep

4.15.15 Major Consultancy Assignments

Sl.No.	Firm's Name	Amount(Rs.)
1.	M/s. Shasun Chemicals and Drugs Ltd. Madras - 600 042	2,500
2.	M/s. Coronation Printing Ink Mfg. Co. Sivakasi	20,000

4.15.16 Research Publications

Dr. P. T. Manoharan

1. S. Venkatachalam, K. V. C. Rao, and P. T. Manoharan, ESR and magnetic properties of phthalocyanin polymers, *J. Poly. Sci. Polym. Phys. Ed. Part B: Polymer Physics*, 32, 37-52. (1994).
2. S. Sankarapandi, J. Rifkind and P. T. Manoharan, Thermodynamics of some long chain Biradicals studied by EPR spectroscopy, *Proc. Ind. Acad. Sci. (Chem. Sci.)*, 106, 1329, 1994 (12 pages).
3. Aggregation, Hydrogen Bonding and Thermodynamics Studies on BOC-Val-Val-Ile-OMe tripeptide Micelles in Chloroform, R. Jayakumar, R. G. Jeevan, A. B. Mandal and P. T. Manoharan, *J. Chem. Soc. Faraday Trans. 90(18)*, 2725 (1994).
4. R. Dharshan, N. K. Vaish, K. Shah, G. V. R. Chandramouli, B. Varghese, R. Muthukumar and P. T. Manoharan. The Cu(II) promoted Supramolecular self-assembly of Core oxalo retro-lispeptides: Crystal structure and magnetic property of [Aib-COCO-Aib]Cu₂, *J. Am. Chem. Soc.* 117, 1643-44 (1995).
5. P.K. Mandal and P. T. Manoharan, A comprehensive Study of Exchange Coupling in a Macrocyclic Binuclear Cu(II) Complex in Solid and Solution States, (*Inorg. Chem.* 34, 270-277 (1995).
6. J. Shiela Annie, S. Pfenninger and P. T. Manoharan, Electron Spin lattice Relaxation in some nickel dithiolence matrices with ⁶³Cu(II) complexes (*Proc. Acad. Sci. Chemical Sciences*).
7. T. Pradeep and P. T. Manoharan, Metallo-carbohedrenes: a new class of molecular clusters with cage structure, *Current Science*.

Dr. Surjit Singh

8. Effect of matrices, M.C. Shivagl and Surjit Singh *Proc. Ind. Natl. Sc. Acad. (A)* 60A, 457 (1994)
9. abinitio m.o.... oxides, P. Mohandas, Surjit Singh and J. Chandrasekhar, *Proc. Ind. Acad. (Chem Soc.)* 106, 339 (1994).
10. abinitio m.o. ... methyl chloride, A.F. Jayaraj and Surjit Singh *Proc. Ind. Acad. Sc. (Chem. Sci.)*, (1994).
11. abinitio m.o..... spectroscopic studies, A.F. Jayaram and Surjit Singh, *J. Mol. Struct.* 327, 107 (1994).

Dr. S. Subramanian

12. Valence charge fluctuations in Tl_{2-x-2z} Ba₂Ca_{2+x}Cu₃O_{10-y} system, C.S. Gopinath and S. Subramanian, *J. Solid State Chemistry*, 109, 211, (1994).
13. Exposure of Inp to hydrogen plasma in the presence of a "Sacrificial" Inp - An x-ray photoelectron spectroscopic study, S. Balasubramanian, C.S. Gopinath, S. Subramanian and N. Balasubramanian, *Semiconductor Science and Tech.* 9, 1604, (1994).
14. Comparative photoemission studies on (Bi, Pb) Sr₂Sr₂Ca_{n-1}Cu_nO_{2n+4} (n = 2 and 3), C.S. Gopinath, S. subramanian, M. Huth and H. Adrian, *J. Electron Spectroscopy and Related Phenomena* 70, 61, (1994).
15. Valence state of thallium in single-Tl-O-layered TlSr₂Ca_{n-1}Cu_nO_{2n+4} (n = 1 and 2): An XPS study, A. Sundaresan, C.S. Gopinatha, M. Sharon, S. Subramanian, L.C. Gupta and R. Vijayaraghavan, *Physical Review B* 50, 10238 (1994).
16. X-ray photoelectron spectroscopic studies of HgBa₂CuO_{4+δ}: Mixed valent mercury and copper, C.S. Gopinath and S. Subramanian, *Physica C*, 232, 222 (1994).
17. Special separation of two very closely related organic compounds by 1D TOCSY, T. Kanthimathi, Y.V.S.N. Moorthy, C.N. Pillai and S. Subramanian, *Magn. Reson. Chem.* 32, 452, (1994).

18. High speed digitizer/averager data acquisition system for Fourier transform EPR spectroscopy, T.J. Pohida, H.A. Fredrickson, R.G. Tschudin, J.F. Fessler, M.C. Krishna, J. Bourg, F. Harrington and S. Subramanian, Rev. Sci. Instr. 65, 2500, (1994).

Dr. T.K.K. Srinivasan

19. UPS and Molecular orbital calculations of cadmium Bromate dihydrate, T.K.K. Srinivasan, T. Devanathan and Viswanathan, Ind. J. Chemistry, 33A, 889 (1994).
20. Mechanically activated MoO₃. III. Characterization by vibrational spectroscopy, G. Mestl, T.K.K. Srinivasan and H. Knoezinger, Langmuir.

Dr. Pradeep Thalappil

21. Low energy interactions of Group IIIB, VB, VIB and VIIB ions with fluoroalkyl SAM surfaces: Reactions, unusual sputtering effects and mechanistic implications, T. Pradeep, T. Ast, R.G. Cooks, and B. Feng, J. Phys. Chem., 98 (1994) 9301-9311.
22. Fullerene inflation in ion/surface collisions, T. Pradeep and R. G. Cooks, Int. J. Mass Spectry. and Ion Process, 135 (1994) 243-247.
23. Ion/Surface reactions with metal ions at fluorinated SAM surfaces: Formation of MF_n⁺ ions (M = Ti), Cr, Fe, Mo and W, n = 1.5), T. Pradeep, D. E. Riederer, S. H. Hoke, T. Ast. R.G. Cooks and M. R. Linford, J. Am. Chem. Soc. 116 (1994) 8658-8665.
24. Converted hydrogen rearrangement in C₁₀H₁₀Ni⁺, T. Pradeep, J.S. Patrick, B. Feng, S.A. Miller, T. Ast and R.G. Cooks, J. Phys. Chem. (1995).
25. Chemical modification of a fluorinated self-assembled monolayer by reactive ion beam bombardment, T. Pradeep, B. Feng, S. Pachuta, J.S. Patrick, T. Ast and R.G. Cooks, J. Am. Soc. Mass Spectrometry (1995).
26. Reactions of ions with organic surfaces, R. G. Cooks, T. Ast, T. Pradeep and V. H. Wysocki, Acc. Chem. Res. 27 (1994) 316- 323.
27. Metallocarbohedrenes: new class of molecular clusters with cage structure, T. Pradeep and P.T. Manoharan, Current Science.
28. Preferential order at the surface of a liquid perfluoro- polyether revealed by X-ray photoelectron spectroscopy, S. Ramasamy and T. Pradeep, J.Chem.Phys.

4.15.17 Any other Relevant Details

1. Prof.P.T. Manoharan

- a. Chairman, UGC panel in Chemistry
- b. Member, PAC/DST (Inorganic Chemistry)
- c. Member, RAC, I.A.C.S., Calcutta
- d. Member, INSA-COSTED National Committee
- e. Member, RAC and Executive Council, IUC, Indore
- f. Vice President, National Magnetic Resonance Society

2. Prof.Surjit Singh

- a. Member, Editorial Board, Indian Journal of Chemistry

3.Prof. S. Subramanian

- a. Member, PAC/DST (Physical Chemistry)

During 1994-95, RSIC received a sum of Rs.73 lakhs plan and non-plan fund. Two new research schemes have been brought.

4.16 Computer Centre

4.16.1. Introduction

The Computer Centre was established in 1973 and provides Central Computing resources - facility and support. The Centre started with IBM 370 and changed over to SIEMENS 7580-E in 1987. The mainframe is complemented with MX500 running Unix and several micro computers and PCs to support research and development in various areas. Applications for the institute are also supported.

The existing computing facilities were found to be inadequate and by present international standards obsolete. The committee constituted by the Senate shortlisted and recommended configuration. Based on site visits to various organisations/ installations, new systems have been identified and procured. These are listed under "New facilities/equipments added".

It is also planned to use existing cables to various departments for institute-wide extended ethernet network to start with. As a first step, internet connectivity has been established to Aerospace Engineering Department using CISCO routers and modems.

4.16.2. Details of Staff

Name & Qualification	Major Area of Specialisation
Head Prof.Muthukrishnan C R, Ph.D	Software Engg, Distributed and Parallel Systems, Object Oriented Systems.
Manager Mr Sehasayi P, M.S. (on leave)	Semantics, Computer Systems Natural Language Processing
Senior Systems Engineer Mr Dheenadayalu R, M.Sc(Engg) Senior System Programmer (SG) Dr Ramanujam M K, Ph.D	Data Centre Operations, System Administration. Systems Programming, Operating Systems, Computer Networks.
System Engineers Mr Jayaprakash S, M.S Mr Ramesh S K, M.S	Programming Methodology, Computer Networks, Fault tolerant Distributed Systems. MIS, Data Management, Data Processing, Syst Programming.
Assistant System Engineers Mr Baman Banavath B.Tech(C.S) Ms Vatsala, M.S	System Analysis & Design, Database Management Systems, DOS Utilities. System Analysis & Design, Application Software Development, Systems Programming, Database Management.
Assistant Systems Officers Mr Santhosh Arvind, M.Sc(Phy) M.Sc(O.R & C.A)	Operations Research, System Analysis & Design, MIS, DBMS

Name & Qualification**Major Area of Specialisation**

Mr Sourirajan C S, M.Sc.

System Administration, Programming Languages, Small Computers, Application Software Development.

Dr (Mrs) Vijayalakshmi Sirohi, Ph.D

Software Engineering, Database Management Systems, Numerical Computing, Application Software, Parallel Computing, System Analysis & Design, Systems Programming.

Junior System Engineer

Mr Sreekumar P Y, B.Tech(C.S)

Database Management Systems, Systems Programming, Application Programming.

Junior System Officers

Mr Ramalingam S, M.Sc (Comp.Applins)

System Analysis and Design, Database Management systems, Software Development (Unix).

Mr Ravichandran V, M.Sc.

Application Programming, Database Management systems, System Operations, Networking working, Systems Programming

Mr Vijayaraghavan C N, M.Sc. & P.G in Ind. Maths

Computer Applications in Industry, Operating Systems, Systems Operation/Administration, Networking.

4.16.3. System Trainees on Roll

S.No.	Year	Number
1.	1993-95	12

4.16.4. New Facilities/Equipments Added**Additions
Hardwares**

The modernisation proposal features 3 models of IBM RISC System/6000. The systems support a common Operating System, AIX (Advanced Interactive Executive).

The Central File and Database server is a high-end system, IBM RS6000 model 590 based on the latest POWER2 architecture.

Four numbers IBM RS6000 model 370 based on POWER architecture will function as dedicated Compute servers (Headless servers) to process batch jobs.

Two Workstations IBM RS6000 model 25T based on POWERPC architecture offering powerful Graphics is provided.

Forty eight numbers of IBM 3151 Terminals serve as Clients.

Networking LAN topology is star type with ACCESS/ONE UNGERMANN BASS product as hub of cabling layout.

Every RISC SYSTEM/6000 has the System Management Tool (SMIT) as part of OS AIX. Network Management station runs a Network Monitoring Software NetDirector.

Softwares

The Softwares include:

Optimised Language Compilers ANSI C, C Set++, FORTRAN, Pascal, MF COBOL, Engg & Scientific Subroutine Library, IBM Load Leveller, Plot Library, AIX WINDOWS 2D/3D, Xstation Manager (Server component) TCP/IP, NFS

Applications Development Laboratory

The laboratory is used as support for the professional work in Computer Centre and as platform for development and transfer for Institute and other applications.

Additions

Hardwares

ACER Hard disk upgraded to 1.75 GB
WIPRO GENIUS 486
WIPRO GENIUS 386
WIPRO GENIUS 386 BRIDGE
PRINTER
HP LASER JET PRINTER
BARCODE READER
LCD PC PROJECTOR

Softwares

MICROSOFT WINDOWS with SDK
WORDPERFECT
SCO UNIX TCP/IP

Networking

Ten numbers CISCO 2501 Routers each with 2 Serial and 1 AUI ports have been procured for establishing Internet connectivity to Departments, using the existing serial cables. Aerospace Engineering department has been connected up recently.

PC Maintenance Cell

The PC Maintenance Cell set up a test and repair facility consisting of a Mother Board tester, temperature controlled soldering and desoldering station. The Cell also upgraded a number of Personal Computers in the Computer Centre and other departments. It also organised a free check up of Laser printers by Ms. Reddington India in all the departments, centres and units.

Three half-day course on "Fundamentals, Use and Care of Personal Computers" for staff and students of the Institute were conducted.

4.16.5. Short Term Course/Workshops Attended by the Staff

S.No.	Name of staff	Course/Workshop attended	Period
1.	Mr S Jayaprakash Mr.CN Vijayaraghavan	Multi-media Periphery Routing MOTOROLA	6th April 1994.
2.	Mr S K Ramesh Mr S Jayaprakash	Enterprisewide Networking COMNET/HCL-HP	18th April 1994

S.No.	Name of staff	Course/Workshop attended	Period
3.	Mr S K Ramesh Mr S Jayaprakash Mr V Ravichandran Dr (Mrs) Sirohi	Massively Parrellel Computing TISL	22nd April 1994.
4.	Ms Vatsala Mr C N Vijayaraghavan Mr C S Sourirajan	Structured Networking Microland	5th May 1994.
5.	Mr S K Ramesh	Workflow Computing SOWSWE Madras	2nd June 1994.
6.	Mr V Ravichandran Mr C N Vijayaraghavan	Distributed C/S solutions TISL Madras	22nd Sep 1994.
7.	Mr S Jayaprakash Mr S K Ramesh	Creating Manageable Network MICROLAND	25th Oct,94.
8.	Dr (Mrs) Sirohi Ms Vatsala Mr V Ravichandran Mr C N Vijayaraghavan	CA-UNICENTER for UNIX L&T Madras	10th Nov 94.
9.	Mr S K Ramesh Mr S Jayaprakash Mr R Dheenadayalu	RS6000- 40P System Launching TISL Madras	16th Nov 94.
10.	Mr C N Vijayaraghavan	OPEN MVS/EISA TISL Madras	20th Dec 94.
11.	Prof C R Muthukrishnan Dr M K Ramanujam	CA-UNICENTER for UNIX L&T Mc Neil Madras	2nd Feb,95
12.	Mr V Selvaraju(PC Cell)	Hardware Training Course at Computer Garage Institute of Hardware Training, Bangalore & TARC CGPL Bangalore	5 months from Feb. 94.

4.16.6. Staff Served in Committees

Prof. C R Muthukrishnan

Mr R Dheenadayalu

Dr M K Ramanujam

Mr R Dheenadayalu

Mr R Dheenadayalu

Chairman

Member

Member

→ Senate Committee on modernisation
of Central Computing Facilities

Member, Committee for revising the syllabus of
Computer Science for Stds XI & XII of TN State
Board of Higher Education.

Reviewer for the Text Books for Std XI being
prepared by TN Text Book Society.

4.16.7. Visitors/Invited Talks

S.No.	Name & Occupation	Purpose
1.	High Level Delegation from Complete Business Solutions(I) Ltd.	Visit to Computer Centre
2.	Prof.Rudiger Schultz Siemens, Munich	Public Communication Net Works
3.	Prof.Kasi Anantha Dept of Comp.Science San Diego State University San Diego USA	Kumaran Multi processor Operating Systems
4.	Mr.Kannan Varadan University of Southern California	Routing-new trends.

S.No.	Name & Occupation	Purpose
5.	Dr.James Clark Director, Information & Communication Institute of Singapore	Activities of ICIS

4.16.8. Technical Presentations

Sl.No	Date	Company	Products
1.	25.05.94	HCL/HP	Product Demonstration of HP 9000 model 712/60
2.	03.08.94	L&T Madras	Application Express - Appln. Dev. based on Relational Techqe
3.	22.09.94	CADGRAF	OCR Scanner
4.	04.01.95	Raghuram Associates	MATLAB Demo Kit
5.	05.01.95	INFOCORP	Pocket Hard disk
6.	10.01.95	R.K.Pillai, USA	Information Engg. Facility-CASE tool
7.	08.03.95	Indus Software Madras	SYNTHESIS CASE tool
8.	28.03.95	Cyber Systems	Epson Stylus Color Inkjet Printer

4.16.9. Institute Projects

S.No.	Title	Coordinator
1.	Hospital Information System	Mr.Dheenadayalu R.
2.	JEE Data Processing.	Mr Sourirajan C.S. Mr.Santhosh Arvind
3.	GATE Data Processing	Mr. Ramesh S.K.
4.	M.Tech Admission	Mr. Ramesh S.K. Mr. Ravichandran V
5.	CARS System Management	Mr.Ramesh S.K.
6.	Stores & Purchase Management	Dr. (Mrs) Sirohi
7.	CLAM Management-Library	Mr. Jayaprakash S. Mr.Ramalingam S.
8.	Hostel Billing System	Mr. Sourirajan C.S. Mr. Ravichandran V. Mr. Santhosh Arvind

4.16.10. Sponsored Projects

S.No.	Co-ordinator	Funding Agency	Title
1.	Prof C R Muthukrishnan	NIOT	Networking all academic departments NIOT to Computer Centre
2.	Mr S K Ramesh	AICTE	GIS Laboratory for Engineering Applications - under Thrust Area in Technical Education.
3.	Dr (Mrs) Sirohi	ARDB	Investigations on Holo-optical elements
4.	Dr M K Ramanujam	AICTE	Applications of Computer Graphics- under Modernisation

4.16.11. Consultancy Projects

S.No.	Co-ordinator	Title	Organisation
1.	Mr Jayaprakash S.	Advice on setting up CAD Facilities & preparation of Course curriculum	Marg Gregarian College of Engg. Madras

4.16.12. Lectures Delivered

S.No.	Faculty	Title	Venue
1.	R Dheenadayalu	Relevance of Computer education during convocation of LIBA	Loyala College Madras.
2.	S Jayaprakash	Internetworking	CGIHT Madras.
3.	S Jayaprakash	Network Layers & Introduction	Standards CMC Madras.
4.	S K Ramesh	Data Communication	CGIHT Madras.
5.	Ramanujam M K	Client/Server Networking Technology Appreciation Programme	M/s TATA-ELXSI Madras

4.17 Materials Science Research Centre

4.17.1 Introduction

The Department of MSRC established in 1975. The major areas of teaching and research of the Department are:

- (1) Ternary Superconductors (Low T_c and High T_c : Synthesis, characterization and study of T_c , H_{c2} and other parameters - Efforts to correlate T_c with known structure-related properties - studies on improvement of T_c of copper oxides and search for non- copper oxide high T_c superconductors.
- (2) Layered Transition Metal Dichalcogenides and Intercalation compounds. Synthesis, crystal growth and characterization and measurement of physical properties including T_c ; Study of electrochemical properties including intercalation and application as battery cathode materials.
- (3) Perovskite Mixed Oxides

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

- (4) Pyrochlore Mixed Oxides

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

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

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

- (6) Fast Ion Conductors

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

- (7) Nuclear Waste Disposal Materials

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

4.17.2. Details of Faculty

K.V.S.Rama Rao, Ph.D.(Andhra)[Head]

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

FRSC (Lond).C.Chem.

FAIC (USA) F.I.A.Sc. (Ind.) FNA (Ind.)

Director, CECRI, Karaikudi (on lien)

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

Magnetism and Magnetic Materials

Materials Science and Solid State Chemistry .. High T_c ternary superconductors... Solar Energy

Conversion and storage using PEC cells ... R&D of new materials for nuclear waste disposal... Fast ion conductors based on Nasicon and others

High T_c superconducting materials; High temperature oxide and phosphate based ceramics; magnetic materials.

4.17.3. Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D.	2	1	-	-	-	1	1	2	2	-	5	4	9

4.17.4. Number of Scholarships/Fellowships holders

Programme	Institute	CSIR	Others	Total
Ph.D.	5	--	4	9

4.17.5. New Facilities added and major equipment procured

1. HP Oscilloscope, four channel, Model No.54601A, 100 MHz Band width.
2. Keithley's Electrometer Model No. 617 and Digital Voltmeter Model No. 182, 10 nV resolution

4.17.6. Invited Lectures delivered by the Faculty in Academic Institutions/Public Bodies : 5

4.17.7. Distinguished visitors to the Department

S.No.	Visitor's Name & address	Date	Purpose
01.	Dr.U.R.K.Rao Head BARC Bombay	27 Jun. 94	Lecture & Discussion
02.	Prof.S.Sekhen Gurunanak University Punjab	29 June 94	- do -
03.	Dr.Ashok Dhingra Dupont Central Res. & Development USA	16 Aug. 94	-do-
04.	Dr.Malli Rao Dupont Central Res. & Development USA	16 Aug. 94	-do-
05.	Dr.T.Rajasekaran DMRL Hyderabad	1st Sept. 94	-do-
06.	Dr.R.K.Bhatnagar IFCPAR New Delhi	14-16 Sep. 94	-do-
07.	Prof.S.V.Suryanarayanan Head of the Department Osmania Univ. Hyderabad	2-3 Oct. 94	-do-
08.	Prof.B.V.R.Chowdhry University of Singapore, Singapore	25- 26 Nov. 94	-do -
09.	Prof.Akira Fujishima Univ. of Tokyo Japan	20-21 & 27th Nov. 94	-do-
10.	Prof.F.J.Berry Dept. of Chemistry The Open University Milton Keynes England	03 Feb. 95	-do-
11.	Prof.A.Srinivasa Rao Naval Surface Warfare Centre Annapolis Maryland	20 Feb. 95	-do-
12.	Prof.T.Venkatesan Department of Physics University of Maryland USA	15 Mar. 95	-do-
13.	Dr.N.S.Gajbhiye Associate Professor Dept. of Chemistry IIT Kanpur	3 Apr. 95	-do-

4.17.8. Sponsored Projects

Indo-French Project: "Redox Mechanisms in High T_c Superconductors and search for new Copper and Non-Copper based Superconductors"

4.17.9. Research Publications

1. V.Badri and U.V.Varadaraju, "Effect of La^{3+} substitution on the structure and superconductivity in $TiBa_2La_xCaCu_2O_7$ ($x=0.0-1.0$)". Solid State Commn.93 (12) 1995 1003-1007.
2. G.V. Rama Rao, D.S. Suryanarayana, U.V. Varadaraju, G.V.N. Rao and S. Venkadesan, "Synthesis of $YBa_2Cu_3O_7$ by different gel routes", J. Alloys and Compounds 217 1995, 200-208.
3. G.V. Rama Rao, D.S. Suryanarayana, U.V. Varadaraju, S. Geetha Kumari and S. Venkadesan, "Effect of pH on the synthesis of $YBa_2Cu_3O_7$ compounds by sol-gel process", Matter.Chem.Phys. 39, 1994, 761-762.
4. P. Sumana Prabhu, M.S. Ramachandra Rao and U.V. Varadaraju, "Effect of 3d metal ion (Fe,Ni,Zn), substitution in $REBa_2(Cu_{3-x}M_x)O_7$ (RE=Sm,Dy)", Physica C 235-240, 1994, 887-888.
5. P. Sumana Prabhu, M.S. Ramachandra Rao and U.V. Varadaraju, " T_c suppression and conduction mechanisms in $Bi_{2.1}Sr_{1.93}Ca_{0.97-x}R_x-Cu_2O_{8+y}$ ", Phys. Rev.B, 50, 1994, 6929.
6. T.A. Mary and U.V. Varadaraju, "Orthorhombic - tetragonal and semiconductor - metal transitions in the $La_{1-x}Sr_xRhO_3$ system", J.Solid State Chem., 110, 1994, 176-179.
7. V. Ponnambalam and U.V. Varadaraju, "High-temperature resistivity and thermopower studies on substituted Bi-2212 and Bi-2201 systems", Physica C, 227, 1994, 102-108.
8. K.V. Govindan Kutty, R. Asuvatharaman, C.K. Mathews and U.V. Varadaraju, "Effect of variation in framework composition on the thermal expansivity of NZP phases", Mater.Res.Bull. 29(10), 1994, 1009-1016.
9. M.Sugantha, U.V. Varadaraju and G.V. Subba Rao, "Synthesis and characterisation of NZP Phases, $AM^{3+}M^{4+}P_3O_{12}$ ", J.Solid State Chem., 111 1994, 33-40.
10. P.A. Ramakrishnan, U.V. Varadaraju and G.V. Subba Rao, "Photoelectrochemical studies on the mixed oxides, $A_6Nb_8Ti_2O_{30}$ (A=Ba,Sr)", Bull.Mater.Sci. 17, 1994, 959-965.
11. K.V. Govindan Kutty, S. Rajagopalan, C.K. Mathews and U.V. Varadaraju, "Thermal Expansion behaviour of the oxide pyrochlores $Ln_2M_2O_7$ (Ln=La-Gd; M=Zr,Hf)", Mater. Res.Bull. 29(7), 1994, 759- 766.

4.18 Fibre Reinforced Plastics Research Centre

4.18.1 Introduction

Fibre Reinforced Plastics (FRP) Research Centre was established in 1974 with a view to take up inter-disciplinary research and manpower training in the area of composites technology. The Centre offers elective courses at MS and Ph.D programme for students registered through various departments. The major areas of teaching and research of the centre are:

- * Development of Composite Materials
- * Manufacturing technology of polymers, metal and ceramic matrix composites
- * Theory of composite materials
- * Analysis of composite structures
- * Composites product design
- * Testing and quality control

4.18.2 Details of Faculty

Name and Qualification	Major area of specialisation
Chief Design Engineer N.G.Nair, Ph.D(IIT Kanpur)	Composites Technology including materials and process development, Analysis and design of composite products, Quality assurance of composites structural engineering
S.K.Malhotra, Ph.D(IIT Madras)	Design and development of composite products processing and testing of composite materials and products

4.18.3 Students on Roll

Programme	I Year		II Year		III Year		IV Year		V Year		Total		Total
	M	W	M	W	M	W	M	W	M	W	M	W	
Ph.D.	2	-	1	-	2	-	2	-	1	-	8	-	8
M.S.	2	-	1	-	1	-	1	-	-	-	5	-	5
Total	4	-	2	-	3	-	3	-	1	-	13	-	13

All registered through departments

4.18.4 Number of Scholarship/Fellowship Holders

Programme	Institute	Others	Total
Ph.D	7	1	8
M.S.	4	1	5
Total	11	2	13

4.18.5 Visits Abroad

SI.No.	Name of Faculty	Country visited	Date	Purpose of visit
1.	Dr.N.G.Nair	Japan	13-18 Mar. 1995	As a member of the Indian delegation of India-Japan collaboration on Composites Technology

4.18.6 Sponsored Projects

The following projects sanctioned in earlier years and were continued during the year.

SI.No.	Title	Period	Funding Agency	Amount (in Lakhs)	Coordinator
1.	Development of Orthotic Knee and Hip joints with composite for energy... Paraplegics	3 years	DST	6.07	Dr.N.G.Nair
2.	Design and Technical support for the development of FRP blade for wind turbines	-	-	0.55	Dr.N.G.Nair
3.	Design and quality supervision of FRP dome	-	Sri Jayendra Mahameru Kanchi Kamakodi Peedam	0.65	Dr.N.G.Nair
4.	Conversion of PET wastes into unstaturated polyester resin	-	-	0.29	Dr.N.G.Nair

4.18.7 Major Consultancy Assignments

S.No.	Title	Amount (Rs.in lakhs)
1.	Miscellaneous Design Projects	0.93
2.	Technical help for the repair of FRP Mine sweeper	0.35
3.	Testing consultancy under composites Test Facilities	1.83

4.18.8 Research Publications

1. N.G.Nair, India-Japan Seminar proceedings on Manufacturing Science of Advance Composite, March 1995.
2. K.Sudharsanam, Dr.N.G. Nair, Studies on crosslinked transparent acrylic panels, Polymer Plastic Technology Engg., Vol.34, No.3, pp.439-446, 1995.
3. S.K.Malhotra, R.Krishnamurthy and N.Ramasubramanian, Mechanical and Tribological characteristics of filled ultra high molecular weight high density polyethylene, Proc. of Int. Symposium on Macromolecules, Jan 11-13, 1995, VSSC, Trivandrum.
4. M.Subramanian, S.K.Malhotra and R.Krishnamurthy, Effect of curing agents on the toughness of epoxy matrices and its composites, Proc. of Int. Symposium on Macromolecules, Jan. 11-13, 1995, VSSC, Trivandrum.

4.19 Centre for Industrial Consultancy & Sponsored Research

4.19.1 Introduction

The Centre for Industrial Consultancy and Sponsored Research is responsible for providing support for the management of consultancy and sponsored research projects sanctioned to the Institute and also for promoting industrial and liaison activities of the Institute. These are:

- * Sponsored Research Programmes
- * Plan Schemes
- * Technology Development Mission Schemes
- * Consultancy programmes
- * Collaborative research with foreign countries
- * Industrial associateship scheme
- * ISRO-IITM Cell joint projects sponsored by ISRO
- * CODAPS Cell joint projects sponsored by National Institute of Ocean Technology
- * Entrepreneurship Development Programmes
- * Technology transfers
- * Patents, etc.

4.19.2 Sponsored Research

65 Projects of value totalling to Rs 925 lakhs were handled during 1994-95.

4.19.3 Plan Schemes

The Centre provides administrative support for plan schemes of Ministry of Human Resources Development sanctioned to the Institute in the emerging areas and processing of technology such as CAD-CAM, VLSI, Telematics, Fibre Optic Communication, Environmental engg, etc. The following schemes were sanctioned during the year.

1. Devpt of Advanced Level Instruction & Research Support facilities for Transport System & Plan Management
2. Devpt of GaAs Based Mesfet & Hemt Logic Circuits
3. Evaluation of Tribological Characteristics of Plasma Trade Ceramic Coatings

4.19.4 Consultancy Programmes

The total value of consultancy assignments was Rs.263 lakhs in 1994-95. Research Based Industrial Consultancy activity contributes nearly 40% of the total value of the assignments. Also 17 faculty were retained as consultants of various industries. Another important activity is the interdisciplinary programmes for providing consultancy to Tamil Nadu Pollution Control Board, Tamilnadu Leather Development Corporation and Tamilnadu Minerals Limited. The Graphite beneficiation plant set up at Sivaganga by TAMIN was commissioned during the year.

4.19.5 Collaborative Research projects

Eight joint research projects taken up through BMFT, Germany apart from the six earlier ongoing support for development of the facilities in Catalysis, Material Sciences, Electronics, Production Engineering, Metallurgy and Ocean Engineering Centre have continued. Also projects under Indo-US and Indo-EEC, Indo-French, etc. have continued.

4.19.6 Industrial Associateship Scheme

The response from the industry towards this scheme has been highly encouraging. More than 300 industries are members of this Scheme. Six Technology Appreciation Programmes were organised and some of the facilities of the departments/ centres were thrown open for the associates through "Presentation of the facilities".

Abstracts of M.Tech, M.S. and Ph.D. Programmes were published for the benefit of the Associates.

4.19.7 ISRO-IITM Cell Joint Projects

This is an ongoing research activity sponsored by the Indian Space research Organisation where research projects of interest to ISRO are being taken. 9 new projects were taken up during the year. Review of the projects were carried out.

4.19.8 Technology Development Missions

Mission mode projects in the areas of New Materials, Energy Efficient Technologies and Natural Hazards Mitigation, with financial support from the Planning Commission were taken up during the year. A few industries have already agreed and extended the financial support for some of these projects.

4.20 Central Electronics Centre

4.20.1 New Course Started

- * Eleventh Training Programme of One Year duration was started on 02-01-1995. Fifteen Candidates are selected.
- * Six weeks Training Programme for staff of Malaysian University under International consultancy.

4.20.2 New facilities added and major equipment procured

- | | | |
|----|--|----------------|
| a) | Plus Direct Projector | Rs.1,08,230-00 |
| b) | Fibre Glass Light Tight cover for photo Plotter Model 4PGZ | Rs. 10,868-00 |

4.20.3 Major Consultancy Assignments

S.No.	Title of Assignment	Organisation	Amount	Co-ordinator
1.	CPU modules for Siemens PLC	TAMIN	56,200	M.Kumaravel
2.	LABOD DC DRIVES	TAMIN	46,000	-do-
3.	VISI Test System	SPIC	32,000	-do-
4.	Telemecanique PLC	SPIC	30,000	-do-
5.	Dynamic Strain Indicator	LUCAS TVS	19,000	-do-
6.	Output modules for SIEMENS PLC	TAMIN	66,000	-do-
7.	OKI Data Printer	HAPP	5,500	-do-
8.	Display modules for Siemens PLC	TAMIN	6,500	-do-
9.	Holiday Detectors	MIL	5,500	-do-
10.	Power supplies	TAMIN	46,000	-do-
11.	CRU Modules for CNC	HAPP	27,000	-do-
12.	Stepper Motor CONTROLLER	ELECT.DYN.	12,000	-do-
13.	Photocopying Lathe	WS. Ind.	17,000	-do-
14.	Controller for Fusing Machine	ELECTRO DYNE	4,000	-do-
15.	Lenz Speed contr.	TAMIN	24,000	-do-
16.	Siemens Console	TAMIN	9,500	-do-
17.	Fabrication of Seq. Controller for Welding	ELECTRO.DYNA.	16,000	-do-
18.	Digital Ammeters	TAMIN	7,500	-do-
19.	PLC Timing modules	TAMIN	50,000	-do-
20.	GammaCounter	SANTHOSH	7,500	C.Kuppuswamy
21.	Drilling Dyn. Meter	ANNAMALAI UNIV.,	2,000	Srinivasan
22.	Strain Meter	PWD, MADRAS	10,000	-do-

4.20.4 Any other relevant details

The Centre has 12 Technicians, 3 Administrative and 3 Project Staff

5. CENTRAL SERVICES

5.1 Central Library

The Central Library is well equipped having all modern facilities and also rich resources, in the form of CD-ROM, On-line databases and Printed on Applied Sciences, Engineering, Technology, Humanities, Social Science and other new emerging areas. It provides facilities and services to end users given as under:

CD-ROM Literature Search Services:

The CD-ROM services based bibliographical search is now available on a local area network (LAN) with 3 user terminals in periodicals reading hall. The service is available from 9 a.m. to 8 p.m. on working days and 9.00 a.m. to 4.00 p.m. on Saturdays, Sundays and other holidays. The databases currently available are Engineering Index (COMPENDEX) and Science Abstracts (INSPEC). The service has highly been appreciated.

ON-Line Information Retrieval Service

Central Library also provides on-line information access to more than 500 Industrial databases through DIALOG Information Service in USA. The service has been found very useful. The service has been used by the members of Industrial Associate Scheme (IAS) besides IIT faculty, students and staff of the Institute.

Library Orientation

The Library has initiated to conduct CD-ROM Orientation programme for the benefit of the faculty, scientific staff and Industrial Members to familiarize themselves with search techniques.

Library Automation

Central Library has automated Circulation Control which is working satisfactorily. A & P Module is the operation for ordering the new acquisition of publications and printing the catalogue cards. CDS/ISIS package is also used to generate various in-house reports. Periodicals holdings has also been automated. Databases of Ph.D thesis submitted at IIT Madras. Directory of e-mail addresses of Libraries and Information Centres in India and Abroad has also been created.

Library and Information Service Statistics

The following statistics reflect the overall performance of the Library and Information Services during the year under report.

a. Membership

Institute Members (Staff & Students)	3,526
Outside Members	380
Individuals	1138
Corporate	10
Industrial Associateship	232
Consultation Permits	1,420

b. Collection Development Acquisition of Publications

Books	2,638
Theses	90
Pamphlets and Reports	69
Microfilms/Fische	28
Book-bank (General) (BBW)	121
Book-bank (Weaker Section) (BBW)	189
Current Periodicals by Subscriptions	700

Current Periodicals by Exchange/Gift	90
Back Volumes of Periodicals	2,497
Total Accessions at the end of March 1995 (Books & Journals)	5,135
c. Library and Information Services	
Circulation	
Number of Readers visited	1,64,320
Number of Volumes issued	1,82,450
Number of Volumes issued through Book Bank (General)	7,750
Number of Volumes issued through Book Bank (Weaker Section)	5,600
Overdue & other charges collected	Rs.2,10,552
Xerox charges collected	Rs.2,35,780
Reservation for Books	
Registered	11,942
Fulfilled	9,467
Loans	
Department Loan	230
Permanent Loan	950
Inter-Library Loans	
Borrowed from other Libraries	194
Loaned to other Libraries	52
Literature Search	
Literature searches through DIALOG	14
CD-ROM searches by users	360
Reprint Service	
From International Sources i.e. British Library, Canadian Institute of Scientific Information, INSDOC, etc.	79
Translation services	2
Supply of reprints to other libraries	38
d. Audio-Visual Service	
Number of Audio Cassettes	8
Number of Video Cassettes	13
Number of Video Programme screened	62
Number of persons attended	270
e. Reprographic Service	
Number of Xerox copies supplied	8,03,342
DTP output	15,266
Number of copies printed on Rotaprinter	6,92,210
f. Binding	
Number of Books and Journals bound (Internal)	1,773
Number of Miscellaneous Publications bound (Internal)	599
Number of Books & Journals bound through external binders	2,874
Departments work (Miscellaneous)	2,107

g. Visitors to the Library

Students from other Institute (about 30 students per group)	10 groups
Other Visitors	6 VIPS

h. Library Publication

New addition to Library (fortnightly)

Participation of Library Officers In Conference/Wrokshops

Dr. Harish Chandra, Librarian has participated in the IIT Library Meet on Resources Sharing held at IIT Bombay, 21-22, Feb. 1995.

Shri R.Vengan, Deputy Librarian has attended Networks and CD-ROM Networking (Seminar on Recent Advances in Infn.Technology, IGCAR, Kalpakkam, 23 Mar. 1995.

Sri M.Koteswara Rao, Deputy Librarian

Participated in the Worldnet Dialogue on the INTERNET Computer system at the American Centre Library, Madras on 28th July 1994.

Served as Rapporteur for the 3rd National Meet on CDROM On-line users organised by NISSAT at CLRI, Madras during 9-10 August 1994.

Attended the XVI All India IASLIC Seminar hosted by IIT Bombay, during 18-22 December 1994.

Sri C.R.Sekar, Assistant Librarian

Presented a paper on The role of computers in library resource sharing (in Tamil) along with Dr.S.Raman, Dept. of CSE at Tamil Science Congress III Seminar at Pondicherry University, Pondicherry during 24-26 Dec. 1994.

Attended 6th National CDS/ISIS users group meeting held at Madurai Kamaraj University, Madras during 10-13 Jan. 1995.

Sri C.C.Tom, Assistant Librarian has attended the IIIrd National Meet on CDROM-ON-Line users, organised by NISSAT at CLRI, Madras during 9-10 August 1994.

5.2 Central Workshop

The various units of Central Workshop are Carpentry and Pattern Making, Fitter's and Tool maker's shop, Machinshop, Gearshop and Gear testing, Instrument shop, Electrical shop, Foundry and Heat Treatment, Welding shop, Automobile repair, Electroplating shop, Design cell and stores.

Some of the special facilities available are gear cutting, gear grinding and testing (spur and bevel gears), jig grinding, copy milling, manufacture of precision scales, precision instrument repairing, calibration of pressure gauges and dynamic balancing of rotors etc.

Central Workshop undertook fabrication of components, gadgets apparatus etc. required by the various Departments for research and development projects in addition to the regular training programme for the B.Tech and M.Sc. students (600 students)

For giving training in advanced machines like CNC machines, Central Workshop procured 3 CNC Lathes (Trainer) at a cost of Rs.10,00,000/- in the year 1992. Arrangements have been made to procure one CNC milling machine (Trainer) at a cost of Rs.4,50,000/- in the year 1994.

Advanced Workshop course was conducted during the Summer May-June 1994 to the B.Tech students. The following are the details of the work undertaken during the period under report:

No. of Work Orders completed	:	646
No. of students trained in the Advanced Workshop Training during Summer Term Course	:	15

During the above period work of industrial consultancy and Sponsored Research works were undertaken and completed. In addition to the above Institute buses and vehicles were maintained.

5.3 Central Glass Blowing Section

The Central Glass Blowing Section is one of the most important infrastructural facilities of the Institute since its inception in 1972. Being a Central facility this section undertakes design and fabrication of sophisticated scientific glass apparatus for research and development in various departments. Besides meeting the in-house needs, this section also frequently undertakes jobs for the industry consultancy programme.

This section has a range of modern glass working equipment largely procured from the Federal Republic of Germany as a component of the collaborative programme and these include Horizontal cum vertical lathe, Universal lathe, Forming lathe and High Vacuum Systems. It is also well equipped with a good number of sophisticated burners drilling and cutting machines, grinding and polishing equipments, and such other tools necessary for fashioning out a variety of glass apparatus and instruments. Though the services of the section are utilised by the student community and researchers of different departments, its contribution in specialised area like Cryogenic Glass Systems, high vacuum system is quite significant in recent years. The section has adequate facilities for Quartz Working and has developed high level of expertise in this area.

Part of industrial consultancy programme this section has to its credit the following specific works:

Cryostat, Spherical, Cylindrical and Dewars (Window silvering), Luggin probe, Adibetic Calorimeter, Laser housing tube with water jacket, Mercury container for voluminometer, Reaction kettles, Reactor tube, Jet electropolisher, Double walled transfer tube, Vacuum tube collector for solar energy, Quartz wares (Crucible, combustion tube, crystal growing quart sheath etc.) and latest development a Quartz cell for the study of transients by microwave absorption and laser flash photolysis.

5.4 Central Photographic Section

This Section with a staff strength of five experienced technical personnel caters to the needs of various departments/centres of the Institute. It is mainly involved in Slide Preparations, Phototaking for research activities of the faculty members and research workers. It also undertakes development, enlarging and printing and helps various IC and SR activities. It covers the different Institute functions such as Convocation, Sports-meet, Seminars, Symposia, etc. Around 750 work orders were executed during the year under report.

This centre also procures new tools to help in fabrication of most sophisticated glass systems such as hydrogen absorption facilities working on volumetric and pressure reduction methods, to study the hydrogen absorption properties of metals and alloys, and bubble pump evaluation test rig to study the volume flow rate of refrigerant and strong solution various glass diameters for R and D of the various departments of this Institute.

5.5 Central Gas Supplies Unit

The Central Gas Supplies Unit is administered by a Professor. The unit procures the following industrial gases and special gases from various manufacturers/suppliers and issues to various departments/laboratories of the Institute for research and practical classes.

Industrial gases: Oxygen, Nitrogen, Dissolved Acetylen, Argon and Hydrogen

Special gases: High pure Argon, High pure Oxygen, High pure Nitrogen and Zero Air.

5.6 Centre for Continuing Education

The Centre for Continuing Education was established in June 1986 by merging different units connected with Continuing Education Activities, Quality Improvement Programme and Curriculum Development work at the Institute.

Quality Improvement Programme

Since inception 237 faculty members have obtained Ph.D degrees and 318 faculty members have obtained M.Tech degrees under this programme .

During 1994-95, 14 Ph.D scholars and 19 M.Tech scholars were admitted to the above programme; 41 Ph.D scholars and 19 M.Tech scholars were on rolls during 1994-95.

Under QIP, 5 summer/winter schools and under ISTE 3 courses were conducted during 94-95 mainly for teachers of Engineering institutions but also involving a few participants from industry.

A more comprehensive overall Curriculum Development Cell has now been established in order to cater the needs of all departments. During 1994-95 5 proposals from faculty members for preparation of resource materials have been approved under CD Cell Activity.

Two workshops have been conducted under this Cell.

Continuing Education Programme

A total of 22 Continuing Education Programmes were conducted and about 435 participants attend these programmes, during 1994-95. Many industries are coming forward to make use of the expertise of the IIT Madras faculty through these programmes.

Continuing Education Project

During 1994-95, 6 modules were completed, 28 more modules are under various states of preparation. On the basis of the completed modules, it is intended to organize Continuing Education Programme for working professionals.

6. STUDENT AMENITIES AND ACTIVITIES

6.1 Hostel

All students admitted to IIT, Madras are required to reside in the hostels inside the campus. There are 11 men's hostels and 1 ladies' hostel with a total of 2396 single room accommodation.

Each hostel is administered by a Warden and an Assistant Warden. The Warden is assisted by a Hostel Council consisting of student Secretaries and the Assistant Warden in day-to-day functioning of the hostel. The Hostel Management is a centrally administered body and is in overall charge of the functioning of all the Hostels and the Central Supplies Unit. There are 294 hostel employees and they are responsible to the Hostel Management through the respective Wardens of the hostels. The Chairman, Council of Wardens is the Chairman of the Hostel Management. He is assisted by an Assistant Registrar and other supporting staff. During the period under report, the following officers were in position:

Chairman, Council of Wardens and Hostel Management	Dr.P.Srinivasa Rao Professor of Mechanical Engg.
Assistant Registrar	Sri K. Ramaswamy
Name of the Hostel	Warden
Alakananda	Dr.M.S. Shunmugam
Brahmaputra	Dr.D V S Murthy
Cauvery	Dr V Ramakrishna Murthy
Ganga	Dr.S Kumaraswamy
Godavari	Dr.M N Sudheendra Rao
Jamuna	Dr.K Ramar
Krishna	Dr.K M M Prabhu
Mandakini	Dr.K Krishnaiah
Narmada	Dr.S.D. Pathak
Saraswathi	Dr.P C Deshmukh
Sarayu	Dr.Enakshi Bhattacharya
Tapti	Dr.M. Govardhan
C.S.U.	Dr.B Viswanathan

6.2 Central Supplies Unit

The Central Supplies Unit is administered by a Warden. It procures the milk under the Milk Supply Scheme from the nearby villages and from Tamilnadu Co-operative Milk Producers Federation Ltd. and distributes to the student hostels, the residents of the campus and the staff of the Institute residing around the campus.

Under the Provision Supply Scheme, the Unit procures the items of major consumption from the wholesale suppliers and distributes them to the hostels, thus economizing on the mess expenditure in the hostel messes.

6.3 Medical Facilities

Medical facilities are provided to the students in the well equipped Institute Hospital. Advises are given on a wide range of health problems to the students. The details of medical facilities available are given in Chapter 10 - Campus Amenities.

6.4 4 (TN) AIR SQN (TECH) NCC

The Air Wing (Tech) Unit is functioning at I.I.T. Madras from 16th September 1965 to provide NCC Training exclusively to the students of the Institute. Regular IAF Officers and Airmen as PI staff are posted to this Unit and the strength is augmented by part-time Officers and other supporting civilian staff drawn from the Institute. NCC syllabus includes Drill, Weapon Training, Civil Defence, Health/Hygiene, Leadership Training, History of Air Force, Principles of Flight, Air armaments, Radio/Radar aids, Avionics and Instrumentation. The training is imparted by a team comprising of the Air Force elements and the Institute part-time Officers.

The organisation of the unit is as follows:-

Commanding Officer	:	Wg Cdr BP Lohani
Associator NCC Officers	:	Plt Offr A Mani
	:	Plt Offr S Neelamani

- Range firing practice on Rifle, Revolver and 12 Bore gun. -

Two Blood Donation camp at NCC Building through Red Cross Society, Madras by 91 Cadets, One PI Staff and One ANO.

- Cycle Expedition to Thirupathi by 21 cadets.
- Pledging of eyes for donation 11 volunteer cadets.
- Pledging of Anti-dowry by 175 cadets. -

Under Social Service activities NCC cadets of this unit carried out Cleaning and Face lifting of Children's park of this Institute.

4 (TN) Air Sqn (Tech) NCC located within the IIT campus helps to instill a sense of discipline, comradeship, a spirit of adventure and leadership capability in the life of IIT students.

6.5 National Service Scheme (NSS)

1. 60 students of the Institute were registered for N.S.S. for this Academic year, that is 1994-95.
2. 30 students were teaching weaker children in the village of Taramani.
3. 10 students were teaching weaker children at Vana Vani School at IIT Madras.
4. 20 students were engaged in improving the ecology of our campus.

Apart from these regular activities the NSS also arranged the following activities.

1. Lectures on Bhagavad-Geetha were conducted by volunteers, for students and staff in August 1994.
2. In October 94, Yoga classes were organised and conducted for students, staff and campus residents in SAC building for 10 days.
3. Clean-up drives have been in progress from October 94 onwards. The campus has been divided into several sectors and is being attended to step by step.
4. A series of lectures was delivered by Prof. NVC Swamy, Director, IIT, Madras on topics for spiritual improvement.
5. NSS volunteers helped in blood donation camps organised within the Institute.
6. NSS students have been spreading awareness about eye donation among the residents of the campus.

6.6 Gymkhana

Sports Activities:

1. Inter Collegiate Invitation Tournament:

The Institute Gymkhana organised the above tournament from the 27th of August to 6th September 1994. This tournament was held by inviting only some selected colleges in and around the city. This tournament was used for selecting our Institute teams for Inter IIT Sports Meet. Our teams have done creditably in all the games.

Hockey, Football, Volley Ball teams reached the semi- finals. The experience gained thus was the launching pad for our boys at the Inter IIT Sports Meet.

2. IIT - Sports-Star' Inter Collegiate Cricket Tournament:

This year, 20 teams took part in the IIT Sports Star Inter Collegiate Cricket tournament. Guru Nanak College won the finals and regained the Trophy which they lost in the year 1993. Vivekananda College was the Runner-up. In the Semi-final, IIT Madras lost to Vivekananda College.

3. The Inter-IIT Aquatic Meet was conducted from October 15 to 17, 1994. Only 3 IITs took part in the above meet (Bombay, Kanpur and Madras). Bombay won the overall championship in Aquatics.

4. The Main Inter IIT Sports Meet was held from December 16 to 20, 1994. The first two days went on well. From third day onwards, heavy rain stopped all outdoor activities. (Football, Hockey, Cricket, Tennis and Athletics). However, all indoor games, Basket Ball, Volley Ball, Table Tennis, Badminton and weight lifting were conducted successfully in our SAC indoor stadium and old Badminton Court. IIT Madras did extremely well in the first two days leading towards General Championship but were halted by rain.

5. All India Inter-Collegiate Basket Ball Tournament 1995:

This year GFKR Tournament was sponsored by MS Khoday Bio-Tech, Bangalore. The tournament was inaugurated by Dr Gerald Fischer, former FRG Consul on 15th of January 1995. The defending champions RVCE, Banagalore retained the Gerhard Fischer Trophy for the year and Runner was Loyala College, Madras.

The Kokila Rajaiah Trophy for Women went to RV Govt. College Chingleput.

6. Institute Open Bridge Tournament, 1995

The Institute Open Bridge Tournament was conducted from 10th to 12th March 1995 under the auspices of the Institute Gymkhana. IIT Madras students performed very well and won the pair event. In the Swiss League Maha Lakshmi Club retained the shield. The above tournament was sponsored by The Standard Batteries, Madras.

7. Inter Hostel Tournaments:

The Schroeter Trophy for General Championship was keenly contested by Ganga and Mandakini Hostel in the beginning. Ganga by its sheer determination finally won the Schroeter Trophy for the fourth time in succession.

8. Inter-IIT Staff Sports Meet:

For the first time, IIT Madras conducted Inter-IIT Staff Sports Meet from 10th to 12th April 1995. Four IITs took part in the above tournament (Bombay, Delhi, Kanpur and Madras). IIT Madras won the overall Championship scoring 82 points in games and events.

9. Swimming Pool:

After a lapse of seven years, the existing Swimming Pool was renovated and re-commissioned in February 1994. It is functioning very well and maintaining high standards.

In May 1994, Tamil Nadu State Junior Boys Aquatic Meet was held at our Swimming Pool.

The All India Customs Swimming Meet was also held in this Pool during second week of January 1995.

The Swimming Club is conducting 'Learn to Swim' coaching classes for children of Madras city from April 25, 1995 onwards. About 300 children are getting coached in our Pool.

Cultural Activities:

1. The scheme of conducting 'Lit-Soc-Trophy' events introduced in the academic year 1993-94 was continued this year too with success. The winners of the trophy are Godavari Hostel.

2. A three-day Cultural Festival, Bharat Utsav (India Festival) was started this year in October 1994. The programmes included literary and arts competitions with India and its culture as the theme. There were competitions in Patriotic songs, Pot Pourri, Debate, India Quiz etc. Apart from

competitions, there were workshops in Pottery, Stone Sculpting, Paper Making and Doll Making. There were lectures on Poetry, Spiritualism and Yoga. Also conducted were the demonstrations on Kathakali, Folk Music, Classical Music etc. Three Professional Shows, including a Bharathanatyam recital, a Carnatic classical Programme and a Hindustani classical music programme were also held. The programmes were well received by those present. However, the response in general was poor.

3. In the even semester, a one-day staff student interaction programme was held. This programme involved literary competitions where teams consisting of both students and faculty members participated. A panel discussions was also held with both the staff and the students taking part in it. There were lectures by the faculty members on extra curricular topics. Once again, the response of the student community was quite Lukeworm.
4. Stagecoach, the dramatics club revived the year before, put up a commendable performance this year too. The first play they performed was 'Love Letters' which won rave reviews. It had to be performed three times on public demand. In the month of April, Stagecoach staged its last play of the year, 'Wings'.
5. This year, the Independence Day was celebrated with cultural activities. Students from colleges as several city schools took part in the programme which consisted of skits, dances and Patriotic Songs.
6. Mardi Gras '95 was held from January 24 to 29 with the Inaugural Programme of violin recital by Padmashri Lalgudi Jayaraman. Five days of hectic but enjoyable cultural activities followed. In addition to all the usual literary and arts events, lecture demonstrations as well as workshops on Cartooning, Acting, Terracota and Pottery were conducted.

Mardi Gras '95 created a record in terms of outstation participants. Over 400 participants from over 35 colleges from all over the country came down to Madras for the festival. IIT Madras were the top scorers in the overall tally. However, the overall championship was awarded to St. Xavier's, Bombay. There were five professional shows including the inaugural programme during the week, a play, Jesus Christ Superstar, a Light Music Programme by Murali's Sriraag, a Western Music programme by the Embers and finally a Folk music Performance by Sirocco, a group from Australia. The last Pro Show was followed by the Quiz. The major sponsors of Mardi Gras '95 were Pepsi. The co-sponsors were BPL, Titan, Enfield and Hindustan Lever Ltd.

6.7 Guidance & Counselling Unit

- More faculty and student counsellors volunteered to work in the Unit during this year than the previous years.
- A Campus Guide was prepared updating information in the form of a booklet and was made available to every fresh student of under-graduate and post-graduate programmes.
- The first year B.Tech students were distributed to various student counsellors and faculty counsellors for individual attention immediately on arrival to the campus. A deviation this year was that the student counsellors were chosen such that they lived in the same hostels in which their counselees also lived. This had the benefit of informal meetings of the students even during late hours, if help was needed.
- The first year students with their parents and guardians were received by the student counsellors at Madras Central Railway station and were helped in settling down in their stay quickly in July, 1994.
- A get-together of all the counsellors and the parents guardians was arranged to make the fresh students feel much at home.
- Student problems were solved then and there by the counsellors by paying individual attention to the needy.
- The Unit could identify many academically weak students and could arrange for guidance through the senior students who readily came forward to help in subjects like Mathematics, Physics, Chemistry and Engineering Drawing.

- * A few problems of emotional nature also were attended to by the unit with the help of the medical officers of the institute.
- * The unit helped the Medical Officers and the first year students to blood grouping of the first year students done.
- * A lecture to students on "ill effects of drugs" by Dr.Rajkumar, the Psychiatrist of the institute was arranged by the unit and it was well received by the students.
- * The counsellors of the unit met five times this year to exchange their views of each other for an efficient functioning.

6.8 Placement of Students:

During the year 1994-95, 476 students were placed as detailed below:

Branch	No. of students registered for placement	Number placed		Total	No. placed more than one job
		OC	SC/ST		
B.Tech					
1. Aerospace Engg.	21	13	-	13	-
2. Chemical Engg.	44	38	-	38	7
3. Civil Engg.	39	36	-	36	7
4. Computer Science	30	26	3	29	5
5. Electronics & Comm.	37	26	3	29	3
6. Electrical Engg.	41	29	3	32	6
7. Mechanical Engg.	77	60	5	65	20
8. Metallurgical Engg.	27	26	-	26	2
9. Naval Architecture	16	14	-	14	5
Total	332	268	14	282	55
M.Tech					
1. Aerospace Engg.	2	1	-	1	-
2. Applied Mechanics	8	5	2	7	1
3. Chemical Engg.	13	6	1	7	1
4. Civil Engg.	19	13	-	13	5
5. Computer Science	27	20	7	27	8
6. Electrical Engg.	26	18	2	20	5
7. Industrial Management	19	12	5	17	2
8. Mechanical Engg.	42	29	4	33	5
9. Metallurgical Engg.	9	6	1	7	3
10. Ocean Engg.	1	1	-	1	-
11 Solid State Tech.	6	4	-	4	-
Total	172	115	22	137	30

Branch	No. placed	More than one job
M.S.		
1. Aerospace Engineering	3	
2. Applied Mechanics	3	
3. Chemical Engineering	1	
4. Civil Engineering	7	2
5. Computer Science	5	
6. Electrical Engineering	6	1
7. Industrial Management	4	1
8. Mechanical Engineering	9	1
9. Ocean Engineering	1	
Total	39	5

Besides the above, the following were also placed.

M.Sc.	Chemistry	4
	Physics	3
	Mathematics	4
Ph.D	Applied Mechanics	1
	Computer Science	1
	Chemistry	1
	Electrical Engg.	1
	Mechanical Engg.	1
	Ocean Engg.	2

Adviser, Placement and Training : Prof. A Venkatesh
 Deputy Registrar Public
 Relation-cum-Placement & Training : Sri A.K. Patiabiraman

7. FINANCIAL ASSISTANCE TO STUDENTS

Financial Assistance is extended to the meritorious students who are pursuing Engineering, Technology and Science education in this Institute in the form of Scholarship and Fellowships. The details of Scholarship and Fellowship sanctioned to the students of different programmes during 1994-95 are as follows:

7.1 B.Tech.

SC/ST students admitted in B.Tech. programme upto the academic year 1994-95 were sanctioned the concession of free messing plus Rs.70/- p.m. out of pocket expenses exemption from payment of tuition fees and hostel rent as per the post-matric scholarship rules. As on 31.3.95, 27 students were benefitted. The year-wise details of such students are given in Table 7.1.

The Merit-cum-means scholarship of Rs.300/- p.m. were sanctioned to the 25% of the students admitted in B.Tech. programme besides the exemption from payment of tuition fees. During the period under report 51 students got benefitted. The year-wise details of such students are also given in Table 7.1.

Table 7.1

Year	Merit-cum-means scholarship	Free messing (basic manu) and pocket allowance concession to SC/ST students
I	8	8
II	13	9
III	14	4
IV	16	6
Total	51	27

In addition to the above the Institute sanctioned a notional prize of Rs.100/- to the top ranking 25 B.Tech. students in JEE.

7.2 M.Tech.

Students who joined M.Tech. programme admitted through GATE were awarded scholarship at Rs.1800/- per month. During the period under report 237 fresh scholarships and 228 renewed scholarships were given, the department-wise details of which are given below:

Table - 7.2

M.Tech

Sl.No.	Discipline	No. of M.Tech. scholarships awarded	
		Fresh	Renewal
1.	Aerospace Engineering	6	6
2.	Applied Mechanics	8	8
3.	Chemical Engineering	23	23
4.	Civil Engineering	33	32
5.	Computer Science and Engg.	27	26
6.	Electrical Engineering	35	34
7.	Industrial Management	25	20
8.	Mechanical Engineering	54	53
9.	Metallurgical Engineering	12	12
10.	Ocean Engineering Centre	7	7
11.	Solid State Technology	7	7
	Total	237	228

7.3 M.Sc.

Students admitted in M.Sc., programme were sanctioned Rs.300/- p.m. merit scholarship. Exemption from payment of tuition fee were also given to certain students. During the period under report 41 students got benefitted. The department- wise details of such awards are given below:

Table 7.3

Course	Year	No. of merit scholarships awarded	No. of freships without tuition fees in all semesters
Chemistry	I	6	3
	II	7	5
Mathematics	I	8	4
	II	7	3
Physics	I	8	3
	II	5	2
Total		41	20

7.4 M.S.

The scholars admitted in M.S. programme through GATE or equivalent examination are given Rs.1800/- p.m. for three years. During the period under report 211 students received this fellowship of whom 73 were fresh scholars. The department-wise details of the fellowship awarded and renewed are given below:

Table 7.4

Sl.No.	Department	No. of M.S.Scholarships awarded	
		Fresh	Renewal
1.	Aerospace Engineering	1	7
2.	Applied Mechanics	10	20
3.	Chemical Engineering	10	10
4.	Civil Engineering	7	15
5.	Computer Science & Engg.	13	21
6.	Electrical Engineering	14	20
7.	Humanities & Social Sciences	3	6
8.	Mechanical Engineering	9	24
9.	Metallurgical Engineering	2	3
10.	Ocean Engineering	4	7
	Total	73	133

Ph.D.

Scholars who are admitted for Ph.D full-time programme in Engineering fields are sanctioned Rs.2400/- for first two years and Rs.2500/- for another 3 years per month based on their progress. Scholars who are admitted for Ph.D fulltime in the Science fields are sanctioned Rs.1800/- p.m. for first two years and for another three years Rs.2100/- p.m. During the period under report 310 students obtained fellowship of whom 55 were fresh scholars. The department-wise details of the fellowships awarded and renewed are given below:

Table - 7.5

Sl.No.	Department	No. of Ph.D.scholarships awarded	
		Fresh	Renewal
1.	Aerospace Engineering	1	7
2.	Applied Mechanics	4	16
3.	Chemical Engineering	3	27
4.	Chemistry	12	63
5.	Civil Engineering	2	14
6.	Computer Science & Engg.	1	7
7.	Electrical Engineering	2	4
8.	Humanities & Social Sciences	4	17
9.	Mathematics	4	14
10.	Mechanical Engineering	10	27
11.	Metallurgical Engineering	2	14
12.	Ocean Engineering	3	14
13.	Physics	7	31
	Total	55	255

8. WEAKER SECTION AND FOREIGN STUDENTS

8.1 B.Tech:

As per the GOI orders 22.5% of the seats are reserved for SC and ST students in B Tech. programme. They are admitted through the Joint Entrance Examination with a relaxation. These students have to get only 60% of the marks obtained by the last student of the general category to get qualified for admission. 42 SC/ST students joined the B.Tech programme during the academic year 1994-95. During counselling prior to the admission, the advisor explained each student the requirements of different branches. This helped the students in choosing suitable branch depending upon the capability and taste of each student. When a student finds tough in the chosen branch, he is allowed to switch over to other branches depending upon vacancies. Students admitted against reservation are given the following benefits:

1. Travelling allowance (II Class train fare/ordinary bus fare) from the place of residence to Madras to join the B.Tech programme.
2. Free tuition.
3. Free lodging and messing (basic menu) and pocket allowance of Rs.70/- p.m. provided their parents income should be Rs.24000/- net per annum or below as per Government of India revised order.
4. A Book Bank as part of Central Library is maintained for the benefit of SC/ST students. The students are issued 12 tickets for taking books from the Book Bank. Books are issued for a semester.
5. Drawing instrument (Mini-drafter) free of cost.
6. Help in getting placement. Wherever possible, industries are requested to conduct separately interview for SC/ST students and the requirements for these students are lower than that of the general category.

8.2 Preparatory Course for B.Tech.

A preparatory course of one academic year was initiated by Ministry of Human Resource Development, Government of India, during the year 1983-84 exclusively for SC/ST students. Selection for this course is made from the SC/ST students Joint Entrance Examination list who did not get admission through Joint Entrance Examination. After successfully completing the preparatory course at IIT, they will be eligible to join B.Tech programme and they are not required to write JEE again. This Institute conducted preparatory course during 93-94 for IIT Bombay and for this Institute. 55 students joined and out of them 2 discontinued. 56 students qualified for admission to B.Tech programme of which 15 for IIT Bombay and 21 for IIT Madras.

8.3 M.Tech./M.Sc.

22.5% of the seats are reserved for students of SC and ST communities as per Government of India orders. They are admitted through GATE with a relaxation. These students have to get only 60% of GATE percentile obtained by the last student of general category. 65 SC/ST students were admitted to M.Tech programme during the academic year 1994-95.

Admission was made for M.Sc., programme through entrance examinations only.

Students admitted against reservation are given following benefits:

1. Book Bank facility is given with 12 library tickets. Books are issued for a semester.
2. Both Public Sector and Private Sector Industries were requested to recruit SC and ST students and other special steps were also taken to enhance the recruitment of this category of students.
3. Scholarship is given to all students.

8.4 Foreign Students

During the academic year 1994-95, 13 foreign students joined B.Tech programme from the following countries.

Sri Lanka	:	7
Canada	:	3
USA	:	1
Bangladesh	:	1
Mauritius	:	1

Foreign students are also permitted to use Book Bank. 4 Book Bank library tickets are issued to each student. Books are issued for a semester.

9. FINANCE AND ACCOUNTS

The financial year of the Institute corresponds with that of Government of India i.e. 1st April to 31st March of the following year. The accounts of the Institute are annually audited by the Accountant General, Tamil Nadu & Pondicherry, Madras on behalf of the Comptroller and Auditor General of India.

The Finance Committee of the Institute in its meeting held on 7.11.94 recommended the Non-Plan revised estimates 1994- 95 (Gross) for Rs.3088.64 lakhs. With regard to Budget Estimates 1995-96 Rs.3281.05 was indicated. Similarly with regard to Plan the amount of Rs.300 lakhs was indicated subject to review on a later date.

The general view of the revised estimates approved for 1994-95 by Finance Committee is given below:

Head	Rs. in Lakhs			
	Budget Estimates for 1994-95 (as proposed)	Budget Estimates (as allocated by the Board of Governors)	Revised Estimates 1994-95 as per Finance Committee	Budget Estimates 1995-96 (as proposed)
Non-Plan				
Recurring	2802.15	2731.93	2988.64	3181.05
Non-Recurring	20.00	30.00	100.00	100.00
Total Non-Plan	2822.15	2761.93	3088.64	3281.05
Plan				
Opening balance fully committed	112.92*			
Recurring	37.50	25.00	30.00	30.00
Non-Recurring	296.75	387.92#	382.92#	270.00
Total Plan	447.17	412.92	412.92	300.00
Income	405.05	374.00	415.26	429.70

* carry over from 1993-94 account

includes carry over of Rs.112.92 lakhs representing irrevocable commitment of 1993-94

Audit

The Audit Report and the Annual Accounts of the Institute for 1993-94 in English and Hindi versions are being placed separately on the tables of Parliament with due certificates of the Accountant General, Tamilnadu and Pondicherry.

The accounts of the Institute for the year 1993-94 was audited by the Accountant General between July 94 to September 1994. The audited report (English version) on the accounts of the Institute for the year 1993-94 has already been sent to the Ministry of Human Resource Development, Govt. of India.

The salient features of the 1993-94 accounts are given below:

I. Receipts:

1. Opening Balance		1357.14
2. Grant from GOI		2450.00
3. Institute Receipt:		
Fees etc.	51.72	
Application Fees	125.67	
Income from Vehicles	7.86	
Income from Buildings	43.03	
Other receipts	218.41	
		446.69
4. Recovery of Advances		58.73
5. Deposits		1233.10
Total I		5545.66

II. Payments:**a. Capital account:**

1. Buildings and Constructions		140.72
2. Furniture equipment and fittings for Departments	82.35	
Research Centres & Central Services etc.	32.40	
		114.75
3. Library expenses		121.31
4. Others		21.68

b. Revenue Account:

1. Academic Departments/Centres:		
Pay & Allowances of Tech. Staff		522.57
Pay & Allowances of Non-Teaching Staff		244.68
Department expenses		99.82
Library including staff salary		38.61
Central Workshop including staff salary		60.69
Indo-German Projects		0.90
Research Centres including pay and allowances CEC and AC Unit		47.69
Centres, Central Services working expenses		12.96
Rural Development Research Activities		1.35
Institute Scholarship		190.03
Other items		53.44
NCC, NSS and NSO: Pay & allowances & others		3.77

2. Central Administration:

Pay & Allowances		181.14
Hostel		74.39
Stores Pay & allowances		13.87
Security & Fire fighting		5.75
Lawns & Garden		2.36

Services & Maintenance (Telephone, Power, Water, Furniture repair & Maintenance, Oil, Petrol, etc.)	175.95
Medical and Dispensary	31.05
Atheletics and Gymkhana	18.43
Vana Vani Matriculation Higher Secondary School	3.90
Ameneties	0.38
SC/ST Special coaching/Preparatory course	0.17
Guidance & Counselling	0.26
DDF	0.22
3. Works and Maintenance:	
Pay & allowances and other expenses	198.52
4. General Expenses:	
Postage, Liveries, Stationery, Printing etc.	36.05
TA of authorities & Institute's selection committee members, candidates called for interview	7.19
Reimbursement of Stamp duty, sundries, etc.	5.96
PF/Gratuity/Pension	299.73
Advances paid	58.85
Deposits refunded	1042.93
5. Closing Balance	1713.59
Total II	5545.66

10. CAMPUS AMENITIES

10.1 Engineering Unit

The Engineering Unit of this Institute is responsible for construction of new buildings and maintenance of the campus.

1. During the period under report the following buildings were completed and thrown open for occupation:

(Rs. In Lakhs)		
S.No.	Name of Work	Amount
1.	a) Construction of a Building for IC & SR	136.00
	b) Construction of a additional space at first and Second floor level at IC & SR Building (NIOT)	45.00
2.	Providing 11 K V underground cable from Adyar gate sub station to D.P. Structure and IC & SR Sub station	60.00
3.	Construction of additional room and modification works for 'F' type quarters - Block V	11.17
4.	Construction of New Over Head Service Reservoir	25.90
5.	Proposed addition and alteration for Community Hall at IIT Campus	6.00
6.	Renovation and modification works for 12 Rooms (middle wing) at Taramani Guest House	4.91
	Total	288.98

10.2 Guest House

There are two Guest Houses in the Campus viz. VIP Guest House and Taramani Guest House which are having six suites and 30 rooms respectively.

10.3 Hospital

The Institute Hospital consisting of 36 Beds, renders medical facilities to students and staff members and their dependents. Hospital offers out-patient and in-patient services for Medical, Surgical, Obstetric, Gynaecological, Pediatric, ENT and Ophthalmic treatment.

The following are the Officers in the Hospital:

Dr. A. Ganesan, M.D	Chief Medical Officer
Dr. N.A. Jayavelan, M.B.B.S.	Resident Medical Officer
Dr. Lalithakumari, M.B.B.S., D.G.O.	Medical Officer
Dr. S.Aruna, B.Sc., M.B.B.S.	Medical Officer
Dr. C.Sridevi, M.D., D.ch.	Medical Officer
Dr. S.Kameswaran M.S., Ph.D., F.R.C.S.(ED), F.R.C.S.(Glax), F.R.C.S. (D.L.O.)	ENT Consultant (Part-time)
Dr. S.Devaji Rao, M.S. MNAMS, FICS	Consultant Surgeon (Part- time)
Dr. S.Rathanamala, M.B.B.S., D.O.	Eye Specialist (Part-time)
Dr. R.Rajkumar, M.D. DPM	Psychiatrist (Part-time)
Sri L. Palaniappan	Lay Secretary

Ambulance service is available at Hospital and is being used round the clock. One Medical Officer is posted for call duty and is available for all the 24 hours of a day to attend the emergency cases in the Hospital.

Laboratory tests are undertaken for Bacteriological and a few Bio-chemical investigations. Two ECG machines are available with the Hospital. Some major operations for conditions like Hernia and Peptic Ulcer are undertaken in the modernised Operation Theatre.

Immunization for children is being carried out against Polio, diphtheria, tetanus and whooping cough. Family Planning Operations were also conducted at this Hospital besides counselling.

The Statistics on the activities of the Hospital between 1.4.94 and 31.3.95 are as follows:

1.	Total No.of outpatients	79,767
2.	Total No.of inpatients:	
	Male	295
	Female	225
3.	Emergencies attended	3,090
4.	Dressings	11,624
5.	Injections	10,391
6.	Deliveries	5
7.	Pathology	
	Urine	4,822
	Motion	3,680
	Blood	6,331
8.	Bio-Chemistry	
	Blood Sugar	3,362
	Urea	431
9.	Operations	
	General surgery	78
	ENT operations	44
	Eye operations	18
	Minor Operations in Surgeon's room	147
	Obstetric Procedures	
	I.U.D.	12
	ECG	558
	Vaginal Dauches	36

10.4 Bank

State Bank of India main Branch is functioning in the campus with two extension counters - one at shopping centre and the other near Narmada Hostel. An extension counter of Canara Bank is also functioning in the campus.

10.5 Post Office

There is a post office in the campus opposite to State Bank of India to cater to the needs of the staff, students and residents of the campus.

10.6 Schools

Vanavani Matriculation Higher Secondary School administered by IIT employees Educational Society is functioning in the campus besides a Central School. These schools are offering courses from L.K.G. to XII Standards.

10.7 Open Air Theatre

The Open-Air Theatre is utilised for screening Films by Film Club during week end and for other functions of the Institute and Schools.

10.8 Student Activities Centre

This building is utilised for indoor games of the students as well as for conduct of important functions such as Convocation etc.

10.9 Cafeteria

There is one Canteen - namely IIT Campus Canteen, in the campus to cater to the needs of staff and students.

10.10 Bus Services

The Institute is having Omni Buses which provides transport facility to the staff, students and residents of the campus.

10.11 Campus News

The Campus News is published every Friday highlighting the important events of the Institute.

LIST OF MEMBERS OF COUNCIL OF IITS

S.No.	Name of the Representing Organisation	Name and Address
1.	Ex-officio - Chairman	The Minister-in-Charge of Technical Education in the Central Government
2.	Chairman of each Institute (Ex-officio)	
	i. Kharagpur	Shri L. M. Thapar (Chairman, Board of Governors IIT Kharagpur) Kharagpur 721 302.
	ii. Bombay	Dr. R. Chidambaram (Chairman , Board of Governors IIT Bombay) Secretary Atomic Energy Commission Dept. of Atomic Energy, Bombay.
	iii. Madras	Dr. M.S. Swaminathan (Chairman, Board of Governors IIT Madras) Chairman, M.S. Swamination Res. Foundation, 3rd Cross St., Taramani Institutional Area Madras 600 113.
	iv. Kanpur	Shri Govind Hari Singhania (Chairman, Board of Governors IIT Kanpur) Vice Chairman & Managing Director JK Synthetics, 3, Barakhamba Road, New Delhi 110 001
	v. Delhi	Dr. P.J. Kurien (Chairman, Board of Governors IIT Delhi) AB-77, Shahjahan Road, New Delhi-110 011.
3.	Director of each Institute Ex-officio	
	i. Kharagpur	Prof. K.L. Chopra Director IIT, Kharagpur 721302.
	ii. Bombay	Prof.S.P. Sukhatame Director IIT, Bombay 400 076.
	iii. Madras	Prof.N.V.C . Swamy Director IIT, Madras 600036.
	iv. Kanpur	Prof.R.C. Malhotra Director IIT, Kanpur 208 016.
	v. Delhi	Prof. V S Raju Director IIT, New Delhi 110 016
4.	Chairman University Grants Commission Ex-Officio	Prof. Ms. Aramita Desai Chairman, University Grants Commission Bahadur Shah Zafar Marg, New Delhi 110 002

- | | | |
|-----|---|--|
| 5. | Director-General
Council of Scientific & Industrial Research | Dr. S K Joshi
Director- General,
CSIR, Rafi Marg, New Delhi 110 001. |
| 6. | Chairman
Indian Institute of Science Bangalore
(Ex-officio) | Dr.Raja Ramanna
Chairman
Indian Institute of Science, Bangalore 560 012. |
| 7. | Director
Indian Institute of Science Bangalore
(Ex-Officio) | Prof. G. Padmanabhan
Director
Indian Institute of Science, Bangalore 560 012. |
| 8. | Three Nominees of the Central
Government | |
| | i. To represent the Ministry concerned
with Education | Sri S.V.Giri
Secretary to Government
Min. of Human Res. Dev., Dept. of Education
New Delhi 110 001. |
| | ii. To represent the Ministry of Finance | Ms. Sujata Chauhan
Financial Adviser
Min. of Human Res. Dev., New Delhi 110 001. |
| | iii. To represent any other Ministry | Dr. D Swaminadhan
Member (Tech & Higher Education)
Planning Commission
Yojana Bhavan, New Delhi 110 001. |
| 9. | Nominee of the All India Council for
Tech. Education | Prof. S.K. Khanna
Chairman, AICTE
Indira Gandhi Sports Complex (Coaching Block)
Indira Gandhi Indoor Stadium, New Delhi 110 002. |
| 10. | Nominees of the visitor (Minimum - Three)
(Maximum - Five) | Dr. M . Santappa
Scientific Adviser
Tamilnadu Pollution Control Board
25, Dr. Radhakrishnan Salai, Madras 600 004.
Dr. A. P. J. Abdul Kalam
Scientific Adviser to the Minister of Defence
South Block, New Delhi 110 011
Dr. Vasant Gowariker
Scientific Adviser to the Prime Minister
2, Lodi Estate, New Delhi 110 003
Dr. M. M. Sharma
Dept. of Chemical Engg., Univ. of Bombay,
Matunga, Bombay.
Dr. Kamla Chowdhry
(Former Prof. of Management)
IIM, Ahmedabad
Flat No.2A, 33 Prithviraj Road, New Delhi. |
| 11. | Three Members of Parliament (Two from
Lok Sabha and one from Rajya Sabha), | Shri Indrajit Gupta, MP
41 Western Court, New Delhi.
Shri Anandgajapathi Raju, MP
Poosapati, 6, A.P. Bhavan, New Delhi.
Prof.M.G.K. Menon
28 Lodi Estate, New Delhi.110 003. |
| 12. | Secretary | Sri S.D. Awale
Jt. Education Adviser(T)
Min. of Human Res. Dev.
Dept. of Education, New Delhi 110 001. |

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