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INDIAN INSTITUTE OF SCIENCE
BANGALORE

FOR THE ATTENTION OF THE RESEARCH STUDENTS

July 1979

FOR THE ATTENTION OF THE RESEARCH STUDENTS

Orientation Programme :

Every student admitted to research is expected to undergo an orientation programme immediately after admission to the Department/Section/Laboratory.

Registration :

Simultaneously with the orientation programme, every student admitted for research will have to register for the conferment. They should fill in a prescribed application form, copies of which are available at the Departmental Office as also at the Central Office and should forward the applications to the Registrar through their research guide and the Chairman of the Department along with the application form for scholarship and Code of Ethics, duly signed.

Staff members permitted to register for the research conferments of the Institute are also required to register simultaneously with the regular students completing the admission formalities and the prescribed application form for registration. However in the case of any delay in completing the registration simultaneously with the students, the same will be regulated as follows :

1) if the application for registration is made within six months from the commencement of the session, the effective date of registration

shall be the date of commencement of the session itself ;

ii) if the application for registration is made after six months from the commencement of the session but before 31st March of the next year, the effective date of registration shall be the date of application for registration.

iii) if the application for registration is made after 31st March, the applicants will not qualify for registration. They will have to qualify afresh for admission.

This registrations approved in their cases will be subject to getting a 'no-objection' certificate at the earliest from their sponsors, the responsibility for which will rest with the staff and the Investigators-in-charge of the Scheme/ Project concerned. If the sponsors do not agree to the registration for the research conferment for any reasons, this will have to be reported immediately, in which case the registration of such staff member will stand cancelled.

Training Programme :

Every student admitted for research should undergo a formal training programme, by registering for credits ranging between 12 and 20 as may be recommended by his adviser/research supervisor/ Chairman of the Department. For the Ph.D. degree the research training programme includes atleast two courses with a total of not less than four credits at the 300 level. For successful completion of the training programme each student

should obtain a minimum of grade 'C' in all the courses registered and a Cumulative Grade Point Average of 2.5. If a student fails to secure the minimum requirement as stipulated above in the training programme, his registration for the research conferment of the Institute will not be continued, unless condoned by the Senate.

Comprehensive Examination for Ph.D./ General Test for M.Sc.

After successful completion of the training programme, a candidate registered for the Ph.D./M.Sc. degree is required to undergo comprehensive examination/ general test which will take place normally within two years after joining.

These examinations/tests will be conducted by Boards appointed by the Senate. Candidates should consult their research guides on the syllabus for their comprehensive examination/general test.

A research student must pass the relevant examination/test before he can submit his thesis for the research degree. If he fails in the first attempt he may be allowed to appear once again after a lapse of four months from the date of the first examination.

Break in Studies

Students can be permitted to break their studies either on medical reasons or for acepting jobs, for a maximum period of one year. In the case of break of studies permitted for accepting jobs, the students should have either submitted the thesis or completed all the theoretical and experimental part of the work. In

such cases, the students will have to come back to the Institute at the end of the break permitted, to complete the remaining part of the work/to take the oral examination as the case may be, to qualify for the dcgree.

Candidacy :

After successful completion of the training programme and the comprehensive examination/general test, the candidacy of the candidate for the research conferment will be confirmed.

Submission of Synoposis :

To expedite the evaluation of the thesis, the synopsis of the thesis may be submitted by the supplicant six weeks in advance of the probable date of actual submission of the thesis. This enables fixing of the examiners for evaluation of the thesis, in advance.

Minimum Period of Residence and Researeh :

A research student is required to put in a minimum period of residence and research at the Institute before he is permitted to submit his thesis. The periods prescribed are :

M.Sc. :

For those who hold a Master's degree In Engineering	One year from the date of joining
For those who hold a Master's dcgree in Science or Bachelor's degree in Engineering or Technology	Two years from the date of joining.

Ph.D :

For those who hold a Master's degree	Two years from the date of joining
For those who hold a Bachelor's degree in Engineering or Technology	Three years from the date of joining

Proficiency in English :

Immediately after the students join the Institute, they will be evaluated for their proficiency in English and in case they are found deficient, they will have to undergo a language course in English. This is usually of one term duration.

Thesis Fee :

When submitting thesis for research conferments, the following fees have to be paid by the candidates :

For M.Sc.	Rs. 125
For Ph.D.	Rs. 250

General :

On all matters connected with their research work and the prescribed requirements for the research degrees, the students are advised to seek guidance from their research guides.

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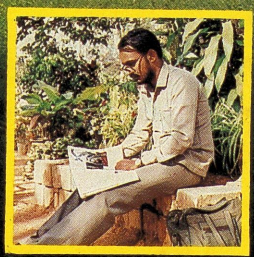
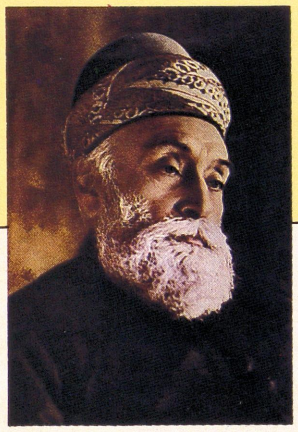


INDIAN INSTITUTE OF SCIENCE

BANGALORE INDIA



"The objects of the Institute shall be to provide for advanced instruction and to conduct original investigations in all branches of knowledge and, in particular, in such branches of knowledge as are likely to promote the material and industrial welfare of India."

J.N. TATA

FOUNDED by Jamsetji Nusserwanji Tata, the Indian Institute of Science has the distinction of being the first institution in the country to promote research in basic and applied sciences. Ever since, the Institute has pioneered research in several areas and significant contributions have prompted leadership and man-power for scientific and industrial development.

IT is from here that Homi Bhabha, the only Reader of Theoretical Physics at the Institute, went on to create the Tata Institute of Fundamental Research and the Atomic Energy Commission. Vikram Sarabhai conducted cosmic ray research and laid the foundation of the Indian Space Programme. Ethyl alcohol as a primary fuel in diesel engines was investigated here for the first time long before the energy crisis was recognised. Radio Communication planning in tropical latitudes was possible due to work in Communications Engineering. Metallurgical research in the early forties was crucial for the then nascent atomic energy programme. And much contribution was made for design projects of aircraft from Aeronautical Engineering.

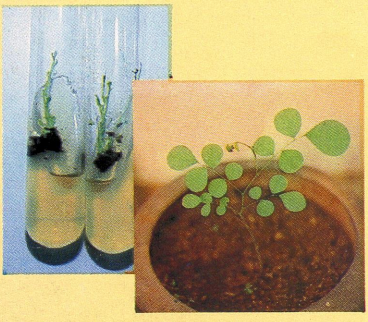
Significant contributions in nutrition, proteins, food technology, vitamins, antibiotics, enzymology, sanitation, biochemistry and various aspects of chemical sciences have been made from the Institute. The Biochemistry Department played a major role in the setting up of the Central Food Technological Research Institute at Mysore. And contraceptive formulations became possible due to work on steroid hormones in Organic Chemistry. On the theoretical front, inter-relationships between classical and quantum dynamics have been explored and the Bhatnagar-Gross-Krook model enunciated here is the most referred to even today in the field of plasmas and rarefied gases.

RESEARCH has also veered towards newer and more challenging fields like bio-technology, ecology, space science, astronomy and astrophysics, atmospheric sciences, crystallography, surface science, materials science and rural technology. Almost all science and engineering disciplines are reflected in the Institute. This makes it possible for the Institute to draw upon multi-disciplinary groups to solve complex problems. Many of the departments receive special assistance from the University Grants Commission and are recognised as Centres of advanced study.

BIOLOGICAL SCIENCES

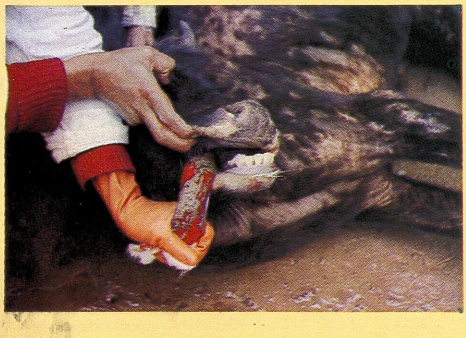
- Biochemistry
- Biotechnology Post-doctoral Programme
- Ecological Sciences
- Microbiology & Cell Biology
- Molecular Biophysics
- Central Animal Facility
- Primate Research Facility

◀ OVSH–a possible male contraceptive vaccine. Lowered sperm production and non-attachment to the egg are observed in monkeys immunised with ovine follicle stimulating hormone.



▲ From a single cell to a plant: the shoots and an eight month old plant of *Dalbergia latifolia* (rose wood). Scientists have been successful in growing genetically desirable, disease resistant plants of rosewood, sandalwood and eucalyptus through tissue culture.

▲ The Ecological Sciences Group has played a catalytic role in the revegetation of degraded hill slopes as part of the ecodevelopment action research in the Western Ghats.

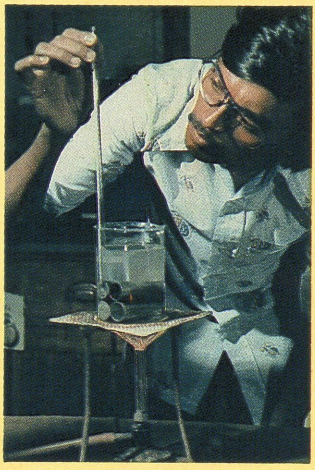


◀ The vaccine for the foot-and-mouth disease that affects cloven footed animals, can now be produced in E. coli by genetic engineering techniques. The vaccine, a protein of the disease causing virus, has been tested on guinea pigs and its efficacy against the disease is now being tested in cattle.

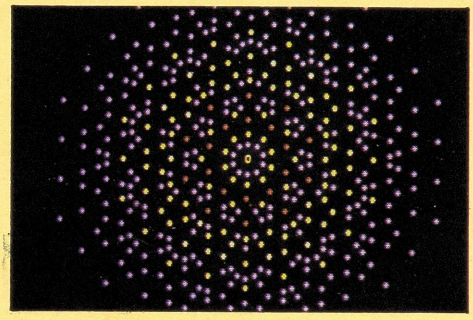
The demand for this vaccine can be estimated through methods devised by our Management Studies group and the Indian Veterinary Research Institute.

CHEMICAL SCIENCES

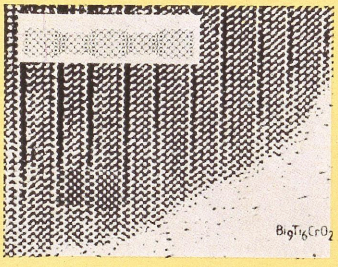
- Inorganic & Physical Chemistry
- Materials Research
- Organic Chemistry
- Solid State & Structural Chemistry
- Sophisticated Instruments Facility



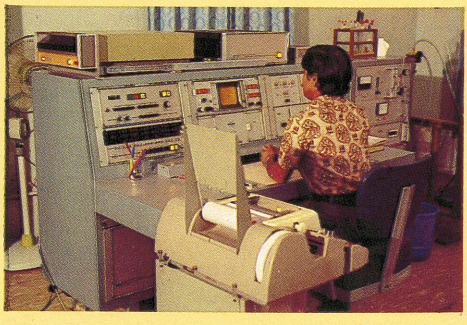
◀ Higher shelf-life for Magnesium-Manganese dioxide batteries is possible through a new electro-chemical method which eliminates pitting corrosion susceptibility of Magnesium cans in these cells. Scientists have also achieved process optimisation of active mass into sintered electrodes for the Nickel-Cadmium rechargeable battery.



▲ A major effort involving physicists, metallurgists and materials researchers is under way to unravel the structure and properties of quasicrystals, a new intriguing class of solids displaying five fold symmetry. A new type of quasicrystal displaying ten fold symmetry in Al-Mn has been discovered by investigators.



▲ Significant contributions in Solid State and Structural Chemistry, a frontier area of research include preparation and characterisation of new materials, and newer methods of synthesis of novel compounds. The first surface science laboratory in the country which has capabilities to probe surfaces with a variety of sophisticated techniques has been established in the Institute.



▲ The Sophisticated Instrument Facility houses the FT-NMR and Solid State NMR spectrometers and transmission electron microscope which process samples received from scientists all over the country.

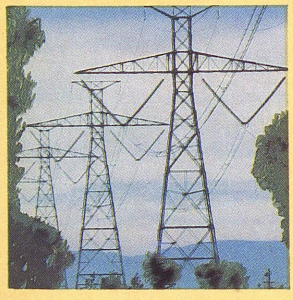
ELECTRICAL SCIENCES

• Computer Centre • Computer Science & Automation
• Electrical Communication Engineering • Electrical Engineering
• Electronics Design & Technology • High Voltage Engineering

An expert system has been developed that is capable of diagnosing diseases of the cardiovascular system. The system is user oriented and can distinguish between coronary and non-coronary diseases. Four types of coronary diseases can be diagnosed, and expansion programmes are under way to diagnose all diseases of the cardiovascular system.

▲The Electronics Design and Technology Centre trains engineers into electronic product designers and has evolved design methodologies for electronic products which covers the industrial, mechanical, thermal, aesthetic and ergonomic aspects of electronic products. These design methodologies are particularly suited to Indian conditions.

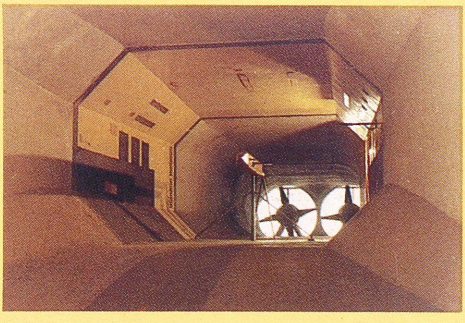
▲The Computer Vision and Artificial Intelligence Group has developed system facilities for processing colour infra-red images of the type shown. Other activities include interactive digital image processing, software development, stereoimage analysis, image reconstruction using projections, synthesis of textures, clustering techniques for remotely sensed data analysis and special purpose computer architecture for the parallel processing of images.



◀Scientists have drawn up blue prints of the national power grid and energy planning. Basic research in power systems area includes real time control, EHV transmission and distribution planning and protection system, to mention a few. New exciting areas such as HVDC systems, multi processing and parallel processing application are being investigated. Areas of power electronics and drives and biomedical signal analysis are also pursued.

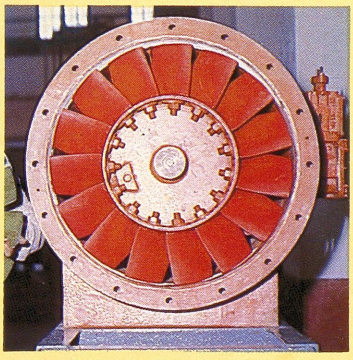
MECHANICAL SCIENCES

- Aerospace Engineering
- ISRO-IISc Space Technology Cell
- Chemical Engineering
- Civil Engineering
- Management Studies
- Mechanical Engineering
- Metallurgy

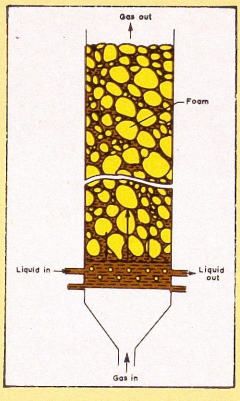


◀ This low speed wind tunnel is the largest of its kind in the country with wind speeds of upto 400 kmph and a test section of 14′ × 8′. Space probes designed by ISRO and aircraft designed in the country have been tested in this facility. Other applications include wind effects on cooling towers, bridges and chimneys.

▲ Studies on irrigation water management have been made through the use of farm pond for protective irrigation, percolation tank for increasing ground water recharge, design and operational issues of main canal management and water conservation by land treatment.



▲ Work in turbomachine fluid mechanics is concerned with boundary layers and stall in axial impellers. The blades of an underground mine fan developed here are of fibre reinforced polyester. Current research includes establishment of scale up procedures for development of large turbomachines through model tests.

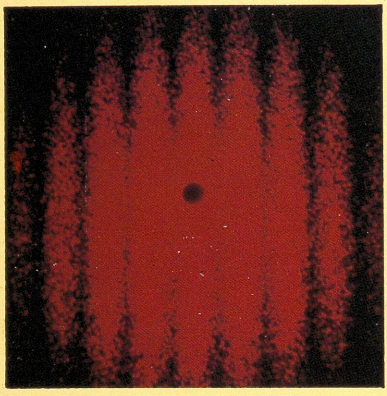


◀ Work on foam bed reactors which have great potential for pollution control has hitherto been empirical. Scientists have developed the very first theory which can predict the performance of such reactors by taking the actual structure of foam into account.

Also, the largest indigenously designed fluidised bed reactor to handle very fine particles at elevated temperatures for the manufacture of copper sulphate directly from chalcopyrites, was developed by our chemical engineers.

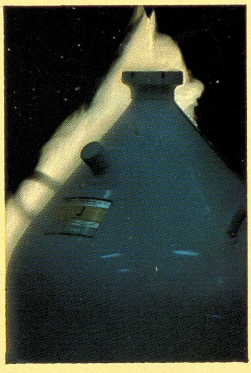
PHYSICAL & MATHEMATICAL SCIENCES

- Applied Mathematics
- TIFR-IISc Mathematics Programme
- Central Cryogenic Facility
- Centre for Theoretical Studies
- Foreign Languages Section
- Instrumentation & Services Unit
- Physics
- Astronomy & Astrophysics Programme

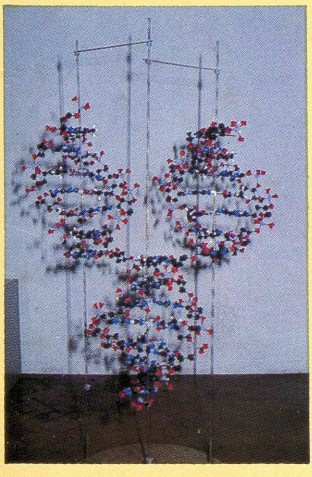


▲Speckle interferometry has been used for the measurement of small displacements and vibrations. A number of fibre optic sensors based on speckle phenomena have been developed for the measurement of current and magnetic fields and refractive index of liquids.

Theoretical findings suggest that the physics at the 'mobility edge' separating the metallic and the insulating phases is dominated by 'Sinai' fluctuations. Scientists have also made definite experimental predictions – quantum noise, low temperature dependence of resistance, dispersive transport which are important for the proper understanding of metal-insulator transition.



▲Low temperature studies have led to indigenous development of thermal insulation and fabrication of materials for cryogenic containers used in various fields—research, artificial insemination and cryosurgery. Process knowhow transferred to industry has resulted in cryogenic containers of 30 litres capacity which were being imported until now. Expertise is also available for a 400 litres superinsulated liquid nitrogen tank.



◀The first crystallisation of DNA sequence d (A-T-A-T) and X-ray studies have shown the dependence of structure on base sequence.

DNA-mitoxantrone complex: Scientists have also been successful in the first crystallisation and crystal study of an anti-cancer drug in interactions with left handed Z-DNA, which has implications in anti-cancer drug design on a molecular basis.

CENTRES

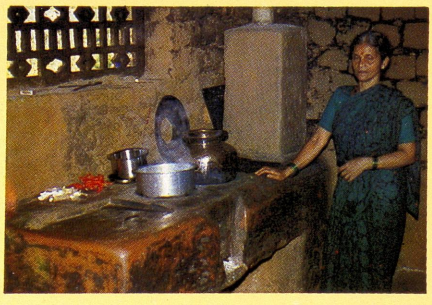
- Application of Science & Technology to Rural Areas (ASTRA)
- Atmospheric Sciences • Continuing Education
- Microprocessor Applications • Science Information
- Scientific & Industrial Consultancy • Computer Aided Design
- IISc-DRDL Joint Advanced Technology Programme • Library

Continuing Education: Besides formal education and research, the Institute also imparts knowledge through short term educational and training programmes to a wide spectrum of people. The Continuing Education Programme which is disseminated through the Continuing Education Centre, covers a range of topics which are extremely popular. Nearly 3000 students undertake these courses every year.

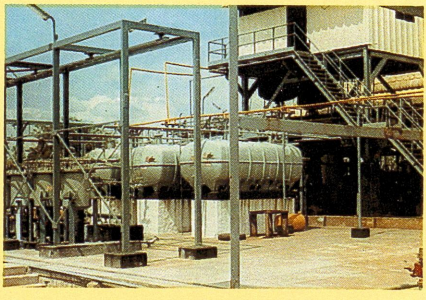
Other activities include the Quality Improvement Programme for Engineering College Teachers, Extension Courses for Working Engineers and Scientists, and High School Science Teachers' Programme.

ASTRA: Technology for rural areas is one of the primary concerns of Indian Scientists, and the Centre for the Application of Science and Technology to Rural Areas was set up in the Institute to catalyse the development and testing of village oriented technologies. The Centre has taken up several problems: biogas technology, water management, low cost housing and energy consumption.

The ASTRA 'Ole', a wood burning stove made of mud (3 pan variety, 4 Kw), with an efficiency in the range of 35-45% is used in rural Karnataka and leads to a significant saving in fire-wood to the extent of 65%. ▼



Consultancy: The Institute maintains strong and mutually beneficial ties with industry. The Institute-Industry interaction is via the Consultancy Centre which takes care of transfer of technology, systems analysis, design and development of products and processes, software development, advice in setting up of inhouse R&D laboratories, and critical overviews. Besides, the Centre also ensures a continuous and easy flow of information to technologists and entrepreneurs on the research and developmental activities at the Institute.



▲ One of the most impressive Institute-Industry collaborations has been the Silicon Project for Mettur Chemical and Industrial Corporation Ltd. Joint research of several years has resulted in the birth of a maiden plant for silicon tetrachloride and ethyl silicate.

Another successful venture is the manufacture of electronic grade and polycrystalline silicon for growing single crystals, and in the manufacture of wafers which find extensive use in silicon solar cells for photovoltaic applications and electronic devices.

RESEARCH and teaching are the hall-marks of this Institute, which was started in 1909. In fact, the whole spectrum of post-graduate engineering education in the country was initiated here. There are 1500 active full-time researchers on campus, and 1400 graduate students – half of them pursuing research degrees. Every year nearly 150 are awarded the Master's degree in Engineering and an equal number the research degrees. Almost all students receive some form of financial aid.

The wealth of the Institute lies in its people – its faculty and students, its supporting and technical staff. The Institute has an impressive 425 faculty who have been recognised for their work in many areas. There is a galaxy of Bhatnagar awardees and Fellows of Science Academies. The Nobel Laureate, Sir C.V. Raman, was closely associated with the Institute and set the field for optics and spectroscopy. The faculty also includes two Fellows of Britain's Royal Society. The Institute draws eminent people in science and engineering from all over – it plays host to nearly 900 visitors every year, of whom 400 are from overseas.

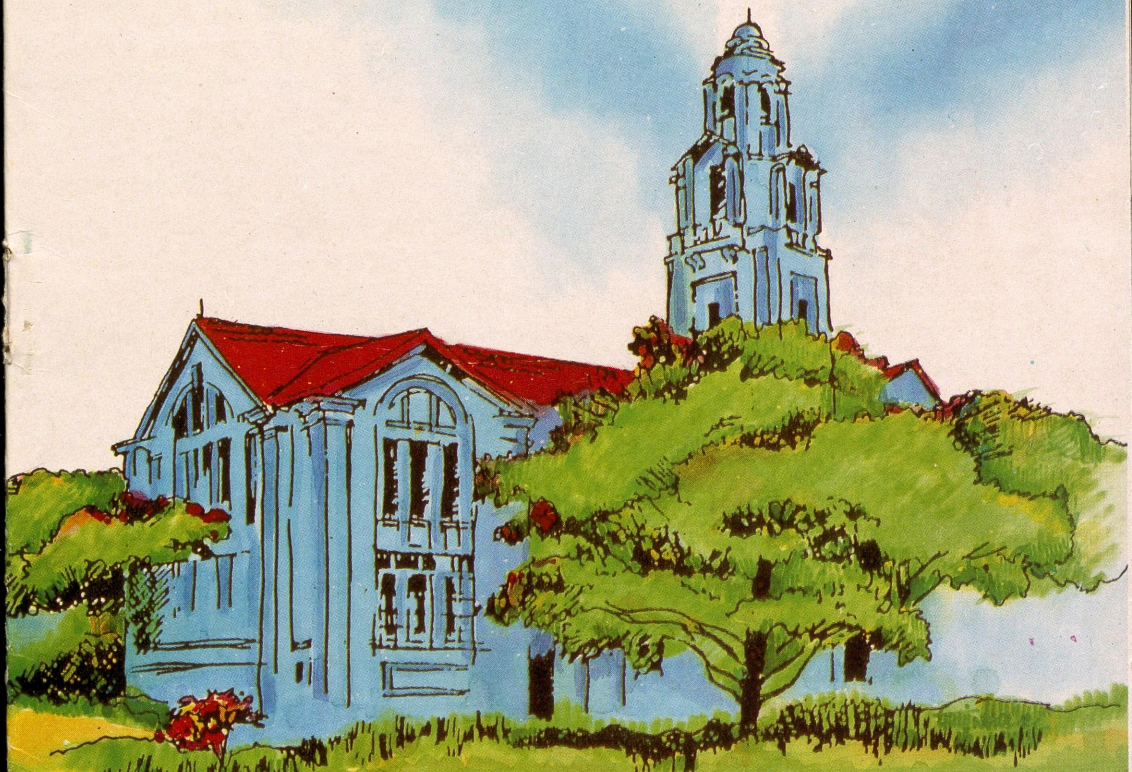
The Institute contributes much to scientific and technical literature and nearly 900 papers are published by the faculty annually in scientific and technical journals of national and international repute.

BASIC and applied research in a number of disciplines has been sponsored by several public and private, research, development and industrial organisations, both national and international. The projects have enabled studies in a number of emerging areas of science and technology in addition to providing the much needed funding for equipment and facilities.

Faculty and students are supported by a number of facilities and services – from a DEC-1090 computer to a single crystal X-ray diffractometer to a library that houses 2,75,000 books and subscribes to nearly 1800 journals.

In this folder, it has been possible to communicate only some of the significant contributions of the Institute and its role in the scientific and industrial development of the country. The presentation here is only illustrative and by no means comprehensive.

FACULTY INFORMATION BROCHURE



INDIAN INSTITUTE OF SCIENCE, BANGALORE

A faculty member of the Institute is entitled to most of the benefits provided by the Govt. of India, besides several benefits specially formulated by the Institute. In addition, the Institute provides several academic and campus facilities for the benefit of the faculty. This brochure provides an outline of the various benefits and facilities to IISc faculty. This is not a formal document, and the statements herein should not be taken to be the complete set of rules.

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E-mail : name@dept.iisc.ernet.in

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I. BENEFITS

I.1 Medical

Campus Health Centre (Ext: 2234)

- A 12 bed health centre, with X-Ray, diagnostic lab, dental and ophthalmic clinics and minor surgical facility, for on-campus out-patient and emergency services.
- A medical staff of full time general practitioners and nurses, as well as consulting gynecologist, dentist, psychiatrist and ophthalmologist.
- Off- campus residents can avail of designated area doctors

Medical Reimbursement (Unit V- Ext: 2252)

- For medicines prescribed by health centre doctors or designated area doctors.
- Other reimbursement as per G.O.I. Medical Attendance Rules.

I.2 Mutual Benefit Fund (MBF) (Unit IB - Ext: 2232)

MBF (Old) Subscription: Rs. 10/- per month

Benefits:

- Grant or interest free loan for medical treatment or educational expenses of self or dependents.
- Grant in case of death of spouse, parents or dependents.
- Grant of Rs. 8000/- to nominee in case of death of staff member.

MBF (New) Subscription: Rs. 25/- per month (Rs. 8.30 per month is credited towards an ex-gratia grant in case of death of the staff member, and the balance to a Savings Fund of the member).

Benefits:

- Ex-gratia of Rs. 25,000/- together with subscription towards savings fund and interest accrued thereon to the nominee, in case of death of the staff member.
- On resignation/retirement, subscription towards savings fund together with interest will be paid.

I. 3 Leave (Unit IA - Ext: 2231)

Type of leave	No. of Days p.a.	Remarks	Sanctioning Authority
1. Casual Leave	15	Cannot be carried forward, cannot be combined with other kinds of leave	Dept. Chairman
2. leave for academic work	15	scientific and technical committee meetings - only days of meeting	"
3. half-pay leave	20	no limit for accumulation; can not be encashed	Registrar
4. commuted leave	-	on medical grounds - twice the amount of such leave is debited to half-pay leave	"
5. earned leave	30 (maximum)	depends on no. of days of (summer) vacation not availed of; accumulation-maximum 240 days during entire service; can avail maximum 180 days at a time; unutilised leave can be encashed at the time of retirement	"
6. extraordinary leave		can be availed of when no other kind of leave is available, or at the request of the individual staff; when on academic work, counts towards active service on payment of contribution	"
7. special study leave	-	for study or training, having direct bearing on the work; maximum 2 years combined with earned leave and vacation; counts for increment	"
8. maternity leave	-	women member of the staff with less than two surviving children; maximum 90 days at a time with full pay; 6 weeks for miscarriage/ abortion	"
9. sabbatical leave	-	Not exceeding one year after six years of approved service	Director

Note: In case the individual staff member is going abroad, specific approval of the Director is necessary for any kind of leave.

I.4 Terminal Benefits (Unit V - (Ext:2252))

- Faculty can opt either for GPF/Pension/Gratuity or CPF/Gratuity
- Benefits on retirement :

GPF / PENSION / GRATUITY	CPF / GRATUITY
1. Provident Fund amount at credit as on date with interest	Individual subscription at a minimum of 8 1/3% of salary and Institute contribution of 8% with interest thereon, according to rules.
2. Pension depending on the length of service	-
3. Commutation upto 1/3 of pension	-
4. Gratuity at the rate of 15days pay for every completed year of service, subject to a maximum of Rs.1,00,000/- or16 1/2 times of pay whichever is less.	Gratuity at the rate of 15 days pay for every completed year of service, subject to a maximum of Rs. 1,00,000/- or 16 1/2 times of pay, whichever is less.

Additional benefits :

- Encashment of earned leave at credit subject to a maximum of 240 days

- Maximum of Rs. 2000/- as Grant under old MBF, if no assistance has been availed during the entire service, and subscription towards savings fund under new MBF, together with interest.

I.5 Loans, Advances, Reimbursements and Subsidies

House Building/Purchase Advance (Unit V - Ext: 2237)

- Eligibility: permanent staff member with 5 years of service
- Advance admissible: 50 months basic pay or Rs. 2,50,000/- whichever is less.
- Terms: at G.O.I. prescribed interest rates.

Housing loan interest subsidy (Unit V - Ext: 2237)

- Eligibility: permanent staff member with 3 years of service admissible on loans taken from LIC, HDFC, Housing Corpn., Co-op Housing Societies, etc., upto Rs. 1,87,000/- or 50 months basic pay or actual amount of the loan whichever is less.
- Interest subsidy rate: (LIC rate + 1%) or actual rate paid, whichever is less, minus G.O.I. prescribed rate.

House leasing Advance (Unit III Ext: 2230)

- Interest free Advance equal to 6 months rent or 50% of the advance paid by the staff member whichever is less for leasing off - campus accommodation, subject to availability of funds.
- Refundable upon termination of lease

Provident Fund Account: Loans and Withdrawals (Unit V - Ext 2252)

- Loans upto 3 months pay or 50% of the subscription whichever is less for medical expense, children's education, religious function etc.
- Loans upto 75% of subscription in exceptional cases.
- Withdrawal permitted for purchase of house / site, upon completion of 10 years of service.
- Withdrawal permitted for certain purposes upto 75% of account balance, upon completion of 20 years of service.

Reimbursement of Tuition fee (Unit V - Ext:2252)

- Standard I - X: Rs.20/- per child per month
- Standard XI - XII: Rs.25/- per child per month
- Physically handicapped child: Rs.50/- per month

Transport Allowance (Unit III - Ext: 2252)

- Paid to permanent staff members residing outside the campus.
- The city of Bangalore has been divided into three zones and the amount of allowance is paid according to pay scale and the zone where one resides.

Reimbursement of Telephone Rental (Unit V - Ext: 2237)

- To Chairmen of Divisions, Chairmen of Departments, and Deans, who are assigned duties that require use of Telephones, and all Assosiate Professors and Professors

Reimbursement of Society Membership (Unit V - Ext: 2237)

- Eligibility: permanent staff members
- Full annual membership fee paid to one Indian professional society, and 50% of the annual membership fee paid to one foreign professional society (in Indian Rupees)

Vehicle Advance
(Motor Car - Unit VI- Ext: 2253, Scooter - Unit - III - Ext: 2230)

- Eligibility: permanent staff members
- For purchase of motor car (basic pay > Rs.3500/-) and motorcycle/scooter (basic pay > Rs. 1500/-)
- Interest at the rates prescribed by G.O.I

I.6 Leave Travel Concession (LTC)

Faculty and their family (dependent spouse, parents and children) are eligible to travel to their home town twice, or once to home town and once to any place in India, during a block period of 4 years as defined by G.O.I. Only Rail/Bus fares by the shortest route for the eligible class is paid.

I.7 Conferences/Seminars/Symposia

Participation(unit IA - (Ext: 2231))

- Prior approval necessary
- Normally period of travel and days of conference/seminar/symposia treated as on-duty
- To faculty members participating in conference abroad, limited travel assistance is provided from GARP funds, depending on the availability of funds
- Interest free loan recoverable in instalments for visit abroad for attending scientific conferences/symposia, etc.

Organisation (Public Relations Officer: (Ext: 2228))

- Faculty members can organise seminars, symposia and summer programmes in their area of research through assistance from outside agencies. Accommodation for participants can be booked through the Public Relations Officer in the Guest House/Hoysala Hostel and at other places
- Proposals for such programmes to be sent to Divisional Chairman through Dept. Chairman

II. CAMPUS FACILITIES

(numbers in square brackets indicate location on campus map inside back cover)

II.1 Accommodation on Campus [5,14]

Only limited accommodation is available to the faculty. Accommodation is allotted on the basis of seniority. Members are required to register for accommodation, whenever such announcements are made.

II.2 Academic Facilities

- Library [24]: the best scientific/technical library in India with over 3,50,000 volumes
- Literature Information Services [24]: current literature awareness service, bibliographic search service, provided by National Centre for Science Information, (NCSI)

- Computing [80]:Super Computer Education and Research Centre with a VAX8800, CYBER 99, SUN and IRIS workstations, all networked, and accessible through a campus wide terminal distribution network
- Electronic Mail: worldwide electronic mail via the Education and Research Network (ERNET)

II.3 Campus Amenities

Faculty Club [72] and Gymkhana [40]

- Membership compulsory
- There is a swimming pool, and a film club

Eating Out On-campus

- Indian Coffee Board (near the Campus Book Store [61]

- Dining Hall [75]
- Faculty Club [72]

Shopping On-campus

- Amenities Block [71] opposite TIFR building [2] and near C & D housing
- Laundry, haircutting saloon, and tailor in students' hostel block 'H'

Creche and School

- Creche facility available for children of the staff on payment of nominal charges. This is situated behind the Tata Memorial Sports Club [15].
- Kendriya Vidyalya [7] (I standard to XII standard), intended for children of the staff of the Institute, situated near Faculty Quarters in Yeswanthpur.

Communication

- Telecom Bureau [27] situated close to the main building provides facilities for Telegram, Telex, Fax, E-mail- Working hours 7:00 am - 10:00 pm. ISD & STD (smart card) - working round the clock.
- Post Office [50]: (PIN code 560 012), with speed post facility, situated just outside the campus. Working Hours: 9:00 AM - 5:00 PM, Mon. to Sat.

Banking

- On-campus branches of Canara Bank (16) and State Bank of India [43] with foreign exchange facilities

III. MISCELLANEOUS PROVISIONS

Appointments: All faculty appointments are made initially on contract for 5 years. On renewal of contract, an individual is given the option either to continue on contract or to change to superannuation.

Deputation: Faculty members may be permitted to accept invitations to higher positions on deputation terms, provided the borrowing organisation meets liabilities such as terminal benefits, leave salary etc.

Lien: Faculty members may be permitted to go on lien accepting higher positions in other autonomous bodies or Government Institutions. In such a situation, the individual faculty member or the Organisation where he/she accepts the offer has to pay for terminal benefits, leave salary etc.

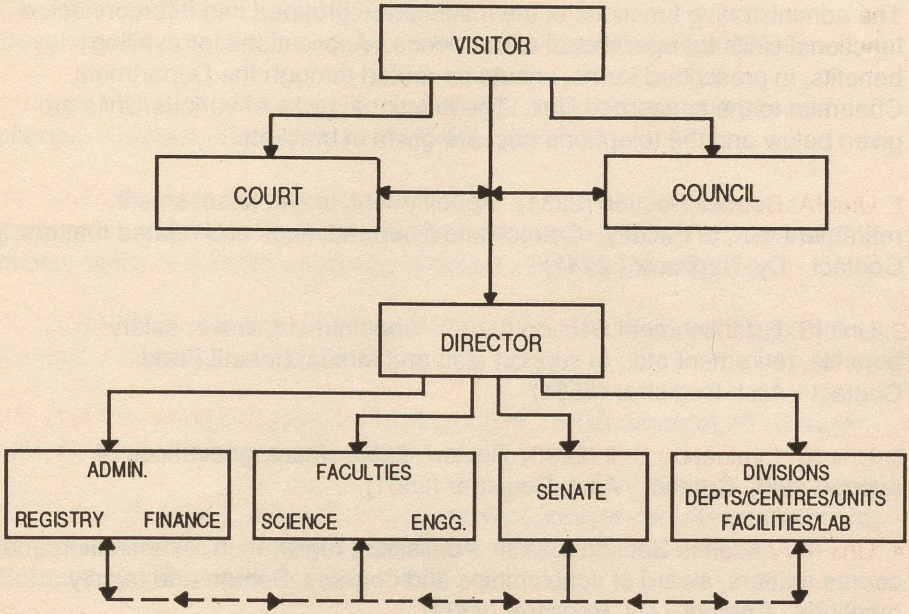
Voluntary Retirement: Faculty members who have put in a minimum service of 20 years can take retirement voluntarily, with due notice. They are entitled for pro-rata pension and other benefits, according to rules.

Projects and Schemes: Faculty members are encouraged to approach outside agencies such as DST, ARDB, CSIR, ICMR, UGC, DOE etc., for sponsored projects / schemes of specified duration.

Consultancy: Staff members are welcome to undertake consultancy work without detriment to their normal research and academic work. The clients include Public, Private, Joint Sector Units, R&D Laboratories, Educational Institutions etc. Consultants are eligible for a share in the consultation fee for scientific/technical advice.

Continuing Education: Staff members can offer courses under the PROFICIENCE program during evening hours on areas of current interest and on identified topics, to enable participants to refresh and update their specialised knowledge. Such staff members are paid suitable honorarium.

IV ORGANIZATION CHART



Admin. Units and their Functions

V. ADMIN. UNITS AND THEIR FUNCTIONS

The administrative functions of the Institute are grouped into interconnected functional Units for operational convenience. Applications for availing benefits, in prescribed forms, should be routed through the Department Chairman to the concerned Unit. The functional tasks of various Units are given below and the telephone nos. are given in brackets.

1. Unit IA: Council Section (2231): Appointment, leave, assessment, retirement etc., of Faculty. Council and Court meetings and related matters. Contact - Dy. Registrar (2241)

2. Unit IB: Establishment Section (2232): Appointment, leave, salary benefits, retirement etc., of support staff and Mutual Benefit Fund Contact - Asst. Registrar (2501)

3. Unit IC: Evaluation Cell (2293) Review, assessment, grievances of support staff. Contact - Asst. Registrar (2501)

4. Unit II: Academic Section (2233): Admission, registration, examination and course matters, award of scholarships and degrees. Senate and faculty meetings. Contact - Dy. Registrar (2333)

5. Unit III: Campus Section (2230): Transport, telephone matters, mail, telex etc.,campus accommodation, house leasing advance.
Contact - Asst.Registrar (2500)

6. Unit IVA: Purchase Section (2217): purchase of equipment, chemicals, stationery etc., - both local and import including customes clearance. Contact - Sr. Purchase Officer (2201)

7. Unit IVB: Bills Section (2251): Payment of bills, paying of duty charges etc. on imported goods. Contact - Accounts Officer (2465)

8. Unit V: (i) Salary Section (2252): Payment of salary; Income tax deductions; TA and LTC advances; reimbursement of medical bills etc.
(ii) PF Section(2252): PF and terminal benefits reimbursement of medical bills.
(iii) Scholarship Section (2237): Payment of scholarship, house building interest subsidy, telephone bills, reimbursement of membership fee of advance, professional bodies etc., Contact - Accounts Officer (2570)

9. Unit VIA: Budget Section (2253): Preparation of budget, payment of honorarium, travel and other expenses from Institute funds
Contact - Dy. Financial Controller (2207)
Development project accounts etc. Contact - Accounts Officer (2465)

10. Unit VI B: Cash Section (2237): Receipts and disbursement of cash/ cheque. Contact - Dy. Financial Controller (2207)

11. Unit VIIA: Scheme Section (2244/2254): Forwarding of scheme proposals and linkage with outside agencies, recruitment of scheme staff, maintenance of scheme accounts, Contact - Dy.Registrar (2355)

12. Unit VIIB: Stores (2243): Issue of items from Chemical and Engg. Stores. Contact - Stores Officer (2370)

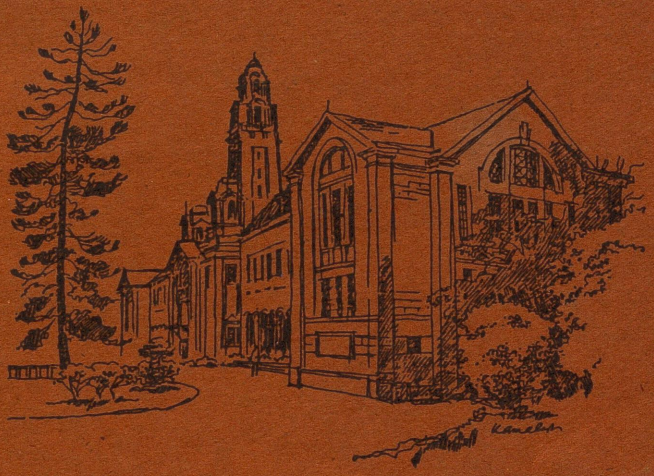
13. Unit VIII: Audit Section (2255): Auditing of TA/DA, Medical, PF/Gratuity bills. Contact - Internal Auditor (2208)

14. Public Relations Office (2228): Accommodation and travel arrangements of visitors, helping in organising seminars, symposia, conferences.
Contact - Public Relations Officer (2228)

15. Security Office (2400): Security of the campus and vital installations, fire fighting and help in any emergency. Contact - Asst. Security Officer (2400)

16. Estate Office (2203): Planning and construction of new buildings, maintenance arrangement for supply of water and electricity.
Contact - Proj. Engineer-cum-Estate Officer (2202)

COURSES OF INSTRUCTION



TIME TABLE

FOR

AUGUST - DECEMBER 1991

INDIAN INSTITUTE OF SCIENCE

BANGALORE

CONTENTS

Printed at INSDOC Regional Centre, Bangalore 560012

PREFACE

This booklet presents the time schedules of the courses offered during the term August-December 1991.

The time table has been prepared by the following committee with the assistance of the staff of the Academic Section.

Prof B N Raghunandan (AE)
Dr S K Bhattacharyya (SERC)
Dr Y Narahari (CSA)

The Committee has taken into account the registration pattern of the previous year and has arrived at a time table in which clashes are minimized to the extent possible. However, if some clashes do persist, the students could get in touch with the Chairmen of the concerned Departments to sort out such issues.

The material in this booklet has been arranged Divisionwise. The courses pertaining to individual departments are listed under the appropriate Division.

Time slots and lecture rooms have been provided for most of the courses. The schedule for the rest of the courses may be arranged by the instructors concerned in consultation with the students and intimated to the Academic Section.

Any suggestions for improving the time table are welcome.

I wish to thank the members of the time-table committee and the staff of the Academic Section for their efforts in formulating the time table.

Prof M A L Thathachar,
Chairman
Senate Curriculum Committee

August 1991

GUIDE TO TIME TABLE

The Time Table for each course is presented in two or more lines. The first line gives the course number, the credits and the course title. If it is only a lecture course offered in one section, the second line will give the initials of the Instructor/s the day-time schedule and the room in which the lecture is held.

The letters M, T, W, Th and F indicate the days of the week starting from Monday. The number after the day indicates the hour at which the lecture is scheduled. With regard to laboratory, the duration of the class will be three consecutive hours per credit as specified. The class rooms are indicated by the room number and the department building in which the room is located.

For Example:

EO 253N	3:1	Operating Systems			
(E3 210)		MJ	MWF	2	L6CL

implies that the course EO 253N (Old Number -E3 210) carries 4 credits, 3 of which are lecture hours and one laboratory session of 3 hours. The course is offered by Prof Mathew Jacob on Monday, Wednesday and Friday at 2 P M in Room No 6 of the Central Lecture Hall Complex. Also the schedule for the Laboratory session will be fixed by the Instructor.

In case of courses with a number of sections, the second and subsequent lines give similar information.

NOTE TO INSTRUCTORS

Whenever there are any additions, alterations and cancellation of courses, the Instructors are requested to intimate the same immediately to the office located in the Central Lecture Hall Complex. If rooms are required to meet such changes new schedules will have to be worked out. The Academic Office located opposite the Staff Longue in the Central Lecture Hall Complex should be contacted for this purpose.

****

Course No	Credit	Title/Instructor	Time Slot		Room No
(1)	(2)	(3)	(4)		(5)
		DIVISION OF BIOLOGICAL SCIENCES			
DB 201	3:0	Molecular Biology FM	MWF	9	BC
BC 201	1:0	Biomembranes: Genesis and Energetics TR/PSS	M	10	BC
BC 202	2:0	Comprehensive Biochemistry FM	WF	10	BC
BC 203	1:0	Plant Molecular Biology CJ	M	11	BC
BC 204	2:0	Perspectives in Immunology PVS/RM/AK	TTh	9	BC
BC 205	2:0	Molecular Endocrinology and Reproductive Biology AJR/PRA/RD/KON	TTh	10	BC
BC 206	1:0	Interaction at Active Sites of Enzymes CSV/DNR	T	11	BC
BC 207	2:0	Protein Structure, Kinetics and Regulation of Enzyme Reactions NAR/HSS/MRNM	WF	11	BC
BC 208	1:0	Topics in Cell Biology RM	Th	11	BC
EC 201	2:0	Introduction to Ecology NHR/RS	MW	9	CES
EC 202	2:1	Behaviour and Sociobiology RG	TTh	9	CES

(1)	(2)	(3)	(4)		(5)
EC 203	2:0	Population Theory SG	MW	10	CES
MC 201	0:3	Laboratory Techniques FM	MWF	2	MC
MC 203	2:0	Microbiology GRR/AA	MW	12	MC
DB 301/ MC 301	2:0	Gene Expression & Development VN/UV/SM/VB	TTh	12	MC
MC 302	2:0	Advances in Immunology RN/PAK/RM	TTh	2	MC
MB 201	2:0	Introduction to the Principles of Bio- physical Chemistry SV	TTh	11	MBU
MB 202	1:0	Biochemical Techniques in Nucleic Acid and Protein Research SKB	T	10	MB
MB 204	3:0	Molecular Spectroscopy and Structure PB	MWF	9	MBU
MB 205	2:0	Introduction to X-ray Crystallography MV/TNG	MWF	10	MBU
MB 206	1:1	Basics and Methodology of Conformational Analysis With Special reference to Peptides and Proteins CR	W	11	MBU

(1)	(2)	(3)	(4)	(5)
CG 201	2:0	Principles of Genetic Engg FM	TTh 10	CG

(1)	(2)	(3)	(4)	(5)
		DIVISION OF CHEMICAL SCIENCES		
CD 201	3:0	Physical Chemistry-I FM	MWF 9	IP
CD 202	3:0	Inorganic Chemistry-I FM	MWF 10	IP
CD 203	3:0	Organic Chemistry-I FM	MWF 11	OC
CD 204	3:0	Basic Mathematics, Functions, Limits FM	TTh 11-12-30	IP
CD 210	3:0	Physical Methods & their applications FM	TTh 8.30-10	IP
CD 221	3:0	Solid State Chemistry FM	MWF 2	IP
CD 222	3:0	Chemistry of Biological Systems FM	TTh 2-3-30	IP
IP 201	3:0	Physical Chemistry - I PKD/KK	MWF 11	IP
IP 211	3:0	Inorganic Chemistry-I VK/AGS	MWF 12	IP
IP 221	2:1	Spectroscopic Methods in Inorganic Chemistry DNS/SSK	TTh 10	IP
IP 224	2:0	Crystalography for Chemists KV/MN	TTh 12	IP
MR 301	2:0	Material Science-II TRNK/AMU/SAS	TTh 11	MRC

(1)	(2)	(3)	(4)		(5)
OC 252	3:0	Structure & Reactivity in Organic Chemistry JC/TNG/SC	MWF	9	OC
OC 253	1:0	Chemical & Functional Aspects of Biological Systems KMM	T	9	OC
OC 254	1:0	Biomimetic Chemistry UM	Th	9	OC
OC 255	1:0	Topics in Stereochemistry SNB	M	10	OC
OC 256	3:0	Advanced Organic Synthesis GSRS/AS/SC/TRK	WThF	10	OC
SS 201	3:0	Introductory Chemical Physics SR/DDS	MWF	9	SSCU
SS 202	3:0	Principles of Physical Chemistry BB/SY	MWF	10	SSCU
SS 203	3:0	Chemistry of the Solid State JG/AKS	TTh	9-10-30	SSCU
SS 204	3:0	Symmetry & Structure in the Solid State TNG/FM	MWF	11	SSCU

(1)	(2)	(3)	(4)		(5)
		DIVISION OF ELECTRICAL SCIENCES			
EO 102N (E3 108)	2:2	Introduction to Programming & Data Structures RCH	TTh	10	L9CL
EO 103N (E3 125)	1:1	Programming Language Lab KSS	M	12	L4CL
EO 104N (New)	1:1	Engineering Graphics NVC/MKS/CEP	T	9	L5CL
EO 203N (E3 206)	3:0	Computer Programming using PASCAL YVR	MWF	9	L9CL
EO 204N (E3 208)	3:0	Design of Information systems using Cobol KSS	MWF	2	L4CL
EO 205N (New)	2:0	Computer Programming using C Language	T	8	L1CL
		SKB	F	8	L4CL
EO 215N (E3 270)	3:0	Programming Language Theory CH/PS	MWF	11	L6CL
EO 121N (E3 106)	3:0	Formal Languages and Automata SVR	MWF	8	L5CL
EO 221N (E3 204)	3:0	Formal Languages and Automata Theory	TTh	10	
		PS	F	12	L5CL
EO 229N (E3 249)	2:1	Numerical Methods for Parallel Computers SKS/SKG	MW	11	L12CL
EO 325N (E3 322)	3:0	Topics in Algorithms AS	MWF	2	L7CL

(1)	(2)	(3)		(4)		(5)
E0 234N (E3 234)	3:0	Computational Combinatorics CEVM		TTh	2- 3-30	L6CL
E0 241N (E3 201)	3:0	Computer Organization and Design AAS/SNR	(AAS) (SNR)	MWF MWF	10 10	L7CL L6CL
E0 243N (E3 209)	3:0	Computer Architecture LMP/KG/TMJ		MWF	3	L4CL
E0 245N (E3 245)	3:0	Fault-Tolerant Computing LJ		TTh	11- 12.30	L5CL
E0 247N (E3 253)	3:0	Modelling and Performance Evaluation YN		MW	8.30- 10	L6CL
E0 251N (E3 216)	3:1	Data Structures & Algo- rithms YNS		TTh	8.30- 10	L4CL
E0 253N (E3 210)	3:1	Operating Systems MJ		MWF	2	L6CL
E0 257N (E3 269)	3:0	Programming Language Design KG		MWF	9	L12CL
E0 261N (E3 221)	3:0	Database Management Systems DKS		MWF	10	L5CL
E0 271N (E3 212)	2:1	Computer Graphics SM		TTh	3	L7CL
E0 273N (E3 271)	2:1	Scientific Visualization CEP		MW	12	L5CL
E0 281N (E3 260)	3:0	Simulation of Large Scale Integrated Circuits VV		MWF	10	L7CL

(1)	(2)	(3)	(4)	(5)
E1 211N (E3 225)	3:0	Artificial Intelligence VVS/PS	TTh 11- 12.30	L4CL L9CL
E1 312N (E3 327)	3:0	Natural Language Processing GK	MWF 10	L12CL
E1 314N (E4 310)	3:0	Learning Automata and Neural Networks MALT	TF 2- 3.30	PE302
E1 142N (E4 104)	3:0	Linear Control Systems ISNM	MWF 9	PE302
E1 241N (E4 202)	3:0	Dynamics of Linear Systems URP	MWF 10	L8CL
E1 245N (E3 215)	3:0	Computer Aided Design for Digital Computer applications IGS	MWF 12	L9CL
E1 253N (E4 213)	3:0	Topics in Optimization SSK	MWF 8	L7CL
E1 254N (E4 218)	2:0	Analysis and Optimization of Stochastic Systems VSB	MT 2	PE303
E1 255N (E4 211)	3:0	Differential Games: Theory & Applications URP	MWF 11	L5CL
E2 101N (E2 101)	3:0	Probability Theory AM/PSN/GVA/AK	TTh 11- 12.30	L8CL
E2 202N (E2 210)	3:0	Random Processes GVA	MW 4- 5.30	L4CL
E2 204N (E3 255)	3:0	Stochastic Process and Queuing Theory AK	8.30 TTh 10	L9CL

(1)	(2)	(3)	(4)	(5)
E2 211N (E2 202)	2:1	Digital Communication BSS/UM	TTh 8	L5CL
E2 223N (E3 257)	3:0	Communication Protocols PV	11- TTh 12.30	L11CL
E3 111N (New)	3:1	Devices & Analog Electronics MKR/SS/KR/APS/MVS	10- MW 11.30	L9CL
E3 213N (E7 202)	2:1	Microelectronics MS	MW 12	L8CL
E3 231N (E6 206)	2:1	Design of Digital Systems NJR	TTh 12	L6CL
E3 235N (E6 214)	2:1	Analog & Data Conversion Systems CR/MKG	TTh 2	L8CL
E3 241N (New)	2:0	Communication Electronics MVS/APS	MW 12	L11CL
E3 151N (New)	2:1	Electronic Measurements and Instrumentation BSS/DKA	MW 8	L4CL
E3 152N (E6 111)	2:1	Introduction to Micro-processors & Applications JMK	TTh 9	L6CL
E3 255N (E3 254)	2:1	Microcomputer System Design - II MKK/HSJ	TTh 9	L7CL
E3 263N (E6 218)	2:1	Physical Design of Electronic Equipment NVC	TTh 12	L7CL
E3 264N (E6 219)	2:1	Industrial Design of Electronic Equipment PY	M 9-11	EC107

(1)	(2)	(3)	(4)	(5)
E4 101N (New)	3:1	Principles of Electrical Engineering DPS/PSN/IS/MN/MCS/KRP	MWF 10	L4CL
E4 102N (E5 114 & E5 114A)	2:1	Basic Electrical Engg MCS	TTh 11	L6CL
E4 104N (E5 103)	2:0	Electromechanical Energy Conversion II PSN	TTh 10	L12CL
E4 106N (E5 111)	0:1	Electrical Lab - II BSRI	M 2	Lab
E4 107N (IN 111)	2:1	Electrical Measurements and Instruments SS	F 8-10	L6CL
E4 201N (E5 210)	2:0	Solid State Excitation Systems BSRI	MW 11	L8CL
E4 202N (E5 209)	2:0	Dynamics of Electrical Machines DPS	TTh 9	L8CL
E4 211N (E5 276)	2:0	D C Transmission Systems KRP	TTh 10	L8CL
E4 131N (E5 106)	3:0	Power Systems - I BSRI	TTh 11-12.30	PE303
E4 234N (E5 208)	2:1	Advanced Computer Aided Power Systems Analysis DPS	MTh 9	PE303
E4 242N (E5 279)	2:0	Static Var Systems KRP	MW 12	L12CL

(1)	(2)	(3)	(4)	(5)
E5 201N (E5 221)	2:0	Production & Measurement of High Voltages BRP	TTh 11	HV205
E5 202N (E5 241)	0:1	High Voltage Lab - I BRP	F 2	HV
E5 211N (E5 222)	2:0	Power Transformers HSC	MT 10	HV205
E5 212N (E5 225)	2:0	High Voltage Switchgear HSC	T 8-10	HV205
E5 221N (E5 230)	2:0	Physics of Dielectrics TSR	WF 10	HV205
E5 222N (E5 231)	2:0	Insulation Engineering MNN/RSN	MW 11	HV205
E5 226N (E5 262)	2:0	Collision Phenomena and Plasma Science MSN/RSN	WF 12	HV205
E6 101N (E6 104)	3:0	Electronic Circuits (Power Control) SKS	TTh 9-10.30	L11CL
E6 201N (E6 202)	3:1	Power Electronics VR	TThF 10	PE218
E6 202N (E6 217)	2:1	Designing with Power Devices SRB	MW 12	EC107
E7 101N (E7 102)	2:0	Photonic Devices AS	MW 2	L5CL
E7 221N (E2 206)	2:1	Optical Communication AS	WF 9	L8CL

(1)	(2)	(3)	(4)	(5)
E8 202N (E5 250)	3:0	Electromagnetism GRN	TTh 9-10.30	HV205
E8 205N (New)	3:0	High Frequency Techniques in Scattering RPS	MWF 9	L5CL
E8 121N (E8 102)	2:1	Microwave Techniques AK	TTh 8	L7CL
E8 221N (E8 203)	3:0	Microwave Devices TSV	MWF 10	L7CL
E9 201N (E9 202)	3:0	Digital Signal Processing KRR/DND	MWF 12	L6CL
E9 212N (E9 204)	2:1	Modern Spectrum Analysis PSN	MW 9	L11CL
E9 221N (New)	3:0	Digital Signal Compression TVS/AM	MW 11-12.30	L7CL
E9 232N (E9 220)	3:0	Adaptive Arrays VUR/RPS	MW 9-10.30	EC108
E9 241N (E9 205)	2:1	Digital Image Processing KRR/YVV	MW 3	L8CL
E9 242N (E9 214)	3:0	Selected Topics in Image Processing KRR/YVV	TTh 11-12.30	PE303
E9 261N (E9 210)	3:0	Speech Information Processing TVS	TTh 9-10.30	EC108
E9 271N (E1 203)	2:1	Bio-Instrumentation ISNM	MW 2	PE302
E9 381N (E9 301)	1:2	Remote Sensing YVV/AS/AK	F 2	L12CL

(1)	(2)	(3)	(4)		(5)
		DIVISION OF MECHANICAL SCIENCES			
AE 201	2:0	Mechanics of Flight GNVR	TTh	9	AE105
AE 203	3:0	Fluid Dynamics AP	MWF	11	AE105
AE 205	2:0	Missile Aerodynamics VSH	TTh	2	AE106
AE 221	3:0	Structural Mechanics KV/AVK	MWF	9	AE105
AE 226	2:0	Aeroelasticity(Aircraft) SD	WF	10	AE102
AE 241	2:0	Fundamentals of Combustion BNR	TTh	12	AE105
AE 244	2:0	Liquid Propellant Rockets PJP	MW	2	AE
AE 245	3:0	Mechanics and Thermo-dynamics of Propulsion HSM	MWF	2	AE105
AE 249	3:0	Introduction to Acous-tics - I TSS	MWF	3	AE106
AE 259	2:0	Navigation, Guidance and Control NB/MSB/DG	TTh	11	AE105
AE 260	3:0	Digital Control of Aero-space Systems MSB	MWF	2	AE106

(1)	(2)	(3)	(4)		(5)
AE 261	3:0	Aircraft Flight Control Systems			
		MSB	T	10	AE105
AE 272	1:2	Flight Vehicle Design	Th	10	AE105
		Design Staff	TTh	2	
AE 273	1:2	Rocket and Spacecraft Design			
		Design Staff	Th	10	AE105
			TTh	2	
AE 277	0:2	Experimental Structures			
		FM	MW	2	AE
AE 301	2:0	Mathematical Methods in Reacting Flows			
		PJP	MW	12	AE
AE 302	3:0	State and Parameter Estimation Techniques in Aerospace Engg			
		MRA	TThF	12	AE
AE 313	2:0	Computational Aerodynamics			
		SMD	MW	3	AE106
AE 317	3:0	Transanic Aerodynamics			
		MAR	MWF	2	AE104
AS 201	2:0	Introduction to Meteorology			
		MSR	MF	3	CAS
AS 202	3:0	Geophysical Fluid Dynamics	TTh	3-4.30	CAS
		SG/BNG			
AS 203	2:0	Physical Meteorology			
		JS/GSB	MTh	2	CAS
AS 204	3:0	General Circulation and Climate	TTh	10-11.30	CAS
		BNG/MSR			

(1)	(2)	(3)	(4)		(5)
CE 201	3:0	Basic Geomechanics AS	TThF	9	GTH
CE 202	1:2	Experimental Soil Mechanics NSP	F	2	CEL2
CE 203	2:0	Earth and Earth Retaining Structures KSS	TTh	10	GTH
CE 204	2:0	Foundation Engineering MMA	TTh	11	GTH
CE 214	2:0	Fundamentals of Soil Behaviour MSR	MW	9	GTH
CE 216	2:0	Prediction of Soil Behaviour BRS/TSN	MW	2	GTH
CE 223	2:0	Soil Stabilization FM	TTh	2	GTH
CE 231	3:0	Fluid Mechanics FM	MWF	9	CEL1
CE 232	3:0	Water Conveyance System ARR	TTh	10	CEL1
CE 233	2:0	Surface Water Hydrology MSM	MF	11	CEL1
CE 234	2:0	Ground Water Hydrology RP	MW	10	CEL1
CE 235	2:0	Systems Techniques in Water Resources SV	TTh	11	CEL1

(1)	(2)	(3)	(4)		(5)
CE 243	3:0	Hydraulics of Erodible Channels ARR	MWF	2	CEL1
CE 247	3:0	Boundary Layer Flows KVNS	TTh	2-3.30	CEL1
CE 253	2:0	Pumps & Pumping Systems HSG	MW	12	CEL1
CE 256	2:1	Electronic Instrumentation RS	MW	8	CEL2
CE 261	2:0	Matrix Analysis of Structures KSJ	MW	3	CEL2
CE 262	2:0	Theory of Plates and Shells KC	TTh	11	CEL2
CE 263	3:0	Structrual Dynamics BKR	MWF	9	CEL2
CE 264	2:0	Applied Elasticity PCP	TTh	9	CEL2
CE 265	3:0	Limit State Design of Concrete Structures PD	MWF	10	CEL2
CE 281	2:0	Nonlinear Vibrations and Chaos RNI	MW	11	CEL2
CE 283	2:0	Computational Plasticity PCP	TTh	12	CEL2
CH 201	3:0	Advanced Topics in Heat and Mass Transfer KKR/MSM	MWF	10	CH

(1)	(2)	(3)	(4)	(5)
CH 202	3:0	Computer Oriented Numerical Analysis MC/DNS	MWF 2	CH
CH 203	3:0	Applied Thermodynamics AKM/TRD	TTh 2-3.30	CH
CH 204	3:0	Advanced Topics in Momentum Transfer KSG/NVSS	TThF 9	CH
CH 231	2:0	Analysis of Chemical Reactors SSL	TTh 12	CH
CH 232	3:0	Chemical Engineering Mathematics VGK	MWF 12	CH
CH 233	3:0	Biomedical Engineering VGK	MWF 9	CH
CH 234	2:0	Environmental Engineering MR/MSM/SSL/RK/MC	MW 2	CH
CH 235	3:0	Energy Engineering AKM	MWF 8	CH
CH 236	3:0	Biochemical Engineering NVSS	MWF 3	CH
CH 254	1:1	Modern Instruments Methods JRM	M 10	CH
ME 101	2:1	Introduction to Transport Processes JHA	MW 10	ICE
ME 111	1:1	Measurements and Instruments RH	F 10	ME

(1)	(2)	(3)	(4)	(5)
ME 131	2:1	Introduction to Computer Programming RH/AGM	TTh 8	ME
ME 137	3:1	Kinematics and Dynamics of Machinery PRA	MWF 8	ME
ME 201	3:0	Fluid Mechanics VHA	MWF 10	ME208A
ME 221	2:0	Science of Metal Casting SS	WF 12	ME208A
ME 228	3:0	Materials and Structure Property Correlation BNP	WTh 3-4.30	ME
ME 229	3:0	Mechanical Behaviour of Engineering Materials FM	MWF 12	ME
ME 242	3:0	Solid Mechanics KRYS	MWF 9	ICE
ME 243	3:0	Theory of Plasticity SKB	TTh 11-12.30	ME
ME 246	3:0	Introduction to Robotics AG	TTh 8-30 10	ICE
ME 247	3:0	Dynamics of Machinery US	*	*
ME 250	2:1	Design of Engineering Systems TSM	TTh 10	ME208A

*Arranged by the Instructor

(1)	(2)	(3)	(4)	(5)
ME 254	2:1	Fluid Power Control Systems SNR	MW 8	ME
ME 255	3:0	Principles of Tribology NR	MWF 2	ME
ME 256	2:0	Wear of Materials BNP	WF 2	ME
ME 257	3:0	Finite Element Methods US	TTh 2-3.30	ME
ME 271	3:0	Thermodynamics VHA	MWF 11	ME208A
ME 277	3:0	Heat Exchanger Design JS	MWF 10	HTLAB
ME 287	3:0	Refrigeration Engineering MVK	*	*
ME 290	3:0	Steam Power Plants JS	MW 4-5.30	ME
ME 293	3:0	Fracture Mechanics KRYS	TTh 4-5.30	ME
ME 296	2;0	Computer Aided form design of Moulded Components MNS	MW 2	ME
ME 297	2:0	Contact Mechanics SKB	TTh 2	ME
ME 302	3:0	Bubble Dynamics and Cavitation VHA	MW 4-5.30	ME

*arranged by the Instructor

(1)	(2)	(3)	(4)	(5)
ME 311	3:0	Advanced Ferrous Foundry Metallurgy MRS/SS	TTh 4-5.30	ME
ME 312	3:0	Advanced Non-Ferrous Foundry Metallurgy MNS/KSS	MWF 12	ME
ME 323	2:0	I C Engine Processes III MVN	*	*
ME 324	2:0	I C Engine Systems MVN	*	*
ME 327	3:0	Computational Heat Transfer and Fluid Flow MVK	*	*
ME 329	3:0	Measurement in Heat Transfer MVK	*	*
ME 330	3:0	Advanced Topics in Heat Transfer MVK	*	*
MG 201	2:0	Principles of Management VSS	MW 11	MG
MG 211	3:0	Behavioural Sciences VSS/KBA	TThF 12	MG
MG 216	2:0	Organizational Behaviour KBA	TW 9	MG
MG 223	2:0	Economics for Management NS	TTh 10	MG
MG 228	2:0	Transport Management FM	TTh 10	MG

*Arranged by the Instructor

(1)	(2)	(3)	(4)	(5)
MG 232	2:0	Management Accounting ORK	W 2-4	MG
MG 251	2:0	Operations Management FM	TTh 11	MG
MG 261	3:0	Computers for Management FM	MWF 10	MG
MG 265	2:0	Finite Mathematics FM	WF 2	MG
MG 311	2:0	Advanced Human Resources Management FM	Th 3-5	MG
MG 390	2:0	Methodology of Management Research FM	TTh 2	MG
MT 101	0:1	Process Calculation BVN	F 2	MT201
MT 102	2:0	Mass, Heat and Momentum Transfer AKL	TTh 11	MT251
MT 103	2:1	Ore Dressing SS	WF 11	MT251
MT 107	3:0	Phase Stability VJ	MWF 12	MT201
MT 109	2:0	Deformation and Fracture of Engg Materials FM	MW 10	MT201
MT 112	2:0	Metal Joining KSR	TTh 9	MT201
MT 115	2:0	Pyrometallurgy JPH	MWF 11	MT201

(1)	(2)	(3)	(4)	(5)
MT 117	3:0	Iron & Steel Making GNKI	MWF 2	MT201
MT 118	2:1	Thermodynamics of Materials MVB	MW 10	MT251
MT 206	3:0	Corrosion Engineering KAN	MTTh 11	MT251
MT 207	2:0	Phase Transformations KC	MWF 9	MT251
MT 208	3:0	Solidification Processing MKS	TF 3-4.30	MT251
MT 209	2:1	Deformation Processing YVRKP	TTh 9	MT251
MT 210	2:0	Mechanical Properties of Material DHS	TTh 2	MT201
MT 214	2:1	Powder Metallurgy of High Performance Materials RMM	TThF 12	MT251
MT 217	2:1	Diffraction Techniques DHS	TTh 10	MT201
MT 219	2:0	Composite Materials Kishore	TTh 10	MT251
MT 221	2:0	Powder Metallurgy SR/MKS	MW 9	MT201
MT 222	2:0	Electron Diffraction & Microscopy VJ	MW 3	MT251

(1)	(2)	(3)	(4)	(5)
MT 301	3:0	Advanced Thermodynamics of Materials KTJ	TTh	2-3.30 MT

(1)	(2)	(3)	(4)	(5)

DIVISION OF MATHEMATICAL AND PHYSICAL SCIENCES

FL 141	3:0	Preliminary Course in Russian			
		FM	MWF	2	FL
FL 201	2:0	Communication Skills for Scientists & Engineers			
		SJS/TC	TTh	2	FL
FL 221	3:0	Basic Translation Course in Science German			
		RL	MWF	3	FL
FL 241	3:0	Basic Translation Course in Russian			
		FM	TTh	2-3.30	FL
IS 203	2:0	Computational Methods in Engineering			
		MC	MW	2	ISU
IS 213	0:2	Analog & Digital Lab			
		CNM/LS	TTh	2	LAB
IS 221	2:1	Sensors & Signal Conditioning			
		MVL/VCV/CNM	MW	10	ISU
IS 222	2:1	Microprocessors and Interfacing Techniques			
		SR/VCV/VN	TTh	10	ISU
IS 233	2:0	Thin Film Devices and Applications			
		KNR/SM	TTh	8	ISU
IS 234	2:1	Theory & Practice of Vacuum Technology			
		SM/KNR/LS	MW	9	ISU

(1)	(2)	(3)	(4)		(5)
IS 241	2:0	Lasers & Applications RMV	MW	8	ISU
IS 244	2:1	Theory & Practice of Optical Instrument Technology BSR/TSR	TTh	9	ISU
IS 252	2:0	Instrumentation for Energy Conservation and Management MVK	TTh	11	ISU
IS 254	3:0	Precision Engg and Fine Mechanics MVK/MC	MWF	11	ISU
IS 341	2:0	Topics in Coherent and Non coherent Optical Processing RMV	MW	10	*
MA 121	3:0	Functions of Several Variables AVG	MWF	9	L4CL
MA 211	3:0	Linear Algebra RVR	MWF	11	L1CL
MA 212	3:0	Discrete Structures RR	MWF	9	L7CL
MA 221	2:0	Integral Transforms and Applications AVG	TTh	9	L1CL
MA 247	3:0	Mathematical Methods PLS	MWF	12	L1CL

(1)	(2)	(3)	(4)	(5)
MA 251	3:0	Numerical Analysis PP	MWF 10	L1CL
MA 261	3:0	Probability and Statistics VGT	MWF 9	L1CL
PH 201	2:0	Classical Mechanics HRK	MW 2	PH
PH 203	3:0	Quantum Mechanics - I RR	MWF 9	PH
PH 205	3:0	Mathematical Methods of Physics DS	TTh 2-3.30	PH
PH 207	3:0	Analog, Digital and Microprocessor Electronics JR	MWF 10	ISU
PH 209	0:3	Analog & Digital Electronics KSS/KR	MWF 2	Lab
PH 211	0:2	General Physics Lab AKR/AKS/SR	TTh 2	Lab
PH 221	3:0	Analog, Digital and Microprocessor Systems ESR/KSS/KR/	MWF 10	PH
PH 301	1:0	Seminar Course CD/AKR	Th 4	PH
PH 315	3:0	Advanced Mathematical Methods of Physics RP	TTh 11-12.30	PH
PH 325	3:0	Advanced Statistical Physics JP	MWF 2	CTS

(1)	(2)	(3)	(4)		(5)
PH 345	2:0	High Pressure Physics SVS	MW	10	PH
PH 347	2:0	Analysis of Nucleic Acid and Protein Sequences and Structures RK/MB	TTh	11	PH
AA 360	2:0	Survey of Astronomy RN(RRI)	MW	12	RBL
AA 362	2:0	Radiative Processes in Astrophysics ARC/DB(RRI)	TTh	12	RBL
AA 363	2:0	Dynamical Processes in Astrophysics VK(IIA)	MW	11	RBL
AA 375	2:0	Astronomical Techniques FM	TTh	11	RBL
TI 201	3:0	Numerical Analysis FM	MWF	3	TIFR
TI 301	3:0	Analysis FM	TTh	3-4.30	TIFR

INDIAN INSTITUTE OF SCIENCE

TIME TABLE.
AUGUST-DECEMBER 1991

	8	9	10	11	12	1	2	3	4
M									
Tu									
W									
Th									
F									

IISc: 100 Years and Beyond

The IISc Centenary Conference

December 13-16, 2008, IISc Campus, Bangalore, India

The Indian Institute of Science was established in 1909, giving shape to the extraordinary vision of Jamsetji Nusserwanji Tata. The Institute is an enduring symbol of the very best in Indian scientific research and has assiduously maintained the highest standards of academic excellence, matching the best in the world.

The IISc Centenary Conference will be a memorable event, organized during December 13-16, 2008, to mark 100 illustrious years in science, technology, and innovation. It will be marked by several important events focusing on the Institute's contributions to fundamental and applied scientific research, its role in creating and nurturing scientific institutions, its place as a rich source of talented scientific manpower, and its future role in the Indian society with major aspirations to take its rightful place in the global order. The event will also sparkle with the reunion of IISc's alumni from all over the globe.

Program Highlights

INAUGURATION

December 13, 2008, Saturday 3.00 - 5.30 P.M.
The conference will be formally inaugurated with keynote talks by

C.N.R. Rao
Chairman, SAC-PM and National Research Professor

A.P.J. Abdul Kalam
Former President of India and Bharat Ratna

CONFERENCE KEYNOTE TALKS

There will be a string of keynote talks by world class researchers, public luminaries, and industry leaders during the three days.

December 14, 2008 Sunday

Martin Rees
President, Royal Society, London, UK

S. Ramadorai
CEO and MD, Tata Consulting Services

Subra Suresh
Dean of Engineering, MIT, Cambridge, MA, USA

Desmond Tutu, Archbishop Emeritus of Cape Town, South Africa and Nobel Laureate in Peace, 1984

December 15, 2008 Monday

Sydney Brenner
Molecular Sciences Institute, King's College, Cambridge, UK & Nobel Laureate in Medicine/Physiology, 2001

Arcot Ramachandran
Chairman, Tata Energy Research Institute, New Delhi

Sam Pitroda
Chairman, Knowledge Commission, New Delhi

December 16, 2008 Tuesday

Kiran Mazumdar Shaw
Chairman and Managing Director, Biocon India

Eric S. Maskin
Centre for Advanced Study, Princeton, NJ, USA and Nobel Laureate in Economic Sciences, 2007

PANEL SESSIONS

There will be three panel sessions on important contemporary topics.

The panel sessions are coordinated by **G. Rangarajan,** IISc

PANEL SESSION 1: December 14, 2008 Sunday

"India - A Knowledge Power: Opportunities and Challenges"

Chair: **Goverdhan Mehta,** CSIR Bhatnagar Fellow, IISc

Panelists

Vijay Chandru, CEO, Strand Life Sciences, Bangalore

Ashok Jhunjhunwala, IIT-Madras, Chennai

Gretchen Kalonji, Director of International Strategy Development, Office of the President, University of California System

Manju Sharma, Former Secretary, Dept. of Biotechnology

K. R. Sreenivasan, Director, International Centre for Theoretical Physics, Trieste, Italy

Kentero Toyama, Microsoft Research India, Bangalore

PANEL SESSION 2: December 15, 2008 Monday

"Climate Change - An Indian Perspective"

Chair: **J. Srinivasan,** IISc

Panelists

Timothy Fridtjof Flannery, Chairman, Copenhagen Climate Council

Madhav Gadgil, Agharkar Research Institute, Pune

Sunita Narain, Director, Centre for Science and Environment, New Delhi

Anand Patwardhan, IIT Bombay, Mumbai

Shyam Saran, Special Envoy of the Prime Minister, GOI, New Delhi

PANEL SESSION 3: December 16, 2008 Tuesday

"Rediscovering IISc for the 21st Century"

Chair: **N. Balakrishnan,** Associate Director, IISc

Panelists

D. Balasubramanian, Director of Research, L.V. Prasad Eye Institute, Hyderabad

M.K. Bhan, Secretary, Department of Biotechnology, Govt. of India, New Delhi

S.K. Brahmachari, Director General, CSIR, New Delhi

R. Chidambaram, Principal Scientific Adviser, Govt. of India, New Delhi

Glyn Davis, Vice Chancellor, University of Melbourne, Melbourne, Australia

M. Natarajan, Scientific Adviser to Raksha Mantri, Govt. of India, New Delhi

T. Ramasami, Secretary, Department of Science and Technology, Govt. of India, New Delhi

Raj Reddy, Carnegie Mellon University, Pittsburg, PENN, USA

INTER-DISCIPLINARY WORKSHOPS

There will be multiple workshops on emerging inter-disciplinary themes. The workshops are coordinated by **Dipankar Chatterji** and **Rudra Pratap,** both from the Indian Institute of Science. The workshops will be held in parallel during 2.15 to 5.30 PM on December 14, 2008 (Sunday). The workshops include:

- **Micro and Nano Technologies** - Coordinators: **Navakant Bhat,** IISc and **S. Sampath,** IISc
- **Energy and Materials** - Coordinators: **Ganapathi Ayappa,** IISc and **Vikram Jayaram,** IISc
- **Integrative Biology** - Coordinators: **Dipankar Chatterji,** IISc and **K. Muniyappa,** IISc
- **Earth and Climate Sciences** - Coordinators: **Kusala Rajendran,** IISc and **R. Sukumar,** IISc
- **Intelligent Transportation** - Coordinators: **H.S. Jamadagni,** IISc and **S. Mohan,** IISc
- **Complex Systems and Networks** - Coordinators: **Anurag Kumar,** IISc and **Y. Narahari,** IISc
- **Sustainable Technologies & Technology Outreach** - Coordinators: **S. Dasappa,** IISc and **Monto S. Mani,** IISc

DIVISIONAL WORKSHOPS

There will be five workshops involving the five academic divisions of the Indian Institute of Science. The workshops will be held in parallel during 2.15 to 5.30 PM on December 15, 2008 (Monday). The workshops include:

- **Biological Sciences**
  Coordinator: **D.N. Rao,** IISc
- **Chemical Sciences**
  Coordinator: **S. Chandrasekaran,** IISc
- **Electrical Sciences**
  Coordinator: **Anurag Kumar,** IISc
- **Mechanical Sciences**
  Coordinator: **J. Srinivasan,** IISc
- **Physical and Mathematical Sciences**
  Coordinator: **Rahul Pandit,** IISc

SPECIAL EVENT ON "IISc: Past, Present, and Future"

This event will feature all the present and past directors, associate directors, and deputy directors of the Institute and will be coordinated by **M.L. Munjal,** IISc and **S. Chandrasekaran,** IISc.

IISc SHOWCASE

Individual departments and centres of the Institute will showcase the achievements and perspectives of IISc through posters and other display material at the conference venue.

The IISc Showcase will be on display during December 13-16, 2008.

ALUMNI DAY

December 13, 2008, Saturday, the first day of the conference will be celebrated as the Alumni Day. Alumni Events will be organized during the forenoon.

CULTURAL PROGRAMS

Two cultural programs will be held. The first of these would be on December 13, 2008 (Saturday) and will feature a Hindustani Santoor Recital by world renowned exponent Pandit Shivkumar Sharma.

The second cultural program will be held on December 15, 2008 (Monday) and will feature a Bharatanatyam Dance Recital by leading exponent Ms. Malavika Sarukkai.

PARTICIPATION OF EMINENT ALUMNI, ALUMNAE, AND EXPERTS

The inter-disciplinary workshops, divisional workshops, and all other events will utilize the expertise of leading scientists and technologists, and eminent alumni and alumnae, including:

- **V.K. Aatre,** Former Scientific Adviser to Raksha Mantri
- **J.J. Irani,** Director, Tata Sons
- **G. Madhavan Nair,** Chairman, Indian Space Research Organisation
- **R. Narasimha,** Former Director, National Aerospace Laboratories
- **G. Padmanaban,** Former Director, IISc
- **P. Rama Rao,** Former Secretary, Department of Science and Technology

Patrons

- C.N.R. Rao, Chairman, SAC-PM and National Research Professor
- K. Kasturirangan, Chairman, IISc Council
- P. Balaram, Director, IISc

Conference Chairs

- N. Balakrishnan, Associate Director, IISc (Chair)
- M.L. Munjal (Co-Chair)

Core Program Committee

- M.L. Munjal (Chair)
- S. Mohan (Co-Chair)
- V. Nagaraja (Convener)
- Rahul Pandit (Co-Convener)
- Y. Narahari (Co-Convener)

Core Organizing Committee

- S. Chandrasekaran (Chair)
- K. Chattopadhyay (Co-Chair)
- Y. Narahari (Convener)
- V. Nagaraja (Co-Convener)
- B.S. Rajanikanth (Co-Convener)

Alumni Coordination

- S. Mohan, Chairman, Alumni Cell, IISc
- B. Dattaguru, President, IISc Alumni Association
- Ramakrishna Akella, USA
- Parveen Jain, USA

Registration Information

Category	Early Bird Registration (Before Nov. 17, 2008)	Regular Registration (After Nov. 17, 2008)
Academics in India	Rs. 3000	Rs. 4000
Faculty, retired faculty, alumni and alumnae in India	Rs. 2000	Rs. 2500
Industry Delegates from India	Rs. 8000	Rs. 10000
Delegates from Abroad	USD 300	USD 400

Spouses accompanying delegates are required to pay 50 percent of the registration fee applicable to delegates. Banker's cheque / DD drawn in favour of "The IISc Centenary Conference" payable at Bangalore is accepted along with filled in registration form available on the website.

Contact Information

Conference Secretariat
The IISc Centenary Conference
Bungalow No. 12 (The Alumni Cell Office)
Indian Institute of Science, Bangalore – 560 012

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Email: centenary-conf@admin.iisc.ernet.in
URL: www.iisc.ernet.in/centenary-conf

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