ANNUAL REPORT

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BIRLA INSTITUTE OF TECHNOLOGY
MESRA, RANCHI (INDIA)

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C O N T E N T S

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VICE-CHANCELLOR'S NOTE

The year under review has seen far reaching changes in the economic structure of the country. The open market economy with rupee floating in the international market, the signing of the Dunkel draft, the adoption of ISO 9000 family standard for quality control in production, the Trade oriented intellectual property rights (TRIPS) etc. focussed attention on economic accountability, quality production, and liability internationally.

Consequent on these changes several readjustments in the economic planning of the Universities and Research establishments is imperative. Due to paucity of funds, the Government of India has reduced the financial support to Universities drastically. In addition, the Government has imposed the need for accountability, with a more realistic fee pattern and generation of financial resources to meet the expenditure.

The message from the Government is that considerable funding has been made for Research & Development and, human resources without a reasonable return to the country in terms of intellectual property rights, consultancy, national industrial development of products and processes, and reduction in foreign consultancy and know-how charges.

Until trade oriented intellectual property rights (TRIPS) came into force, the research establishments and universities were involved in pure academic research, whereas all the developed countries are utilising Indian intellectual resources to build and expand their economic capability.

With this background, the Birla Institute of Technology has taken a number of bold steps in the years past, in establishing Industry - Institution interactions. In fact

interactions goes back to more than two decades, and is a pioneer in establishing SIRDO, SIRTDO, & BIT-STEP activities. The approach valid now is to use all these resources to make the university system viable and exemplary.

The modest efforts were continued this year in utilising the excellent infrastructure in the departments. Efficient Research and Development is essentially inter-disciplinary in nature. Orientation and coordination of the curricular programmes need be well directed to utilise the potential of all students. Much of the inspiration of the entry students is dampened by standard syllabi during the formative period. The effects of advanced technologies can be effectively exposed by well organised demonstration cum lecture sessions calculated to inspire the freshers to aim high. The academic loading pattern will be to keep the student mentally occupied and responsive to ideas and solutions to challenging problems. Selective study in a multi disciplinary environment is the key.

The Institute has established excellent credibility to handle intricate Industrial problems in an innovative atmosphere. As a result of these efforts IIT, Kharagpur has indicated its interest to collaborate in this effort. We intend sharing our industrial developmental capability with resource sharing, for mutually benificial projects. We hope to continuously focus attention on industry-institute interactions with industry participation for product and process development, resource sharing between Institutions, directing all the efforts to yield a strictly time-bound output.

During August, the accreditation committee of the AICTE visited all the Departments and have expressed satisfaction with the facilities and teaching standards.

They have accredited also the new programmes namely Bachelor of Architecture and Polymer Engineering subject to getting funds. The Department of Science and Technology, Government of Bihar has agreed in principle to support these two departments.

The Birla Institute of Technology in collaboration with the Bihar Renewable Energy Development Agency and the Birla Institute of Scientific Research has established a 400 sq.mtrs. Salt Gradient Solar Pond which has stabilised during June 1994. The storage zone temperature of the solar pond has reached 70° C. Inspite of incessant rains during the past three months, the temperature of the storage zone continues to be at 67-68° C. The thermal energy stored can be utilised for generating 4 kW of electrical energy on continuous basis. It is being proposed to use the thermal energy for vapour absorption cycle refrigeration. Direct energy conversion using peltier effect is under active study.

The Institute participated actively in the Rajeev Gandhi National drinking water mission and has conducted revalidation study of net covered rural habitation in Bihar. The final report is under process.

An Indo-Russian Technology Centre at Birla Institute of Technology has been accepted by the Government of India, and the first interactive programme is expected this year. We trust that this would be just the beginning of a major programme.

B.I.T., Mesra, Ranchi
Dated: July 31, 1994.

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ADMINISTRATION

B.I.T., Mesra is a 'deemed University' under Sec. 3 of the UGC Act, 1956. It functions under the overall supervision, direction and control of a high-power Board of Governors, comprising representatives of the Ministry of Education, Government of India, the UGC, the State Govt., the Chancellor, the AICTE, the Trust and the Institute Faculty. Mr. G.P. Birla is the Chairman of the Board of Governors. The Governor of the State of Bihar is the Chancellor of the Institute. Composition of the Board of Governors is given in Annexure - I.

The Technical Council decides the academic policy of the Institute. It controls and approves the curriculum, courses and examination 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 Vice-Chancellor of the Institute is the Chairman of the Technical Council. Members of the Technical Council are listed in Annexure - II.

Financial advice to the Institute is given by the Finance Committee whose constitution is given in Annexure - II. Similarly, the Building & Works Committee advises the Institute in matters relating to building works activity. The constitution of Building & Works Committee is also given in Annexure - II.

In addition, there are a number of other committees like the Regulation Committee for Under-graduate and Post-graduate courses, Examination Committee for Under-graduate and Post-graduate courses, Semester Programme Co-ordination Committee, Admission Committee, Scholarship Committee, Students' Welfare Committee etc. These Committees are appointed by the Technical Council to help the administration in the efficient running of the Institute.

GENERAL REVIEW

BRIEF HISTORY

The Institute was established as an All India Institute for imparting Technical Education and Research in 1955 by the Hindustan Charity Trust. Initially it functioned as an affiliated college of the erstwhile Bihar University and later in 1960 upon creationof new Universities in the State, its affiliation was transferred to the Ranchi University.

In pursuance of the recommendations of the Education Commission, Government of India (1964-66) and on the basis of the report of a Jt. Selection Committee of the UGC and AICTE, in March 1972, the Institute was granted the status of an 'Autonomous' College by making special provision in Bihar State Universities Act. The Rules for its governance were made by the Chancellor of the Universities of Bihar.

On the basis of its continued excellence, and approval by the UGC, the Institute was declared a "Deemed University" in August 1986 under Section 3 of the UGC Act.

Since its inception the Institute is updating its academic standards, and has now acquired a pride of place in Technical Education and is one of the Premier Institute in Eastern India.

COURSES & DEGREE PROGRAMMES

Currently it is offering a variety of curricular programmes as detailed below:

Course	Intake capacity	Duration of course	Year of introduction of the course
I. BACHELOR'S DEGREE COURSES			
1. Electrical & Electronics Engg	45	4 years	1955
2. Mechanical Engg.	60	do	1955
3. Civil Engg.	45	do	1957
4. Electronics & Comm. Engg.	60	do	1964
5. Production Engg.	30	do	1964
6. Pharmacy	30	do	1972
7. Computer Science	30	do	1983
8. Architecture	20	5 years	1993
II. MASTER'S DEGREE COURSES			
1. Electrical	12	1½ years	1964
(i) Control Systems (ii) Power System			
2. Mechanical	6	do	1964
(i) Heat Power Engineering			
3. Civil	2	do	1965
(i) Soil Mechanics (ii) Structural & Foundation Engg.			
4. Electronics & Communication	12	do	1965
(i) Instrumentation (ii) Microwave			
5. Space Engg. & Rocketry	10	do	1965
(i) Rocket Propulsion (ii) Aerodynamics			

Course	Intake capacity	Duration of Course	Year of introduction of the course
6. Business Administration (i) Marketing (ii) Finance (iii) Systems (iv) Industrial Management	30	2 years	1980
7. Pharmacy (i) Pharm. Chemistry (ii) Pharmaceutics	10	1½ years	1983
8. Computer Applications	30	3 years	1984
9. M.Sc. Bio-Medical Instrumentation	15	2 years	1992
10. M.Sc. Information Science	15	2 years	1993

III. P.G. DIPLOMA COURSES

1. Business Administration	30	1 year	1982
2. Computer Applications	30	1 year	1988

IV. CONTINUING EDUCATION(Part-Time) POST-GRADUATE PROGRAMME

To enable working Engineers to update their technologies, the part-time Post-Graduate Programme offers 3 levels :

1. A Certificate of Merit after completing 5 units
2. A Diploma after completing 10 units, and
3. A Degree after completing 15 units.

The disciplines are :

1)	Civil Engineering	:	Structural Design
2)	Electrical Engineering	:	Control Systems & Power Systems
3)	Mechanical Engineering	:	Design of Mechanical Equipment
4)	Production Engineering	:	Industrial Automation
5)	Management	:	Marketing, Personnel, Industrial Management, Finance and Systems.
6)	Computer Applications	:	-

In addition to above, full-time programmes in Bachelor's in Polymer Engineering and Master's in Hospital Administration have also been approved and are going to be started soon.

VI. DOCTOR OF PHILOSOPHY

The Institute offers Research Programmes leading to Ph.D. Degree in all the above disciplines.

ENROLMENT

There are 1685 students who have enrolled during the current Academic Year 1993-94. The Branch-wise enrolment is detailed below. Of these there are 196 girl students and 59 foreign students:

	Full Time	Part Time	
B.E.	1105	-	
B.Arch.	13	-	
B.Pharm.	98	-	
M.C.A./D.C.A.	147	39	
M.B.A.	58	42	
M.Pharm.	18	-	
M.E.	70	61	
Bio-Medical Instrumentation	22	-	
Information Science	12	-	
	1543	142	= 1685

FACULTY & STAFF

Against the sanctioned strength of 173 Faculty positions, 144 are filled with 29 vacancies. The break-up is as follows:

Category	Sanctioned Strength	In Position	Vacancies
Professors	50	40	10
Associate Professors	55	38	17
Lecturers/Associate Lecturers	68	66	2
	173	144	29

The number of administrative and supporting staff are approximately 250. In addition, there are about 300 Class-IV Staff to look after the General Maintenance of electricity, water supply, Gardens, Security, Hostels and allied services. It may also be mentioned that under the Welfare Programme for the weaker sections of society specially from villages adjoining the Institute Campus, the Institute has engaged about 150 persons as Trainees/ Apprentices in various technical and other trades. While under training these persons are paid some allowance/stipend on a regular monthly basis and they are absorbed in regular posts against vacancies arising, from time to time.

All academic staff have been provided accommodation on the Campus.

About 60% of the administrative and other supporting staff have also been provided accommodation on the Campus.

OUT-TURN OF GRADUATES & POST-GRADUATES

During the year 1993-94, 483 students have qualified for the award of Degrees and Diplomas of the Institute; 314 for Under-graduate Degrees (B.E./B.Pharm.) and 169 for Post-graduate Degrees (M.E., M.Pharm., M.B.A., M.C.A. & D.C.A.) and 2 for Ph.D. Degree; the break-up is as follows:

	No. of students graduated in 1993-94		Total No. of graduates upto 1993-94
I. Under-Graduate Degree			
B.E. (4-Yr.) Degree Course			
Civil Engineering	21		
Computer Science	31		
Electrical & Electronics Engg.	67		
Electronics & Comm. Engg.	79		
Mechanical Engineering	82		
Production Engineering	18	298	8907
B.Pharm. (4-Yr.) Degree Course		16	410
			9317
II. Post-Graduate Degree			
M.E.			
Civil Engineering	5		
Electrical Engineering	7		
Electronics & Comm. Engg.	9		
Mechanical Engineering	6		
Space Engg. & Rocketry	6	33	368
M.Pharm.		12	119
M.B.A.		54	570
M.C.A.		42	233
D.C.A.		28	134
			1424
III. Ph. D.		2	34*

*Note : The figures indicate the Ph.D. Degrees awarded after the Institute's becoming Deemed University in 1986.

CAMPUS AND PHYSICAL FACILITIES

The Institute is fully residential and extends over 780 acres. The main buildings of the Institute covers an area of over 30,000 sq. mtrs. and accomodates the various research and training laboratories, administrative offices, lecture rooms. The Workshop annexe has a covered area of 4,000 sq. mtrs. The laboratories and offices of the Department of Space Engineering & Rocketry are situated for security reasons in a sub-campus, about half a kilometer away.

For the convenience of working Engineers to participate in Post-graduate programmes a technology Centre was established in Ranchi City at Lalpur in 1976.

The campus is self contained amidst well laid lawns, with its own protected water supply, marketing centre, dispensary, bank and schools.

II. Description of Buildings on the Institute

1. Institutional Buildings	Sq.mtrs.
i) Main building & Administrative Block	3700
ii) Class room and laboratories, Drawing Halls, Staff rooms etc.	9300
iii) Library Block	2600
iv) Space Engg. & Rocketry Block including explosive and Rocket Fuel Centre	930
v) Workshop Sheds, General Stores, Garrage/Godown	3721
vi) Gymnasium	850

2. Others	Sq.mtrs.
i) Animal House	400
ii) NCC Block	400
iii) Primary/High School (temporarily housed in Mechanical Engg. Block	744

Note: During the year 1987-88 a Navodaya Vidyalaya has also been established in the Institute campus. Presently it is housed in temporary sheds constructed for the purpose. The work of construction of Navodaya Vidyalaya Complex is in progress.

III. Residential Complex

i) Staff Quarters in different categories	300
ii) Residential Complex for supporting services: Forest Guards, Diary, Shop Keepers, Washermen etc.	70

IV. Hostels

i) Seven Boy's Hostels	1410 Single Rooms
ii) Two Girls' Hostel	140 Rooms
iii) One Foreign Students' Hostel	70 Rooms

V. Guest accommodation

The Institute maintains two Guest Houses. A General purpose Guest House with 8 furnished rooms and a VIP Guest House with 3 deluxe double bed-rooms to accommodate guests appropriately.

VI. Auditorium

To meet the growing needs of the community for public functions an Open Air Theatre is partly completed and can seat 2500.

There is also a Mini-Auditorium with seating capacity of 450 in the main Administrative Block.

VII. Games & Sports

The Institute has a Gymnasium and is spacious enough to accommodate indoor games. Extensive play grounds are provided to facilitate sports. They are:

1.	Field Tracks for Sports/Atheletics/ Cricket.	-1
2.	Football ground	-2
3.	Hockey grounds	-2
4.	Basket Ball grounds	-4
5.	Volley Ball grounds	-6
6.	Tennis Courts	-6
7.	Badminton Courts	-6(1 indoor court)
8.	Rifle Firing Range	-1
9.	NCC Parade ground	-1

VIII. Canteen services

A Moderately furnished canteen, provides snacks for students and staff.

IX. Dispensary-cum-Health Unit

A eight bed health care unit serves the large campus community mainly as an outdoor patient unit. This unit supports three full time doctors. Excellent rapport exists for acute medical needs with the Government Medical College Hospital at Ranchi. The construction of the new Hospital building is nearing completion.

X. Marketing Centre

A well run Cooperative Stores provide the daily requirements of the campus of nearly 5,000 residents. Additional shopping complex is provided for sundry needs.

We hope to establish a full fledged marketing centre and cooperative Book Store to meet the growing needs of the campus. The annual needs exceeds Rs. 2 crore mark. The construction of Marketing Complex is in progress.

CENTRAL FACILITIES

COMPUTER CENTRE

Computer Centre provides the central facility for the students and staff-members of the Institute. It started in 1982 on a modest scale with PDP-11/34 Mini Computer from D.E.C., U.S.A. The Centre has been upgraded from time to time not only to meet the ever increasing requirements of the Institute but also the training facilities for the outside user. SN-73 which is upward compatible to PDP-11/34 has been installed and large number of BBC Micro-computers, IBM-PC's, PC-XT's and a PC/AT Computer are used continuously by the users. the software support includes FORTRAN-77, BASIC, COBOL, PASCAL, C, LISP and PROLOG. Local area network (LAN) using 80386 based file server has also been installed very recently.

With support from the Department of Electronics, Government of India, a 'Resource Centre' for Computer Literacy and Studies in Schools (CLASS) has been established in this Institute in 1984. A series of 3 weeks duration training programme are organised for the school teachers from various schools of the eastern region. Under this programme after training the school teachers in the effective use of computers, the respective schools are given two BBC Micro-computers with all the necessary software. The maintenance of these computers and software needs of the schools are met by the BIT resource centre.

In addition to providing the educational and training facilities the Computer Centre has completed many software projects. It is maintaining the pay-rolls for the Institute and academic transcripts of all the students.

With the support from Department of Electronics, Government of India, we are acting as a Research Centre for MCA Teachers Re-orientation Training Programme from the year 1988. The participants are selected on all India level which will benefit the participating teachers for their re-orientation of MCA courses at Post-graduate level.

LIBRARY

The Library subscribes over 225 Indian and foreign journals annually. During the current year 2200 volumes were added to the existing stock of library. The up-to-date stock of the library comprises of 56,200 books and 15,000 back volumes. Facilities for microfilming and photocopying are also being provided by the library.

Decisions has been taken to go for the data-based and on-line information retrieval services. The basic infrastructure has been built up and services are likely to be started from the last week of September 1994. On-line information retrieval facility will also start operating from the last week of September 1994 through DIALOG.

ACADEMIC INNOVATIONS, RESEARCH & DEVELOPMENT

With the support of the Government of India during 1993-94, the Institute has been able to establish and develop infrastructure for interdisciplinary area of research, and instructions in Engineering, Pharmaceutical and Applied Sciences. Additional facilities have been created for Post-graduate studies and research in the area of Applied Sciences to meet the needs of specialized research workers and teachers. New programmes for Industry-Institute interaction have also been developed.

During the year under report the following new academic programme has been introduced:

1) M.Sc. (2-Yr.) Information Science.

The following full-time programmes have already been approved and it is proposed to introduce these in the next academic session:

1) B.E. (4-Yr.) Polymer Engineering
2) P.G. Diploma (1½-Yr.) in Hospital Administration.

Further, the Institute has submitted the proposals for approval of the appropriate professional bodies and the Board of Post-graduate Education, Government of India, for introducing the following new programmes:

1) M.Sc. Electronics

2) M.Sc. Applied Sciences

3) M. Pharm. in Pharmacognosy and Pharmacology

4) M.Tech. in Bio-Technology

In pursuance of the new Education Policy of the Government of India, the Institute is keeping pace with the latest technological advances in identified areas of emerging technologies and is creating and establishing necessary infrastructure for Education, Research and Training. The Microprocessor Development Centre has already established a rapport with SAIL, MECON, CMPDI, HEC etc. for design and development of instrumentation and control systems for real time Computer controls. Artificial intelligence and Robot technology are being moved from the research domain to the solution of practical problems. Further, the efforts are being made for commercial exploitation of various technologies developed at various Centres/ Departments.

MICROPROCESSOR RESEARCH CENTRE

The Microprocessor Research Centre has been expanded to facilitate applicatiion programming on fast 32 bit processors namely:

1. 6820 at 25 MHz, programming and real time trigger trace with performance analysis.
2. IMST 414 Transputer System for 32 bit multiprocessor environment, emulation using PC-XT, to yield system throughout upto 10 MIPS, using occam language.

Both these system design facilitates are unique in the eastern sector, and gives BIT the design ability on fast real time processor based system development.

The Hewlett-Packard 9000-350 system has been installed for AI applications with UNIX-OS C, Prolog, and Lisp and assembly language facility. The system is the state of the art machine capable of expansion. Currently the HP 9000 is networked with two HP 64000 development stations to constitute the 'HP-Design Centre'.

ROBOTICS LABORATORY

An intelligent Robotics laboratory consists of these robots:

1) An IEEE Hero robot with 4 degrees of freedom capable of ultrasonic sensing, Dynamic mobile object sensing speech synthesis etc.

2) Rhino Robot XR-3 and XR-4 are five axis revolute coordinate robot arms with a motor driven gripper XR-3 can be extended to 22.5 inches and has a lifting capacity of 2.2 pounds XR-4 has a lifting capacity of 4.0 lbs.

The laboratory has completed the following projects:

a) Gamma Ray thickness Gauge for Tinplate Company.

b) Non-contact automatic length measurement system for Usha Industries.

c) Control of Ortho cyclic winding machine for Usha Industries.

d) Eddy current inspection of fast moving tinplates.

Collaborative programmes are initiated with local R&D groups for automatic gauging of rolled steel items by laser techniques combined with Microprocessor instrumentation, in-circuit PC-based checking of industrial PCB's using PC-XT and the development of specialised programmes for public sector industries.

PLASMA ENGINEERING

Since the last few years, the Institute has been actively engaged in developing Plasma Technology facilities. Some of the major facilities available at present are:

1) A Cascaded Plasma Arc Generator (Power - 18 KW, Hypertherm U.S.A.). It can produce thermal plasmas of Ar, N_2 H_2, He etc. which may be used as a 'Heat Source' for screening materials for high temperature applications (thermal shock, thermal stress, ablative materials etc.) and for materials processing applications.

2) Two glow discharge units equipped with vacuum units (Rotary and Diffusion pumps) having capacity to reach vacuum of the order of 10^{-6} Torr.

3) A very HIgh Resolution Grating Monochromator (Model THR, JOBIN YVON, Resolutions of 175,000 in single pass and 350,000 in double pass and dispersion of 2.6 A°/mm in single pass and 1.3 A°/mm in double pass. This along with Fibre Optic Couplers, Photomultiplier tube and Read out system is now being developed as a non-intrusive plasma diagnostic technique based on Optical Emission Spectroscopy(OES) for the study of plasma parameters.

An inter-disciplinary project on "Study of Arc Plasma Characteristics of a Cascaded Arc Plasma Generator" has been sanctioned by Ministry of Science & Technology, DST, New Delhi to Dr. R.C. Prasad of the Electrical Engg.Department as Principal Investigator and Dr. P.K. Barhai of the Applied Physics Department as Principal Co-investigator. The basic aim of this project is to characterize the Plasma produced by Cascaded Plasma Arc Generator using OES and radial heat flux distributions.

Another project on "Metallic Multilayer Surface Coating Using Anodic Vacuum Arc" submitted by Dr. P.K. Barhai as Principal Investigator and Dr. R.C. Prasad and Mrs. A. Jain as Co-Investigators to ISRO has been recommended by Vikram Sarabhai Space Centre, for funding under response.

In addition to the above R&D activities, the Institute is also engaged in setting up a Basic Plasma Experiments Laboratory for Under-graduate Engg. students.

FLEXIBLE MANUFACTURING AUTOMATION LABORATORY

Product and process development is a continuous process in any industry. Rapid advances in manufacturing technology with computer controlled processes and management information system, are reinforcing the recognition that specialized training on manufacturing is necessary for their potential to be realised. Realizing the need for an integrated programme on the development of Automation Technology, a Flexible Manufacturing Automation Laboratory has been set up in the Department of Production Engineering. Setting up of this laboratory is a step in the methodology of unmanned manufacturing. The laboratory is designed to carry out experiments on various aspects of automation as applied to Production Engineering field.

The equipment and machineries installed in the laboratory include:

1. CNC Trainer Lathe (EMCO)
2. CNC Trainer Milling (EMCO)
3. A complete FMC comprising of -
   a) TRIAC CNC Milling Machine
   b) ORAC CNC Training Lathe
   c) Conveying system with Conveyer
   d) Two MOVEMASTER Robot
   e) PC and PLC Control System for co-ordinating control actions of different elements (DENFORD).
4. Co-ordinate Measuring Machine (CMM - KEMCO)

The laboratory offers excellent opportunities for carrying out research in the areas of CAD, CAM and Robot assisted flexible automation. Some of the projects on which the work is presently in progress include :

1. PETRI-NET Modelling of Automated Manufacturing System.
2. CAD for Toolings.

3. Communication Network in CIM.

4. Design and development of Robotic Workstation.

5. Knowledge based system for FMS.

6. Robotic End - Effector - Toolings and Grippers.

ENVIRONMENTAL ENGINEERING LABORATORY

With the increased awareness about environment it has become necessary to have a well equipped laboratory where the testing facilities for various environmental pollutants can be carried out with precision and speed. With this object in mind an Environmental Engineering Laboratory has been set-up in the Department of Civil Engineering. The laboratory is well equipped with Scalar Analyzer which is microprocessor controlled and has a capacity to test 37 parameters at a time. The data system can handle upto 16 channels simultaneously. All channels are displayed on CTR. The data system stores all the rawdata for post run manipulations, achieveing, transfer and reformatting of reports. Curve generation in all channels is an added attraction.

The laboratory is being used for regular training to Under-graduate and Post-graduate students and also for carrying out consultancy work of various industries.

CENTRE FOR HISTORY OF SCIENCE

The Centre is engaged in studies in the evolutionary aspects of scientific development. The Centre is headed by internationally reputed scientist, Dr. R.C. Gupta. The Centre is growing continuously with richer collection of books, journals and other materials for further investigation. About 400 research papers, articles, notes and reviews have been published in Indian and foreign journals from the Centre. New findings in the field of history of mathematics and astronomy (including transmissions) have been brought to light besides bio-bibliographical materials. A set of 16 popular articles have been published under the series "Glimpses of Ancient Indian Mathematics". The book entitled "Historical and Cultural Glimpses of Indian Mathematics" written by Dr. R.C. Gupta is being published by N.C.E.R.T. The work on Jaina Mathematics is also being published shortly.

THE BUILDING CENTRE (Nirman or Nirmithi Kendra)

The Rural Housing Development Centre which was working under the aegis of National Building Organisation has been converted to Building Centre under the National Net Work funded by Housing Urban Development Corporation. Housing Development has various complex dimensions, an important one being the use of appropriate building technologies. A specific function of Building Centre is to propagate appropriate low cost building technology for meeting the massive housing needs which are environmental friendly.

Considering that the tribal belt of Chotanagpur area is unique in its composition and culture, needs self employment oriented trades to aleviate their economic condition. Building Centre has initiated some innovative training programme in the area of low cost technologies such as skill upgradation for masons, artisans, carpenters. Further,

rural tribal youths are trained to cater to the local needs in the art of low cost building technology, thus indirectly creating a work force in the rural area for nation building activity.

Building Centre will provide design services matching the local needs. Further it acts as a Nodal Point to develop entrepreneurship in manufacture and marketing of low cost building components.

DEPARTMENT OF ARCHITECTURE

The course in Bachelor of Architecture, approved by the AICTE, was started in 1993-94 with an intake of 16 students. Laboratory as well as library facilities are being built up. The course structure as suggested by Board of Studies, has already been approved by the Technical Council of the Institute.

DEPARTMENT OF CIVIL ENGINEERING

In addition to Under-graduate and Post-graduate programmes, the Department of Civil Engineering has an active and varied research programme. Current areas of interest include Geosynthetic applications in the field of erosion control, river basin development, management models and hydraulic modelling, analysis of ring foundation, stone column innovation, soil-structure interaction, deep excavations and related ground movements, buckling of layered plates, elastic buckling of partially bonded plates, non-prismatic folded plates, reinforced carbels, stability of cuts and embankments, pile raft system, ground water pollution and management, environmental geotechnics, influence of adverse environmental condition on composite material columns.

The faculty of the Department has been engaged in teaching, research and consultancy country-wide. Recent consultancies include flood protection, embankments to salvage abdoned mines for Central Coalfields, evaluation of drinking water facilities in the state of Bihar for Rajiv Gandhi National Drinking Water Mission. In addition to this, training programmes for field engineers in the area of environmental engineering (sponsored by UNICEF), stability analysis of ground coal bunkers for Northern Coal Field at Bena, Madhya Pradesh, and subsurface investigation of base workshop for coal fields at Kathara are also being investigated.

The Department has been involved in a meaningful interaction with industry almost from its inception. A Building Centre is one such project being established with the help of Housing and Urban Development Corporation at the industrial estate. The Department imparts special courses for field engineers to develop their skills, and technical knowledge required to implement specific development projects.

The Under-graduate and Post-graduate projects are oriented towards the social needs of the country at large. An innovative idea to provide opportunity for some students to carry out data collection in the rural tribal areas to make engineering education relevant to social needs is being introduced. The Civil Engineering course structure is modular with central core of subjects which form an essential part of curriculum together with series of optional elective subjects, which are complimentary to those structured in the central core.

Many of the faculty members participated in various Symposiums and Seminars.

DEPARTMENT OF COMPUTER SCIENCES & ENGINEERING

The Department of Computer Science & Engineering organised two courses on Computer usage for Polytechnic teachers, Government of Bihar under World Bank Programme during January and February 1994. The Department has been recognised by the U.G.C. as a Resource Centre for conducting computer training courses for University College teachers of Bihar.

During the period under review the following equipments have been added :

1) Tata Unisys U600/65 multi CPU system with 50 terminals

2) Digital Alpha A x P 64 bits systems with 16 terminals.

3) Parallel processing work station 2 Nos.

4) Personal Computers worth 2.4 lakhs.

The Department has already submitted a proposal for starting M.Tech (Computer) programme. The Department will be introducing an elective, Computer Aided Geometric Design in MCA in August 1994. Funds for Computers, books software have already been sanctioned for this by the U.G.C. The Department is also proposing to introduce Computer Hardware Maintenance & Repair and object oriented programming in the 7th Semester of B.E. programme.

The Department has received grants from the Ministry of Human Resource Development, Government of India for establishing Computer Aided Design laboratory. The U.G.C. has also sanctioned a project on "Development of Computer Algorithm for Stiff Differential Equation" to Dr.P.K. Mohanty. Dr. Mohanty has also been invited to join the Editorial Board of Journal of Applied Sciences and Computation, an International Journal published by Pergamon Press, USA.

Many of the faculty members participated in seminar conducted at IGNOU and at Calcutta.

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Theoretical Modelling and simulation of Solid State devices for high speed and optoelectronic applications have been an active area of research in the Department. The project "Computer Simulation of Heterojunction Solid-State Photodetectors for Fibreoptic Communication Systems" sponsored by the Department of Science & Technology, Government of India has been completed. During the year under report, a number of novel solid-state source detectors structures for integrated optoelectronics applications have been introduced. These include Double-Heterostructure InAs/InAs Sb Light emitting - Diode for application in 2m to 6m wave-length region High Electron - Mobility - Phototransistor and Photo-MISFET. Further, a number of compact Computer programmes using Fortran-77 and Turbo-Pascal for simulating the devices on IBM PC (XT/AT) have also been developed. The Research Project entitled "Development of Optical Fibre Communication System for Underground Mines" is near completion. Very soon a demonstration of the system will be given in the underground mines. The work on the Picturephones using optical fibres is also in progress. Research work is in progress in the area of Fibre gas sensors. Development of CO_2, NO_2 and CH_4 gas monitoring system using optical fibre sensors for environmental pollution is in progress. Development of Laser security systems for defence applications is also going on. The Department has upgraded its optical fibre communication laboratory by adding a Monochromator, Video links, Data links, Wavelength division, Multiplexers and demultiplexers (0.5mW to 25mW) and optical powermeters. The Department has added a new laboratory Digital Image Processing and Voice Synthesis laboratory by adding DIP station with TMS 30420 video graphic processor CCD camera, Mediator and CD ROM etc. New courses on Digital Image Processing, Speech Synthesis, Microelectronic Engineering, Mobile Communication, Telecommunication Switching Circuits have been introduced at Under-graduate and Post-graduate level.

The Department conducted a training programme in Instrumentation Laboratory from March 7 - 21, 1994 for the staff of Polytechnic Colleges of Bihar.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

During the year under review the following industrial projects were completed :

1. A tinplate monitoring gamma ray thickness gauge with comprehensive limit controls was delivered to M/s Tinplate Company. The circuit and design will be patented. A similar unit, but without any upper and lower limit controlls is working very well on the shop floor for the past two years.

2. For monitoring in real time the percentage iron content in sponge iron output, an electronic system interface was designed and tested with a personal computer as the data processing unit. This system measures percentage iron content within a few milliseconds, as against any chemical method which takes several hours to estimate.

The new projects which have been taken up include:

1. A project on implementing the entire Electronic and Control System for a Mobile Transfer Vehicle sponsored by MECON. This Mobile Transfer Vehicle is controlled by a personal computer. For the first time, a special control system device - the HCTL 1100 real time control system processor has been used in this system. The system is programmable and the drive is an electro-hydraulic system operating at 1500 psi.

Most of the subsystems have been tested, and the mechanical details of the vehicle is being built through MECON. This vehicle can be programmed to follow a predefined path through the shop floor, transfering production component from operator without human intervention.

2. A miniature pressure transducer of a noval design has been tested for use in -

   (a) Measurement of intravenous blood pressure

   (b) Pressure in a supersonic wind tunnel

   The transducer is of 2 mm x 3 mm size currently and can measure pressure fast to an accuracy of 1%. Efforts are being made for further miniaturising the device to less than 1.5 mm x 1.5 mm. The device can be mounted in the stem of a hypodermic needle for direct on line pressure measurement during surgeries. The unit has a dynamic response of 5000 Hz. This unit will find application in pressure measurement at a point occupying an area less than 0.5 sq mm under dynamic conditions.

3. Neural network applications were applied to pattern identification. The pattern identified are all the written english alphabets. The neural network approach gives precise identification of alphabets. This is a new approach which will find application in industrial pattern recognition and identification systems.

Following Post-graduate thesis were completed :

1) A Study and Simulation of back-propagation and Kohonen Neural Networks and Realization of a SCWTA circuits.

2) On Line Handwritten Digit Recognition by simulated multi-layer perceptron (MLP).

3) Flatness control of cold steel rolling mill using neural network.

On the basis of a tactile - sense system designed and implemented with analysis, a robotic Tactile sensor resulted in a Ph.D. dessertation. This desertation was approved for the award of a Ph.D. in Robotics.

DEPARTMENT OF INFORMATION SCIENCES (LIBRARY)

The Department of Information Sciences was started in the month of july 1993 with an object to impart up-to-date knowledge and technologies in the field of information science to meet the ever growing demand of information seekers with a special reference to developing countries.

The Department has established an Information Technology laboratory in which equipments like PC's, XT, AT, E-Mail, Fax and Microfische/Microfilm Reader-cum-Printer, On line information Retrieval through DIALOG have been installed. The facilities at R&D SAIL Information Centre and DTP facilities at BIT-STEP are also being used by the students.

During the year under review, the Department organised XIX All India IASLIC Conference from Dec. 26 - 29, 1993. The theme of the Conference was "Collection Development in the context of Economic Recession". More than 200 participants from all over the country attended the Conference.

DEPARTMENT OF MANAGEMENT

Under the joint programme of B.I.T. and Institute of Chartered Financial Analysts of India (ICFAI), the Department of Management has been entrusted the task of support and contact classes for B.E.-D.B.F. and M.B.A.-C.F.A. joint programmes.

During the period under review, Mr. Sushash Sarnikar, Executive Director, ICFAI, Hyderabad gave a talk on "Emerging Careers in Business and Finance".

The Department conducted a correspondence course for Graduate Non-Executives (Non-technical) employees of MECON in April 1994.

The faculty members of the Department, namely Prof. Awadh Prasad, Dr. Amar Nath Jha and Dr. Manju Bhagat organised seminars at Sambal University and MDI, Bilaspur.

DEPARTMENT OF MECHANICAL ENGINEERING

The Department of Mechanical Engineering has various laboratories, some of which are conventional for Undergraduate teaching and some specially meant for Postgraduate and research students, are being constantly upgraded. The emphasis is more on the upgradation of Solar and other Non-conventional Energy Sources Lab., CAD Lab., Advanced S.M. Lab and Power Engineering Lab. In these laboratories number of modern equipment have been added and modern measurement techniques have been adopted. Many projects at the Undergraduate and Postgraduate level have ben completed and many are in progress.

On the Non-conventional energy side the Department is trying to develop such models that would make the power available to the rural areas. Development of Solar Lantern, improved Solar Cooker, Solar Pond technology and improved Bio-Gas Plants are some of the areas on which the efforts are largely being concentrated.

In the field of power engineering, work on Fuel-Efficient I.C. Engines, Stratified Charge Engines and Low Heat Rejection Engines is continueing. Research work is also being done on engines running with hydrogen with emphasis on prevention of environmental pollution.

Another area of major interest is of Computer-Aided Design. The Department has a well equipped CAD Lab. Both Undergraduate and Postgraduate students are making extensive use of this Lab. It is proposed to augment this laboratory for further work of more advanced nature like expert systems, Computer graphics, Automatic mesh generation and adaptive control.

DEPARTMENT OF PHARMACEUTICAL SCIENCES

Work in the various fields of pharmacy, namely pharmaceutics, potential synthetic medicinals, phyto-chemistry and pharmacological studies of synthetic medicinals and phytochemicals is being carried out in the Department.

At present there are two UGC Sponsored schemes running in the Department. Work on HRD Scheme - an Integrated Approach towards pollution control and Energy conservation through Spirulina cultivation is in progress.

In the field of Pharmaceutics, stability studies involving influence of formulation factors on the stability of Vitamin C in vanishing creams has been systematically evaluated. These studies have led to some interesting results. Further work in this area is in progress. Effect of crystal habits on the formulation of suspension - a UGC sponsored research project is in progress. Sustained release dosage form is another area in which the work is going on. Controlled release formulations of theophylline - a bronchodilator using eudragit RLPO & RSPO polymers have been formulated. Both In-vitro as well as In-vivo evaluations of these formulations have shown promising results.

One of the problems faced in hospitals is that of clinical monitoring of blood levels of drugs. Efforts to develop simpler methods for such clinical monitoring are in progress. It has been found that salivary concentration

of sulphamethoxazole is a good index of blood levels of this antimicrobial agents.

Studies on dissolution-dialysis technique as an In-vitro method for monitoring the bioavailability of dosage forms are continuing. Excellent results have been obtained with analgin, paracetamol, phenylbutazone and ibuprofen tablet formulations. Further studies on drugs of different physico-chemical characteristics are being carried out in order to ascertain the universality of this method.

In the area of phytochemistry, studies on various medicinal plants are going on. The stress at present is on plants which are reported to be immunomodulators. Further, effect of various hormones and plant growth substances on the phytoconstituents of various medicinal plants are also underway.

Studies on synthetic analogs of Indanes, azabicyclanes and peptide drugs are in progress. Number of analogs of these moieties have been synthesized. The pharmacological activities of these compounds are yet to be assessed.

The Department has also been involved in setting up of a Central Testing Laboratory at Nigeria. Dr.A.K. Sharma, Professor in the Department was deputed for this work.

DEPARTMENT OF PRODUCTION ENGINEERING

The Department of Production Engineering is actively engaged in research in the following areas:

1) Ergonomics of System/Work Station Design,
2) Skill based Flexible Automation,
3) Forging of Sintered Preforms,
4) Petri-Net Modelling of FMS, and
5) Manufacturing Tribology.

The Department conducted a 3-month Entrepreneurship Development Programme for teachers of Polytechnic of Bihar.

Dr. Surendra Kumar and Prof. A.K. Jha have written a book entitled "Technology of Computer Aided Design and Manufacturing (CAD/CAM)".

DEPARTMENT OF SPACE ENGINEERING & ROCKETRY

The Department has completed the following sponsored projects:

1. A Study of Pressure Dependence of Burning Rate of HTPB-AP Composite Solid Propellants sponsored by ISRO, and
2. Experimental Studies on Elastic Buckling of Composite Plates sponsored by Defence AR & DB.

The work on the following projects is in progress:

1. Development Studies on Gelled Monomethyl hydrazine (MMH) Propellant sponsored by ISRO,
2. Experimental Studies on Fatigue of Carbon Fibre Reinforced Composites under Adverse Environmental Conditions, sponsored by Defence AR & DB, and
3. Experimental Studies on Elastic Buckling of Glass/ Epoxy Composite Plates under Thermal Loading, sponsored by HRD.

Research in various areas of Aerodynamics and Propellants & Rocket Propulsion is in progress and following results have been achieved:

AERODYNAMICS

Computational and Experimental Studies of Boundary Layer Flow over a Flat Plate :

An attempt has been made to study the flow field parameters on a long flat plate at a nominal velocity of 34m/sec. The study has been carried out to obtain the extent of leading edge separation, laminar separation and surface turbulence characteristics. From the surface pressure distribution, the point of separation has also been estimated and compared with the results obtained by the method of tufts.

A computational programme based on Cebeci and Keller Box method has been incorporated to obtain the solution of Navier-Stokes equations and Boundary-Layer flow parameters.

Use of Vortex Lattice Method for the Computation of Aerodynamic Characteristics of Wings with Thin Sections and Having Sweepback :

An attempt has been made to obtain computationally the finite wing properties like sectional circulation distribution, sectional lift coefficients and overall induced drag and lift coefficients over a wide range of angles of attack (2 degrees to 20 degrees at an interval of 2 degrees) and aspect ratios (from 1.5 to 2.0 at an interval of 0.25). The computational results obtained indicate the necessity of employing a certain minimum number of panels for steady computational results. The results obtained in the present case agree well with the experimental values and computational results obtained by other researchers using different computational techniques.

Study of Unsteady Pressure on Expansion Surface in Supersonic Flow :

An experimental investigation has been made to study the unsteady behaviour of the flow due to interaction between a shock wave and boundary layer on plano-convex

(expansion) surface model, of three different thickness - 5 mm, 7mm and 8 mm in a supersonic wind tunnel at flow Mach number 2.25 and unit Reynolds number range from 11.52×10^6 to 18.74×10^6. The pressure distribution on expansion surface, for steady and unsteady cases, the intensity of turbulence, Reynolds longitudinal normal stress, the length of separation, pressure rise and the effect of expansion of flow were the main objectives of the present investigation. The separation length and flow reattachment have been obtained by titanium dioxide-oil, flow trace technique and Schlieren photography.

Computation of Wing Aerodynamic Characteristics Using Low Order Panel Method :

An attempt has been made to develop a computer programme to obtain the aerodynamic parameters like pressure distributions, lift coefficient and spanwise load distributions. The method is based on piecewise constant doublet and source singularities strengths. Calculations are compared with higher-order solutions due to Rubbert for some cases. It is shown that for comparable density of control points where the boundary conditions are satisfied, low order solutions give comparable accuracy to the higher-order-solutions. The programme developed in the present work is self explanatory and can be readily adopted to a variety of problems without much tailoring.

It may be reported that a mechanical instrument has been designed and validated to measure unsteady flow features at high speed.

PROPELLANT AND ROCKET PROPULSION DIVISION

Studies on HTPB-AP Composite Solid Propellants :

The experimental studies have been carried out under an ISRO Project to measure the burning rates of HTPB-AP

Composite solid propellants, both at high pressures (1KSC to 110 KSC) and Subatmospheric pressures (1KPa to 92 KPa). The effect of oxidizer loading, aluminium metal powder addition and the role of Boron, Ferrocence and n-butyl ferrocence on the burning behaviour of these propellants has been investigated. The results reveal that the burning rate increases with the increase of oxidizer loading.

It is inferred from the studies that the incorporation of Boron in the aluminized propellant increases the burning rate at all pressures more or less equally. The burning rate increases at a faster rate with the increase of Boron concentration if it is less than 0.5 percent. The addition of ferrocene and n-butyl ferrocene aluminized propellants improves the burning rates at all pressures. The heat of combustion of propellants also increases with these additives.

Effect of Preheated Ammonium Perchlorate on the Burning Behaviour of PVC-AP Composite Solid Propellants

The use of preheated AP and (AP + Fe_2O_3) of a suitable particle distribution has been found very effective in increasing the high pressure and decreasing the low (subatmospheric) pressure burn rates of PVC based composite solid propellants. The burning rate increases by nearly 40% and 12% in the pressure range of 3000-5000 KPa over that containing untreated AP, when preheated (AP+Fe_2O_3)and AP respectively of same particle size distribution and in same proportions are used in propellant formulations. In the subatmospheric region (50-70 KPa), however, the burning rate decreases nearly by 7% in both cases.

Rheological Characterization of Poly (vinyl chloride) Plastisols

The rheological studies of PVC dispersed in DBP have been carried out in the light of the importance inherited by this system from industrial and propulsion view point. The dispersion range covered under the study is 0-50 wt. % at an increment of 10 wt %.

The apparent viscosity of plastisols is found to increase linearly upto 40 wt % of PVC dispersed in DBP. Beyond this concentration, the apparent viscosity increases abruptly. The system is found to behave as pseudoplastic and dilatant in the 0.3 -10 rpm range and 10 -60 rpm range respectively. The aging of plastisol also is found to increase the viscosity. Thixotrpic character is noticed only in 0.3 -10 rpm range.

Further studies are in progress to have more deeper understanding of rheological behaviour of this system.

Studies on the Metallized Gelled Propellants :

The Department has been the first to start the work on the development of gelled propellants in the country. A noval approach has been used to develop metallized liquid fuels suitable for applicatiion in liquid rocket motors. Liquid fuels with metal powders have been developed by modifying the parent liquid carrier into a more viscous gel by addition of suitable gelling agents and then suspending the finely divided metal powders like aluminium and magnesium in the bulk. An intensive study for the search of suitable particulate and chemical gelling agents for storable liquid propellants like hydrazine, monomethyl hydrazine (MMH), UDMH, aromatic amines and RFNA has been carried out. The gellation processes, mechanism of gellation and combustion studies of these gelled systems have been investigated.

Currently, the work on the gellation of MMH liquid rocket fuel under an ISRO sponsored project is in progress. Suitable techniques for transferring the MMH gel have been developed.

Thermal Degradation Studies of Propellant Ingredients :

The themal degradation studies of propellant ingredients, polymers and high energy materials are being carried out with the help of recently procured high pressure

Differential Scanning Calorimeter (DSC). These results would throw light on the intricate combustion mechanisum of propellants and their constituents.

Studies on Performance Parameters of PVC-AP Composite Solid Propellants Incorporating Aluminium Metal Powder

The research work has been carried out to determine the thermodynamic properties of the working substance and the performance parameters theoretically for PVC-AP Composite solid propellants, incorporating Aluminium metal powder upto 10 percent loading by computing the flame temperature and equilibrium composition of the combustion products with frozen flow consideration. All computations have been carried out at three different combustion chamber pressures, namely 70 KSC, 60 KSC and that actually obtained during static test firing for each of the propellant composition, from which pressure-time and thrust-time histories have been obtained to find out the various important performance parameters. The experimental and the theoretical values have been compared to ascertain qualitatively the role of Aluminium metal powder on the combustion of PVC-AP composite solid propellants and the performance of the rocket engine.

Composite Materials

The research work has been done to study the effect of various parameters viz. fibre orientation, fibre volume fraction, aspect ratio and thickness on buckling load of composite plates. The buckling behaviour in the presence of cut-outs has also been investigated. The experimental work was limited to E-glass/epoxy composites at room temperature.

Irrespective of boundary condition and fibre orientation, theoretical buckling load calculated using classical

laminate theory is always greater than experimental buckling load by an average of 10 percent.

The Experimental Studies on Fatigue of Carbon Fibre Reinforced Composites Under Adverse Environmental Conditions is in progress.

Dr. A.K. Shrivastava attended a "National Seminar on Composite Materials" held at Indira Gandhi Institute of Technology, Sarang (Orissa) and presented a paper entitled "Effect of Fibre Orientation on the Fatigue Behaviour of Glass Fibre - Epoxy Composites".

DEPARTMENT OF APPLIED CHEMISTRY

In addition to Under-graduate teaching, the faculty of the Department is engaged in consultancy and Material Testing namely Soil & Water testing of samples from Government and Semi-Government Organisations.

During the year under review, the Department conducted a training programme for Laboratory Technicians of Bihar Polytechnics.

New instruments namely - Thermal Analyser, Auto-titrator and Electronic Balance have been procured and installed in the Department.

DEPARTMENT OF APPLIED MATHEMATICS

The Faculty members are actively engaged in research work in the following areas:

1) Environmental pollution studies,
2) Information/expert system in health management,
3) Boundary Layer Theory,
4) Plasma Physics, and
5) Elasto dynamics with special emphasis on seismology.

In environmental studies, mathematical models have been developed to investigate the dispersion of air pollutants in the atmosphere as well as on the ground. The pollutants which are toxic in nature are emitted from different types of sourcessuch as point sources, line sources and area sources. These models are capable of quantitative prediction of the level of pollutants downwind from the source.

The study is made essentially in the Planetary Boundary Layer (PBL). The meteorological parameters such as wind speed,plume rise and eddy diffusivity and the topographical parameters such as ground roughness, uneven terrain are included in the model. As the theoretical basis is not always available to estimate above parameters,an empirical or semi-empirical approach has successfully been adopted and the merit of the results in this approach is significant.

There are three approaches in mathematical modelling: (i) Numerical, (ii) Analytical and (iii) Gaussian. Amongst these three, the thid one, that is, Gaussian model is useful from the point of view of practical applications as it is very easy in implementation. Numerical models which need computer of high speed and huge memory are not feasible for consultancy, but it gives clear picture of the diffusion process while analytical models give elementary results. Studies have been conducted in all these directions with a view to understanding the process in wide spectrum.

Results so far obtained are encouraging from practical point of view and are applied in consultancy job with MECON, Ranchi, yielding satisfactory results.

In the area of Information/expert system in health management, efforts are in progress in developing complete indigeneous information system and expert system. Some progress has been in this direction. Writing software is completed and the same has been tested with the help of data collected from some hospitals.

In Boundary Layer Theory, a significant progress has been made in solving boundary layer problems based on mixing length theory. Efforts are now in progress to extend the theory to atmospheric boundary layer theory.

Besides, a good deal of research work on elasticity, plasticity, anisotropic or partly anisotropic elestic bodies, micropolar elasticity, plane MFD flows, rotating MFD flows and hydromagnetic non-Newtonian fluids flows has been carried out in the Department.

The results of findings of the above topics are either published in national/international journals or presented in the seminars/conferences/symposiums of international repute.

Future Plans and Programmes :

It is planned to take up research in the areas which are relevant to the present scenario of national interest and include :

(1) Weather forecasting

(2) Coastal meteorology

(3) Oceanography

The work will be carried out in collaboration with other relevant Organisations in the country.

DEPARTMENT OF APPLIED PHYSICS

During the period under review the following instruments have been added to the Department:

1) Mosebour Spectrometer
2) Atomic Abserption Spectrophotometer
3) Laser Holographic Instrument.

Work on the project "Study of Arc Plasma Characteristics of Cascaded Arc Plasma Generator",sponsored by Department

of Science and Technology, Government of Bihar is under progress. The research project entitled "Metallic Multilayer Surface Coating using Anodic Vacuum Arc" submitted by Dr. P. K. Barhai to ISRO has been recommended by USSC, Trivandrum for funding under RESPOND programme.

PARTICIPATION OF FACULTY IN NATIONAL AND INTERNATIONAL CONFERENCES/SEMINARS

DEPARTMENT OF CIVIL ENGINEERING

1. Rajeevalochanam, B.S. delivered a lecture on "An Investigation into Potential yield and Ground Water pumpage of water aquifer system", Symposium held by Bihar Engineering Service Association, Ranchi, Aug. 1993.

2. Rajeevlochanam, B.S. delivered a lecture on "Rural Small Scale Hydropower Projects - an imperative Alternative to Chronic Power starved Bihar Plateau", National Seminar, CIVSEM 93, Coimbatore, Nov. 1993.

3. Rajeevlochanam, B.S. delivered a lecture on "Causes of failure of Check Dams in the Hilly tracts of South Bihar Plateau and its Remedial Measure", National Symposium on "Recent Trends in Design of Hydraulic Structures", Roorkee, March 1994.

4. Singh, B.K. delivered lecture on "Effect of Fibre Orientation on the Fatigue Response of Glass/Epoxy Composite", National Seminar on Composite Materials, Indira Gandhi Institute of Technology, Sarang (Orissa), March 1994.

5. Pathak, G. and Jha, J. delivered lecture on "Sustainable Development : A Challange for Cities", Seminar on 'Environmental Challanges and Universities', Association of Indian Universities, New Delhi, 1994.

6. Pathak, G. and Jha, J. delivered a lecture on "Small and Micro Hydel Power Plants", International Conference on 'Shaping the future by Law : Children, Environment and Human Health', New Delhi, March 1994.

7. Pathak, G. delivered a lecture on "An approach to Educating Engineers in Occupational Safety and Health with reference to Developing Countries", FUTURESAFE 94

organised by National Safety Council of Australia, Sydney, Australia, May 1994.

8. Pathak, G. and Jha, J. delivered a lecture on "Coalfield Fires : A serious threat to Community and Environment", 3rd International Conference on Safe Communities, Oslo, Norway, June 1994.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

1. Sharma, A. attended a course on "Computer Aided Geometric Design", IGNOU, New Delhi, May 1994.

2. Mukherjee, I. participated in 7th International ULSI Design Conference, NEC - USA, Calcutta, Jan. 1994.

DEPARTMENT OF MANAGEMENT

1. Prakash, N. attended Faculty Development Programme organised by I.C.F.A.I., Hyderabad, June 1994.

2. Sharan, S. delivered a lecture on "Integrated Conceptional Framework for Project Management : A case of Bihar Plateau Development Project", National Seminar on Project Management, ISM, Dhanbad, Feb. 1994.

DEPARTMENT OF PHARMACEUTICAL SCIENCES

1. Sasmal, D. delivered a lecture on "Environmental Toxicology" in Summer School on 'Present Scenario of Ecology and Environment Pollution : Assessment and Control', I.S.T.E., B.I.T., Mesra, Ranchi, May 1994.

2. Mukherjee, M. delivered a lecture on "Industrial Effluent Treatment and Solid Waste Management" in Summer School on 'Present Scenario of Ecology and Environment Pollution: Assessment and Control', I.S.T.E., B.I.T., Mesra, Ranchi, May 1994.

3. Mukherjee, M. attended short term course, sponsored by DIP on "Polymer blends and alloys", I.I.T., Kharagpur, June 1994.

4. Mukherjee, M. delivered a lecture on "Recent Developments in Drinking Water Purification Processes" in UNICEF sponsored course for PHED Engineers of Bihar, Dec. 1993.

5. Mukherjee, M. delivered a lecture on "Liquid Effluent Treatment & Solid Waste Management" in EDP-1994 for teachers of Polytechnic of Bihar, May 1994.

6. Basu, S.P. delivered Inaugural Address at "7th Advanced Course on Air Conditioning and Ventilation Engineering", Calcutta, Sept. 1993.

7. Basu, S.P. delivered lecture on "Anticonvulsant Drugs", Summer School, Ranchi Veternary College, Ranchi, Nov.1993.

8. Basu, S.P. delivered lecture on "Industrial Pollution and their Detection usuing Instruments", International Symposium on Instrumentation & Control of Environmental Pollution, Calcutta, January 1994.

9. Razdan, B.K. delivered lecture on "Drug Design", Summer School, Ranchi Veternary College, Ranchi, Nov. 1993.

10. Basu, S.P. et. al, presented a paper entitled "Total Synthesis of Pongamol", 44th I.P.C.A. Congress, Bangalore, January 1993.

11. Basu, S.P. et. al, presented a paper entitled "Anti-convulsant effect of Pongomol", 45th I.P.C.A. Congress, New Delhi, Dec. 1993.

DEPARTMENT OF PRODUCTION ENGINEERING

1. Verma, A. attended Convention of Institution of Engineers (I), Allahabad, July, 1993.

DEPARTMENT OF SPACE ENGINEERING & ROCKETRY

1. Chatterjee, A.K. participated in Summer School on "Present Scenario of Ecology and Environmental Pollution : Assessment and Control", ISTE, B.I.T., Mesra, Ranchi, May 1994.

2. Shrivastava, A.K. delivered a lecture on "Effect of Fibre Orientation on the Fatigue Behaviour of Glass Fibre - Epoxy Composites", National Seminar on 'Composite Materials', Indira Gandhi Institute of Technology, Sarang (Orissa), March 1994.

DEPARTMENT OF APPLIED MATHEMATICS

1. Varshney, B.G. delivered lecture on "Research Methodology" in Orientation Programme organised by L.N.Mishra Institute of Business Management, Muzaffarpur, April, 1994.

2. Mishra, B.B. chaired "Mathematics Education Cell" of Bihar Mathematical Society, Ranchi University, Dec.1993.

3. Mahanti, N.C. delivered lecture on "Numerical Solution of Atmospheric Diffusion Equation" under UGC-DSA Programme, Jadavpur University, Sept. 1993.

4. Mahanti, N.C. delivered lecture on "Computer Applications of Hospital Management", under UGC-DSA Programme, Jadavpur University, Sept. 1993.

5. Mahanti, N.C. delivered lecture on "Computer Awareness", Bagalpur University, Dec. 1993.

6. Mahanti, N.C. delivered lecture on "Air Quality Models", Summer School sponsored by I.S.T.E., B.I.T., Mesra,Ranchi, May 1994.

7. Mahanti, N.C. and Dey, S. delivered lecture on "Unsteady Atmospheric Diffusion" in ISTAM Conference, I.I.T., Kharagpur, Dec. 1993.

8. Mahanti, N.C. delivered lecture on "Numerical Model of Air Pollution Problem due to Elevated Line Source", National Seminar on Recent Developments in Mathematics, Karnataka University, Dharwar, Dec. 1993.

9. Mahanti, N.C. delivered lecture on "Mathematical Models of Parameters affecting Atmospheric Diffusion", National Seminar on Mathematical Modelling, Jadavpur University, Calcutta, March 1994.

10. Mahanti, N.C. in National Conferene on Data Communication, Computer Society of India, Patna Chapter, April 1994.

11. Prasad, S.C. delivered lecture on "Unconventional Metal Deformations", 7th Conference of Bihar Mathematical Society, NIFFT, Ranchi, Feb. 1994.

12. Gupta, R.C. delivered lecture on "Vedic Mathematics", 7th Conference of Bihar Mathematical Society, Ranchi University, Ranchi, Feb. 1994.

13. Gupta, R.C. delivered lecture on "Infinite Roots of Equalium $X^2 = X^{11}$ ", 7th Conference of Bihar Mathematical Society, Ranchi University, Ranchi, Feb. 1994.

14. Gupta, R.C. delivered Presidential address to 28th Annual Conference of Association of Mathematics Teachers of India, Trivandram, Feb. 1994.

DEPARTMENT OF APPLIED PHYSICS

1. Barhai, P.K. attended Q.I.P. in "Lasers and their Applications", sponsored by Ministry of Education & Welfare at I.I.Sc., Bangalore, April 1994.
2. Jain, A (Mrs) attended 4th SERC School on "Radio Frequency Heating and Current Drive", Saha Institute of Nuclear Physics, Calcutta.
3. Popli, R.K. delivered a lecture on "Indian Traditional Table of Alphabets : Possible Application in Computer Simulation of Speech", Congress on Traditional Science & Technologies of India", I.I.T., Bombay, Nov. 1993.

RESEARCH PAPERS AND BOOKS PUBLISHED
(1993 - 1994)

DEPARTMENT OF CIVIL ENGINEERING

Research Papers :

1. Rajeevlochanam B.S., "An Investigation into potential yield and Ground Water Pumpage of Well Aquifer System", Proceedings of the Symposium, Bihar Engineering Service Association, Ranchi, August 1993.

2. Rajeevlochanam B.S., "Rural Small Scale Hydropower Projects - An imperative alternative to Chronic Power Starved Bihar Plateau", Proceedings of National Seminar, CIVSEM 93, Coimbatore, Nov. 1993.

3. Rajeevlochanam B.S., "Causes of failure of Check Dams in the Hilly Tracts of South Bihar Plateau and its remedial measure", Proceedings of National Symposium, Recent Trends in Design of Hydraulic Structures, Roorkee, March 1994.

4. Singh B.K., "Effect of Fibre Orientation on the fatigue response of Glass/Epoxy Composite", Proceedings of National Seminar on Composite Materials, Indira Gandhi Institute of Technology, Sarang (Orissa), March 1994.

5. Pathak G. and Jha J., "Sustainable Development : A Challenge for Cities", in Environmental Challenges and the Universities, Association of Indian Universities, New Delhi, 1994.

6. Pathak G. and Jha J., "Small and Micro Hydel Power Plants", Proceedings of International Conference on Shaping the Future by Law : Children, Environment, and Human Health, New Delhi, March 1994.

7. Pathak G., "An Approach to Educating Engineers in Occupational Safety and Health with reference to Developing Countries", Proceedings of FUTURESAFE 94, National Safety Council of Australia, Sydney, Australia, May 1994.

8. Pathak G. and Jha J., "Coalfield Fines : A Serious threat to Community and the Environment", Proceedings of 3rd International Conference on Safe Communities, Oslo, Norway, June 1994.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Research Papers :

1. Mahanti P.K. et. al, "Development of an Information Abstraction System to execute Maintenance Task", accepted for publication in Adv. in Modelling and Analysis.

2. Mahanti P.K. and Mukherjee I., "Design Methodologies for B.I.T.'s Distributed Computer Resource System", accepted for publication in Adv. in Modelling and Analysis.

3. Jana P.K. et. al, "Fast Parallel Algorithm for Polynominal Interpolation", Accepted the publication in Computers & Mathematics.

4. Sahoo G., "Some Higher Order AILMN for Non-Stiff Problems", Indian J. Math. Physics, 27, 15 (1993).

Books :

5. Mahanti P.K., Sahoo L., and Mukherjee I., "Introduction to Computers", Accepted to be published for AMIE Courses, Institute of Engineers, 1994.

DEPARTMENT OF MANAGEMENT

Research Papers :

1. Sharan S., "Developing an Expert System for Portfolio Management", Proceedings of 4th International Computering Congress, December 1993.

DEPARTMENT OF PHARMACEUTICAL SCIENCES

Research Papers :

1. Sinha B.N., Ravishankar S., and Sukumar E., "Pharmacological Studies on Corallocarpur epigaens tubers", Fitoterpia, 2, 171 (1993).

2. Roy N.K., Acharjee D.K., and Mukherjee M., "Leaching of Roasted Zinc Ore in Rotating Disc Contractor", Indian Chemical Engineer (in press).

3. Jha S., Sinha B.N., and Singh N.K., "Ethnotrotanical and Phytopharmacological Studies of N. arbortristis", Proceedings of International Conference on Phytopharmacology, Trivandrum, 1993.

4. Verma P.R.P., Keshri A., and Prasad C.M., "Chemical Standardization of Lauha Bhasma", Proceedings of 2nd International Symposium on Innovations in Pharmaceutical Sciences & Technology, Ahmedabad, 1994.

5. Sasmal D., Mandal J.K., Mahli S.S., and Basu S.P., "Anticonvulsant effects of Pongamol", Abstracts, 45th Indian Pharmaceutical Congress, New Delhi, 1993.

6. Subramanyam Ch. and Sharma A.K., "Studies on Azabicyclo Systems : Synthesis of 6-phenyl-10-methyl-3, 10-diazabicyclo (4.3.1) decane Analogs", Communicated.

7. Verma P.R.P. and Banu V., "Sustained Release of Theophylline from Endragit RLPO and RSPO Tablet", Communicated.

8. Verma P.R.P. and Meha N., "Review on Researches on Acacia Catechn", Communicated.

9. Sasmal D., Mandal J.K., Medhi N., and Basu S.P., "Anticonvulsant effects of 5-(1,3-dione-3-arylpropyl)-4-methoxy benzofuran and its derivatives", Communicated.

10. Sasmal D., "Environmental Toxicology", Proceedings of the Summer School, I.S.T.E., B.I.T., Mesra, Ranchi, May 1994.

11. Mukherjee M., "Industrial Effluent treatment and Solid Waste Management", Proceedings of the Summer School, I.S.T.E., B.I.T., Mesra, Ranchi, May 1994.

12. Mukherjee M., "Liquid Effluent treatment and Solid Waste Management", Proceedings of Entrepreneur Development Programme 1994, B.I.T., Mesra, Ranchi, May 1994.

13. Basu S.P., "Anticonvulsant Drugs I & II", Proceedings of Summer School, Ranchi Veternary College, Ranchi, Nov. 1993.

14. Razdan B., "Drug Design", Proceedings of Summer School, Ranchi Veternary College, Ranchi, November 1993.

DEPARTMENT OF PRODUCTION ENGINEERING

Research Papers :

1. Kumar S., "Simultaneous Engineering in Corporate Strategy", Proceedings of Automation and its levels in Manufacturing Industries, I.E.(I), Allahabad, July 1993.

2. Sutradhar G., Kumar S., and Jha A.K., "Production of Sintered Forged Components", Ind. J. Material Processing & Technology, 41, 143 (1994).

3. Kumar S., and Jha A.K., "Flexible Automation in Skill Based Manufacturing - A Source of Competitive Advantage", Proceedings of Congress on Traditional Sciences & Technologies of India, Bombay, December 1993.

4. Varma A., and Kumar S., "Reduction in Product Realisation Internal", Proceedings of Automation and its levels in Manufacturing Industries, I.E.(I), Allahabad, July 1994.

Books :

1. Kumar S., and Jha A.K., "Technology of Computer Aided Design and Manufacturing (CAD/CAM)," Dhanpat Rai & Sons, Delhi, 1993.

DEPARTMENT OF SPACE ENGINEERING & ROCKETRY

Research Papers :

1. Pathak P., Gupta B.L., and Verma M., "An Analytical Study of Effect of Aluminization on the Performance Parameters of RFNA - UDMH Bipropellant Systems", Proceedings of 7th National Seminar on High Energy Materials, Feb. 1994.

2. Shrivastava A.K., and Singh B.K., "Effect of Fibre Orientation on the Fatigue behaviour of Glass Fibre - Epoxy Composites", Proceedings of National Seminar on Composite Materials, Indira Gandhi Institute of Technology, Sarang (Orissa), March 1994.

3. Pal S., and Mishra J.N., "Road Vehicle Aerodynamics and effects of Bumps", Communicated.

4. Chakraborty I., Singh R.P., and Mishra J.N., "A 2D Cavity Flow Features", Communicated.

5. Jain A., and Mishra J.N., "Effects of Leading Edge Damages on the Flow Parameters of a Finite Wing", Communicated.

6. Kumar P., and Mishra J.N., "Pressure Unsteadiness and Validatiion of Mechanical Probings over Expansion Surfaces in Supersonic Flow", Communicated.

DEPARTMENT OF APPLIED CHEMISTRY

Research Papers :

1. Srivastava P.K., and Avasthi B.N., "Uncatalysed Bromate driven Oscillators : The Rhodamine B Base - Bro_3- H_2SO_4 System", Proc. Indian Acad. Sci. (Chem. Sci.), 105, 125 (1993).

DEPARTMENT OF APPLIED MATHEMATICS

Research Papers :

1. Prasad R.C., "Torsional Vibration of a Visco Elastic Circular Cylinder with special reference to Stress and Strain Rate", Communicated.

2. Prasad R.C., and Roy S., "Microstructural features of Magneto - Thermoelastic Plane Waves in a media rotating with a Uniform Angular Velocity," Communicated.

3. Prasad R.C., and Roy S., "Couple Stress Concentration around a Circular Hole in an Infinite Micropolar Thermo-elastic Plate", Communicated.

4. Roy S., "An Inverse Problem for Helmholtz's Equation involving two Semi-Infinite fluids", Communicated.

5. Roy S., and Nath G., "Non-uniform slot Injection (Suction) or wall Enthalpy into a steady non-similar compressible Laminar Boundary Layer", Acta Mechanica, 103, 45 (1994).

6. Thakur C., "An Exact Solution of Steady Plane Orthogonal MHD flows", Communicated.

7. Thakur C., "Magnetohydrostatic Equilibria with Lamellar Current Density", Communicated.

8. Gupta R.C., "The Mahavira-Fibon acci Device to reduce p/q to Unit Fractions", Historia Mathematica, 21, 231 (1994).

9. Gupta R.C., "An update Bibliography Jaina Mathematica: Research work and Publications of R.C. Gupta", Jinamanjari, 7 (2), 77 (1993).

10. Gupta R.C., "Indian Doctoral Thesis in the field of History of Mathematics", Historia Mathematica, 20 (3), 310 (1993).

11. Gupta R.C., "An Extension of Ptolemy's Theorem", HPM Newsletter, No 30, 12 (1993).

12. Gupta R.C., "Rectification of Ellipse from Mahavira to Ramanujan", Ganita Bharati, 15, 14 (1993).

13. Gupta R.C., "A Problem of Interest from Narada Purana", ibid, 67.

14. Gupta R.C., "Class-01 of Selenius (1922-1991), an Expert in Indian Cyclic Method", ibid, 74.

15. Gupta R.C., "S.N. Sen (1918-1992), a great Scholar and Writer in the field of History of Science", ibid, 79.

16. Gupta R.C., Hayashi T., and Volodarshy, A.I., "Notices of Selected Publications, N 2718 to N 3000", ibid, 103.

17. Gupta R.C., "How many were the peacocks (Hindi)", Arhat Vacana, 6, 37 (1994).

18. Gupta R.C., "Ancient Mathematical Heritage of Bihar", Souvenir '94, Ranchi University, February 1994.

19. Gupta R.C., "Ramanujan Birthday Celebrations in India", A Report, HPM Newsletter, No 31, 2 (1994).

DEPARTMENT OF APPLIED PHYSICS

Research Papers

1. Barhai P.K., and Keshri S. (Mrs.), "Thermo-electric Power of High TC Oxides with Phenomenologically Modified Hubbard Model", Communicated.

2. Popli R., Kumar V.R. and Bhowmick R.K., "Possible Four - Quasiparticle Band in 102 Ag", Communicated.

3. Popli R., "Some Errors in Reputed Undergraduate Text books - I", Communicated.

DEPARTMENT OF PHYSICAL EDUCATION AND SPORTS

Research Papers :

1. Yadav R.S., "Socio-Psychological Dimensions of Sports Performances", Proceedings of 9th National Conference on Sports Psychology, Nagarjuna University, Nagarjuna Nagar, May 1994.

SCHOLARS REGISTERED FOR Ph.D.

During the year 1993-94, two scholars have completed their research qualifying for the award of Ph.D. Seven new scholars have registered for Ph.D. Programme in the subjects/areas of their study as stated below :-

Name of Scholar	Subject/area of Research
1. Sri Rajendra Prasad	Quality System for Guideo Weapon Systems.
2. Sri Pramod Kumar Dash	Experimental Studies on Fatigue of Glass and Carbon Fibre Reinforced composites under Adverse Environmental Conditions.
3. Sri B. D. Choubey	Physio -Chemical study of co-ordinated Malonic Acid and similar Compounds.
4. Mrs. Sunita Keshri	Study of Oxide Superconductors with high transition temperatures.
5. Mrs. Aruna Jain	Study of Non-equilibrium Plasmas.
6. Sri K.R. Roy Choudhary	Buckling of Laminated Composite Plates.
7. Sri Binay Kr. Singh	Influence of Adverse Environmental Conditions on Elastic Buckling of Composite Columns.

Besides the above, the following 24 scholars were registered for their Ph.D. in the previous year(s); they are continuing the work under the guidance of the respective Doctoral Committees :-

Name of Scholars	Subject of study
1. Sri Tapesh Kumar Roy	Problems and Prospects of Marketing of Drug Manufactured by Small Scale Industries.
2. Sri Goutam Sutradhar	Development of Forged Components using Sintered Preforms.
3. Sri M. Adiraj	Synthesis and use of Methyl Phosphonate containing Oligonucleotides for the study of B - Z DNA Transition.
4. Sri Sudhir Sharan	Computer based Analysis & Modelling for Integrated Working Capital Management.
5. Sri R. S. Yadav	Impact of Physical Training on Managerial Effectiveness - a case study of some Institutions and Organisations.
6. Sri Pawan Kumar Rai	Solid Waste Management in Steel Plants for improved Environment.
7. Mrs. Runa Chakraborty	Fracto-Emission from Polymers and Polymer Composites.
8. Sri Amit Jana	Theoretical Modelling of Hetero-Junction field Effect Transistor for high speed and Opto-Electronics Applications.
9. Sri S. K. Datta	Some Theoretical studies on Optically controlled Microwave Semi-conductor Devices.
10. Sri A. K. Mishra	Some Experimental studies on Environmental Pollution due to Diesel Engine Exhaust.
11. Sri S. N. Thakur	Castability, Forge-ability, Mechinability and Fracture behaviour of Alluminium Silicon Alloys.

12.	Sri B. K. Mishra	Computer Aided Modelling of Solid-State Photodetector.
13.	Sri Durgesh Pant	A complete study of Reconfigurable Computer Systems.
14.	Sri Prasant Kumar Mukherjee	Quadratic Studs and Methods of Approximating them in Ancient and Mediaeval Mathematics.
15.	Ms. Sandhya Rani	Study of some Chemical aspects of stress induced Magnetic & Electromagnetic Effects in Transition Metals and Intermetallic Compounds.
16.	Sri Arun Kumar	Synthesis and Pharmacological studies of Indan Analogs.
17.	Sri Ch. Subramanyam	Synthesis and study of Analogs of 6-Phenylpreudopelletierine.
18.	Sri Rabindra Pd. Sharma	Modelling of the Combustion Process for a Fuel Efficient four stroke spark Ignition Engine.
19.	Sri Arbind Kumar	Investigation on Metal Hydride as carried to run the future vehicle engine on Hydrogen.
20.	Sri T. R. Ranganath	Studies on Honey Cone Stabilised Saltless Solar Pond.
21.	Sri Mihir Kumar Nanda	Ultra-short Laser Pulses and related Plasma Phenomena.
22.	Sri U. S. Prasad	Stress induced magnetic and E.M. effects in Metals.
23.	Sri Girish Pathak	Tribological investigations in Mechanical Processing.
24.	Sri Y. B. Joshi	Design of a conceptual database on Information Science approach.

STUDENTS ACTIVITIES

The session 1993-94 has proved to be a mile-stone in the history of cultural activities of the Institute. The Institute had the privilege of hosting the East Zone Inter University Drama Competition on National Integration sponsored by the Association of Indian Universities. The festival received a very encouraging response and nine universities participated in the competition. Our Institute bagged the Runner's trophy.

Currently there are more than twenty societies & clubs giving ample opportunities for personality development of studies.

Dramatic Society :

The "Stage" has been a proven and vital medium of expression. Dramatics Society provided to the students an opportunity to present serious theatre and play on one hand and a touch of humour and satire through monoact mimicry and skit.

Music Club :

Provided a platform for development of musical talents to a large number of interested students in the areas of Indian Classical Music, Western Music and Light Indian Music. It also provided opportunities to students for organising popular musical nites on the Campus during the cultural festivals. Students are also encouraged to participate in Inter-language choirs so as to create feelings of national integration in them.

The Highlander's Adventure Club :

It is an affiliate of NAF and NTMC and provides ample opportunity for the participants to derive delight from Adventure-Hitch-Hiking, Cycle Expeditions Rock Climbing or Mountaineering at no or very low cost.

Spic-Macay :

The Society for the Promotion of Indian Classical Music and Culture amongst Youth had its fair share of activities by inviting famous exponents of Indian Classical Music and Dance. During the year, among others Ms. S. Kanaka (Bharatnatyam) gave demonstration and performance in the Institute.

The Audio Visual Education Club :

While presenting recent and classic films every weekened for entertainment and relaxation of the students the Club also provided a number of technical and educational films and documentaries. The Club is very popular amongst all the residents of the Campus.

Pooja Committee :

The Committee conducts "Saraswati Pooja" and "Vishwakarma Pooja" to promote the religious sentiments of the students and staff.

The Engineering Society:

In the technical and scientific arena, the Engineering Society promotes the interest of the students in the design, development and complete fabrication

of working engineering models. The society organised a number of technical talks by eminent scientists and engineers.

It is note-worthy that the various engineering faculties with their concentrated extra curricular efforts have been encouraging fraternity and identity, through the societies/Clubs in their respective areas e.g. Electrical and Communications Engineering Society, Computer Engineering Society, Civil Engg. Society and Pharmaceutical Society etc. The students' chapter of the Institution of Electrical and Electronics Engineers (India) are also engaged in a variety of technical persuits.

The Amateur Radio Society :

It has a membership of over hundred students; students are able to reach out all-over the world through intricate communication net work under the Radio-HAM Society.

The Indian Association of College Going Scientists :

The activities of this Society include organising Technical trips to industrial areas, Seminars, technical quizzes, apart from initiating astronomical observations.

The News and Publication Society :

The Society provides an opportunity for news reporting, Journalism and creative writing. It brings out the latest news in the regular issues of "Campus Times", "Sports Times" and in quarterly issues of the BIT by BIT.

Unesco Club :

Under the auspicious of the Unesco Club the students participated in serious debates and quizzing. Interesting events like 'Just-a-Minute' 'Block and Tackle' etc. were also organised by the club.

The Bhartiya Sahitya Parishad :

It is a forum for promoting cultural activities in the national language. The Parishad organised Kavi Sammelans, Mushaira, Folk Dances Creative Writing and Publications contests.

Photographic Society :

Expression and creativity through synthesis of ideas and color through a camera or a canvas is an accepted truth and enjoyable pastime. Photographic Society provided ample opportunity to students interested in Camera or Darkroom/Studio work. During the year the Society had over 200 members. There are two Dark-rooms with full facility for Printing of films in the Institute, and also in the residential Halls.

The Fine Arts Society :

Looked after the generation of skills in using pencil, pastel, water and oil colors paints as well as sculpture and handicrafts.

Bitian's Nature Club :

It is an affiliate of the World Wide Fund for Nature and has encouraged students participation to know and love, respond to and vibrate with the Nature in all the immensity and totality.

Other Voluntary Clubs :

The BIT chapter of Leo Club and Rotract Club have a record of creditable performances. During the year 1993-94 they arranged a couple of Health Camps, Blood Donation Camps, with the support of the eminent Doctors of the town. Moreover, visits to rural areas for identification of their problems, adult education camps and such other social service activities were also organised by these Voluntary Clubs.

GAMES AND SPORTS

Since inception, the Institute has placed emphasis on Games and Sports. Earlier this activity was organised as a co-curricular Programme but from 1984 the Games and Sports has been provided in the regular curriculum of the Under-graduate Course by treating it as a full course in the 1st and 2nd Semester of the B.E. and B. Pharm. Degree programme. Accordingly, the students are exposed to P.T. & Drill, Gymnastics etc. thrice a week and on the other days they are required to play the allotted Games. Suitable arrangement for training and participation of girl students has also been made and their participation in P.T. & Games is compulsory. Now-a-days, on an average over 50 percent of the students take part in the Games, Sports and Athletics on a regular basis.

This year, the Institute organised All India Inter-University Weight Lifting & Best Physique Championship(M) 1994 sponsored by Association of Indian Universities. This national event was held in the state of Bihar for the first time since inception of the Inter-University Weight Lifting & Best Physique Competitions. Fiftynine Universities participated in this Meet. The Institute received assistance from qualified officials of National and International level for conducting the Competitions which was conducted in a very graceful manner in Auditorium of the B.I.T., Mesra.

The Institute's team participated in the above National Competition and one of our Athletes Mr. Rajesh Mukherjee won silver Medal in Best Physique event of Weight over 90 Kg. Category.

Tennis team of the Institute participated in North East Zone Inter University Tennis Tournament (M) 1993-94 organised at Punjab University, Chandigarh.

Other than above events usual Intramural Tournaments, Annual Sports Meet were organised and students participated enthusiastically.

The Chetan Devaraj Memorial Inter Technical Institutions (East Zone) Cricket Tournament 1993-94 was organised in November 1993. Allahabad Agricultural Institute won the cup and B.I.T., Mesra was runner-up.

N.S.S. :

The number of active members has been increased to 98 including some students of higher semesters and Post-graudate programmes who joined the NSS voluntarily.

Night classes for the mess-boys were organised for different hostels. Books and stationery were distributed free of cost. Special medical camp was organised in which free medicines were also made available to the needy persons.

A Seminar on " Aids Awareness " was organised on August 8, 1993 to generate awareness among the volunteers and neighbouring areas. In this Seminar a team of specialist Doctors from Ranchi Town and R.M.C.H., Ranchi, had participated.

N.C.C.:

A unit of the National Cadet Corps was set up in the Institute in 1957 for imparting technical as well as general training to the students. Initially, it functioned as an EME Sec. with a strength of 60 cadets. The

seventies have been a period of serious student unrest all over the State and consequently the NCC programme also suffered to a considerable extent. However, there was some revival in the early eightees . In order to encourage students' active participation in this programme in 1984 the Institute provided it in the regular curriculum with a weightage of '2 unit' equivalent to two courses of 100 marks each, in the 1st and 2nd Semester of the Undergraduate B.E./B.Pharm. Courses.

At present NCC unit is functioning as a full fledged Composite Technical Company of three different sections, viz. (i) Engineers Corps, (ii) EME Corps and (iii) Signal Corps, and its designation is "3 Bihar Comp.(Tech.) Coy., N.C.C., B.I.T.., Mesra". It has a sanctioned strength of 200 Cadets.

The 3rd Bihar Comp.(Tech.) Coy of B.I.T., Mesra works under the command of a whole time Army Officer of the rank of Major or Lt. Colonel. In addition, it has on its staff three trained Part-time NCC Officers who are Professors of the Institute, five P.I. Staff from the Army about 8-10 clerical and other supporting staff who are provided by the State Government. Besides an administrative building on the main Campus the NCC unit has adequate facilities like Parade Grounds, Firing Range and Armament Stores, Clothing Stores, Library, Staff Quarters etc.

The training programme is designed to pay stress upon the technical aspects of training in the form of Engg. Projects duly supported by lectures and practical classes (6 period/week); the training for Engineers Corps mainly covers field Work, Field defence, Military Brigades, Roads and Aerodromes; Water Supply, Demolition etc. The Technical

training of EME Corps covers Inspection and repairs of vehicles, Driving practice and maintenance, Acquisition with different components of Automobiles, Mechanism and elementary principles of different class of army vehicles; and for the Signal Corps it covers Wireless equipment operation, Line equipment, Line transmission theory, Acquisition with More's code and handling or telegraphic instruments etc.

Apart from the technical training the NCC also provides general training to all cadets in order to inculcate the leadership qualities, high morals, unity, discipline etc. The NCC has special arrangement for training of those cadets who appear for 'B' and 'C' Certificate exam. of NCC (Tech.).

During the year 1993-94, total 197 cadets were enrolled in the NCC Coy of the Institute. Out of which 87 in the Engineers Corps, 61 in the EME Corps and 49 in the the Signal Corps.

THE STUDENTS' HALLS OF RESIDENCE

The Institute is completely residential and all the students are required to stay in one of the Hostels or Halls of Residence numbered serially - as Hostel .1 to 7. In addition there are two separate Hostels one for girls and the other for foreign students. With the assistance from the U.G.C. and the State Government, one more Hostel for Girls has been constructed and will be ready for use from the next academic session.

All the hostels are laid out beautifully to match the screne and pleasant campus with flower beds, bushes and trees encompassing each hostels, besides the well maintained lawns in front. The architecture of the hostel includes central facilities like spacious Dining Halls in the Centre and Common Rooms and reading Rooms, placed symmetrically on both sides of the central entrance and wide varandahs all along the length with air gaps and balconies well set for common use.

Each student is accomodated in a single-seated room, furnished with a steel table and a steel chair. The girl students are kept in two-or-three furnished rooms. Each room is quite spacious with a big size window and a steel door oppositely placed to make the room airy. Each room has a cup-board, wardrobe and a wide and deep rack.

Each hostel has a Common Room, where Indoor Games are available. Each hostel has a Reading Room also - where sufficient number of Magazines, Periodicals and Newspapers by consensus are made available to the residents of the hostel. Provision of getting the old magazines and periodicals issued to students are available. Each hostel has also been provided with a Color Television Set.

Frequent competitions are organised among the inmates of the hostel in a number of indoor games. Inter-Hostel Tournaments in the indoor and outdoor games are a regular and very attractive feature of the hostel life.

Once in a year, the inmates organise a Hostel-Night, where in the improvised stage, well selected cultural and musical programme, games andspecial items based on intimate knowledge pack the evening with fun and exciting festive mood.

Each hostel has an independent Mess, completely managed by the students through Mess Committee members elected from among the residents themselves. The committee looks after the complete management including the Menu, preparation, purchases and billing under the supervision of the Superintendent/Assistant Superintendent of the hostel. The bills are made on 'no profit no loss' basis and the monthly bills of the residents are submitted in the Mess Accounts Office, where individual student pays accordingly. The menu and monthly bills of the various hostels are assessed and revised periodically in the Meeting of the Hostel Council.

TRAINING AND PLACEMENT

The Training & Placement Division of the Institute is involved in the placement of outgoing students of B.E., B.Pharm., M.B.A., M.C.A. and D.C.A. The Division also arranges industrial training in various organisations spread all over the country during long vacations.

During the last 12 years about 1800 graduates and post-graduates have been recruited through Campus Interviews. During last 10 years, recruitment through Campus interview has been continuously increasing. The recruitment has been mostly in the premier private companies, Government Organisations and Defence Services.

During the last academic session i.e. 1993-94 about 30 premier organisations conducted Campus Interview. By June 1994 about 202 firm offers of appointment were made to graduates from different disciplines. About 12 students received more than one offer.

In addition to arranging of Campus interviews, the Training & Placement Division also sends Bio-Data of students to various organisations in the country for recruitment. In this process many of our out-going B.Pharm. and M.Pharm. students have received call for interview.

During the year under report, over 500 students received training in various organisations during Puja and Summer Vacation.

The Division has acquired a Personal Computer which is being used to store data bank of Industries. A Placement Brochure has also been prepared; and this is sent to industries along with invitation to conduct the Campus Interview.

The details of confirmed appointment offered to the out-going students by various organisations during the year under report is as follows:

DISCIPLINE/BRANCH	NUMBER OF JOBS
B.E. - Mechanical Engineering	71
Production Engineering	12
Electrical & Electronics Engineering	35
Electronics & Comm. Engineering	35
Computer Science	17
Civil Engineering	8
M.B.A.	13
M.C.A.	11

PLACEMENT SUMMARY 1993-94

Name of Organisation	No. of Placement
Crompton Greaves Ltd., Bombay	3
C M C Limited, Calcutta	2
Hind Motor (EED), Madras	2
Hind Motor, Calcutta	12
Hind Motor, New Delhi	2
Hindalco, Renukoot	4
Renusagar Power Corpn., Renukoot	8
HCL-HP, New Delhi	8
Heavy Engineering Corporation, Ranchi	35
Indian Steel & Wire Products, Jamshedpur	4
ITW Signode, Bangalore	3
I C I M Limited, Calcutta	6
Jindal Strips Limited, Bombay	13

Name of Organisation	No. of Placement
Jayshree Textiles, Rishra, Hooghly (Divn. of Indian Rayon & Industries Ltd., Bombay)	5
Larsen & Toubro Limited, Bombay	3
Larsen & Toubro Limited (ECC) Calcutta	8
Orissa Cements Limited, Calcutta	6
Purak Vinimay Ltd., Patna (Divn. of Alembic Chemical Works Limited)	*
Stewarts & Lloyds Limited, Calcutta	2
Tata Consultancy Services Limited Calcutta	21
Tata Iron & Steel Co. Limited, Jamshedpur	5
Tata Engg. & Locomotive Co. Limited, Jamshedpur	8
Tata Telecom Limited, Gandhinagar	3
Tata Cummins Limited, Jamshedpur	4
Tinplate Co. of India Limited, Jamshedpur	7
Usha Martin Industries Limited, Ranchi/Jamshedpur	7
Voltas Limited, Calcutta/Bombay	2
V X L Saurastra Chemical Limited, Porbandar	*
Wipro Systems Limited, Bangalore	8
Wesman Engg. Co. Limited, Calcutta	2

Note: * Final results have not been received in some cases - as marked *.

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Nominee of the Chancellor	:	Prof. Muchkund Dubey
Nominee of the Hindusthan Charity Trust	:	Shri C. K. Birla
" "	:	Shri A. L. Goenka
" "	:	Dr. H. C. Pande
Vice-Chancellor, BIT, Ranchi	:	Dr. B. Kanta Rao
Member of Institute Faculty	:	Prof. G. P. C. Rao
" "	:	Prof. Balram Singh
Member selected by the General Council	:	Shri D. N. Patodia
" "	:	Shri S. R. Jain
" "	:	Shri C. S. Jha
Secretary : Registrar	:	Prof. G. Sahay

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Director of Higher Education Government of Bihar	:	Ex-Officio
Dean of Science Ranchi University	:	Ex-Officio
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Professors of the Institute (Contd.)	:	Prof. K. M. Sirbhaiya Prof. A. P. Singh Dr. S. N. Mehrotra Dr. J. Paul Prof. G. Sahay
Persons appointed by the Chairman vide Clause 4(e) of the Regulations	:	Prof. G. C. Singh Prof. M. K. Saxena Shri R. S. Yadav Dr. D. Jairath Shri R. P. Singh
Librarian (ex-officio)	:	Dr. U. N. Singh
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