



Admissions

to

**POSTGRADUATE
PROGRAMMES**

M.TECH./ M.ARCH./ M.U.R.P.

INFORMATION BROCHURE

2017-18

**INDIAN INSTITUTE OF TECHNOLOGY ROORKEE
ROORKEE - 247 667**



Indian Institute of Technology Roorkee

Postgraduate Admission-2017

INFORMATION BROCHURE (M.Tech./M.Arch./M.U.R.P.)

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IMPORTANT DATES

Events	Dates
GATE Result will be announced	March 27, 2017 (Monday)
Online Application Process (Open)	March 28, 2017 (Tuesday)
Last Date for Applying Online and Deposit of fee	April 18, 2017 (Tuesday)
Last date for receiving of downloaded Application with relevant documents at PG Admission Office, IIT Roorkee	April 21, 2017 (Friday)
Last date for uploading of call letters for Interview/Written Test and/ or Counselling	May 09, 2017 (Tuesday)
Medical Examination for Persons with Different Abilities (PD) Candidates by the Medical Board	May 30, 2017 (Tuesday)
Interview/Written Test	May 31, 2017 (Wednesday)
Announcement of merit list after interview/written test	June 01, 2017 (Thursday night)
Counselling for admission	June 01-03, 2017 (Thu-Sat)
Date of Registration	July 13, 2017 (Thursday)
Classes Begin	July 17, 2017 (Monday)
List of vacant position uploaded on Institute Website	July 17, 2017 (Monday)
<i>Final Counselling cum Registration of the Waitlisted Candidates in Merit for the vacant seats, if any</i>	July 24, 2017 (Monday)
Close of Admission	July 24, 2017 (Monday)

Note:

1. Institute fee/Waitlisted amount is to be deposited at the time of Counselling.
2. The vacancies created after 1st round of counseling will be filled by waitlisted candidates till the date of registration.

IMPORTANT INSTRUCTIONS

1. The candidates are advised to read each and every instruction given in this Information Brochure very carefully before applying Online.
2. Application **found incomplete or received after the last date** i.e. **April 21, 2017, may be rejected** without any intimation to the candidate and no correspondence will be entertained in this regard.
3. Paste your colored photograph having good contrast, within the box only, on the Downloaded Application. Photograph must NOT be attested. Put your **signature using BLACK (INK OR BALL POINT) PEN only** within the blocks provided **on the Application**.
4. Candidates may seek admission to more than one department (maximum four departments and 14 programmes). **A candidate should submit one Application only.**

Application Fee: Rs. 400/- for General/OBC category and Rs. 200/- (for SC/ST/PD category candidate plus Rs.100/- per additional number of Departments applied. For example GEN/OBC candidate applying for 3 departments required to pay Rs. 600/- and SC/ST/PD Rs. 400/- depending on their category). The candidates can deposit the requisite application fee by using net banking or debit/credit card facilities.

The Fee will not be accepted through any other mode.

5. Choices (max. 14) once given shall not be changed for any reason after submission of Online application form).
6. After submitting the Application, all enquiries be made to the PG Admission Office, IIT Roorkee only.
7. **For further information, please contact:**

Contact	Telephone and Fax Nos.
PG Admissions Office Indian Institute of Technology Roorkee, ROORKEE-247 667 (Uttarakhand)	(01332) 284010 (Tel.) (01332) 285875 (Tel.) (01332) 285874/273560 (Fax)
www.iitr.ac.in or http://pgadm.iitr.ernet.in	e.mail: pgadm@iitr.ac.in

1. THE INSTITUTE

Indian Institute of Technology Roorkee has its roots in the Roorkee College established in 1847 as the first engineering college in India, which was soon rechristened as Thomason College of Civil Engineering in 1854 after its greatest mentor James Thomason. After about 100 years of distinguished services, the college was elevated to University of Roorkee as the first Engineering University of independent India on November 25, 1949. It was converted to IIT on September 21, 2001. It has now 26 academic departments/centres offering undergraduate courses in engineering and architecture, dual degree programmes and Integrated Dual Degree courses in M.Sc./Engineering and around 48 postgraduate courses in engineering, architecture, sciences, computer science & Engineering and business administration besides research programmes at doctoral level. It has three campuses, main campus at Roorkee and other two at Saharanpur and Greater Noida

IIT Roorkee has a highly qualified and motivated faculty of about 430 members who are engaged in research and consultancy in addition to teaching. The faculty members offer their expertise through consultancy services to private/public sector industries as well as to Government agencies. The institute has about 4289 undergraduate students, 1850 postgraduates and over 1750 research scholars.

There are a number of academic and research centres engaged in interdisciplinary research, and many collaborative programmes exist with institutions in India and abroad. Several central facilities of the Institute include Mahatma Gandhi Central Library having more than 3.65 lac volumes of books and periodicals, Information Superhighway Centre with Internet connectivity, an Educational Multi-Media Research Centre with full-fledged television studio, a modern Computer Centre and Institute Instrumentation Centre with highly sophisticated analytical instruments.

The Institute prepares students to meet ever-increasing technological and social challenges with its traditions of self-discipline, hard work, all-round personality development and innovative approach to problem solving.

IIT Roorkee is fully residential, with well-designed hostels (Bhawans) both for boys and girls, sprawling sports grounds, hobbies club, hospital, a modern swimming pool, boat club and a host of facilities for different games including Tennis, Squash and Billiards. Societies and Associations along with activities like NCC, Ranging and Rovering, Mountaineering and Trekking provide excellent opportunities for self-development.

2. ROORKEE TOWN

Roorkee, a quiet town of moderate size in the district of Hardwar (Uttarakhand), is located on the banks of the Upper Ganga Canal, which takes off at Hardwar. It is about 30 km south of the Shivalik range of the mighty Himalayas, about 175 km to the north of Delhi and is situated on the Amritsar-Howrah main railway line. Roorkee is linked by rail to many important cities such as Delhi, Kolkata, Chennai and Mumbai. Roorkee is also well connected by road, being located on the Delhi-Hardwar National Highway (NH 58), and on the Roorkee – Panch Kula Highway (NH 73). Roorkee (Latitude 29° 52' N and Longitude 77° 53' 52" E) is 268 m above mean sea level and has a cold winter. The summer months, though hot, are moderated by the proximity of the Shivaliks. The rainy season is mainly between July and September with an average rainfall of 1050 mm.

Roorkee town is an important centre of engineering activity. Apart from the IIT Roorkee, which is situated in a 150-hectare campus, Roorkee also has the Central Building Research Institute, the National Institute of Hydrology, the Irrigation Research Institute, the Irrigation Design Organization, the headquarters of Bengal Engineering Group & Centre along with an important Army base.

The Institute campus is 2.5 km from the Roorkee Railway Station and is only 200 m from the Roadways Bus Stand.

3. ACADEMIC DEPARTMENTS/CENTRES

Alternate Hydro Energy Centre (AHEC)

Alternate Hydro Energy Centre (AHEC), an academic centre, was established at Indian Institute of Technology Roorkee in Year 1982 to impart education, training and carry out research in the area of power generation through the development of small hydro power in conjunction with other renewable energy sources as well environmental management of water bodies. AHEC offers two M.Tech programmes.

The M.Tech programme in “*Alternate Hydro Energy Systems*” offered since 1997, provides basic and practical knowledge on various aspects of small Hydro Power and other renewable energy like solar, biomass, wind etc and covers planning, investigations, design, selection of hydro-mechanical and electrical equipment, power evacuation, integration with grid, operation and maintenance. The development of integrated renewable/hybrid power systems and smart grid is also covered, specially, for rural electrification.

The second M.Tech programme in “*Environmental Management of Rivers and Lakes*” (formerly Conservation of Rivers and Lakes) started in 2004 was sponsored initially by Ministry of Environment, Forest and Climate Change (MOEFCC), Govt. of India for capacity building of the personnel from state, local, central government and private sector organizations dealing with the conservation, restoration and maintenance of water bodies. Since 2010, the programme is opened for GATE qualified candidates. The programme is focussed for the elimination and control of pollution of rivers and lakes caused due to anthropogenic activities in the catchment like rapid urbanisation and industrialisation and is the focus of various schemes of Govt. of India.

Both programme also admits foreign students under ITEC programme of Ministry of External Affairs, Govt. of India. Two institute elective are offered by AHEC to UG students in each semester. Ph.D. programmes are also available in the above areas.

AHEC is also well known nationally and internationally for its vibrant and dynamic participation and provides expert services to various govt./private organizations in the area of SHP & other renewable energy sources as well environmental management of rivers & lakes.

Architecture and Planning

The department of Architecture and Planning imparts high quality education in the professional fields of Architecture and Planning and offers Bachelor of Architecture (B. Arch.), Master of Architecture (M. Arch.), Master of Urban and Rural Planning (MURP) and Ph.D. programmes. The B.Arch. programme started in 1956. The department has singular distinction of being the first in India in instituting a Masters Degree program M. Arch. in the year 1969-70 and later MURP in 1973-74. Students with degree in Architecture can pursue M. Arch. Programme, whereas the MURP programme is offered to

students with bachelor degree in Architecture, Planning and Civil Engineering. The department has facilities like Climatology Lab, Computer Lab and Computerized Design Studios equipped with the state-of-art equipment and software, Photography Lab, Applied Art Lab and a Workshop for hands-on activities and creative exercises. The department has a fully furnished Library with more than 4,000 books, upgraded studios with the improved design equipment at par to international standard. It also has a construction yard, Building Materials Lab, and a landscaped lawn for interactive sessions and events. The entire department is Wi-Fi enabled.

With a committed and well qualified faculty involved in crucial research and approved courses, the department continues to be marked as a keystone of architectural and planning education and research globally. It nurtures an interdisciplinary culture of intense academic and research based interactions, and aims at producing state-of-the-art professionals capable of contributing towards the development of sustainable habitat.

The department has specialization in research areas such as: Architectural History, Architectural Design, Institutional Architecture, Urban Design, Urban Environment Design, Sustainable Urban Form, Universal Design, Design Pedagogy, Culturally Responsive Built Environments, Applied Art, Aesthetics Architecture, Industrial Design, Visual Communication and Design, Vernacular Architecture, Hill Settlements, Energy Efficiency in Buildings, Sustainability in Built Environment, Passive Design, Thermal Comfort, Energy Efficiency and Carbon Foot Print of Built Environment, Energy Conservation in Buildings, Architectural Acoustics and Illumination, Building Information Modeling and Simulation, Life Cycle Analysis, Housing, Low Cost and Affordable Housing, Slums and Informal Settlements, Industrialised Building Systems (IBS), Culture Based Planning, Participatory Planning, Urban Dynamics, Financial Management, Resource Management, Inclusive Growth, Futuristic City, Smart City, Creative Industry & Knowledge Economy, Urban Risk & Disaster Mitigation, Resilience, and Governance.

Biotechnology

The Department of Biotechnology was established in the year 1981. It currently runs four years B.Tech. (Biotechnology) program, a two years M.Sc. (Biotechnology) program and an M.Tech. + Ph.D dual degree program in Bioprocess Engineering. The department also offers direct admission into its Ph.D. program in various frontiers areas of Biotechnology and Biochemical Engineering/Bioprocess Engineering/Chemical Engineering fields.

M.Tech + Ph.D. dual degree in Bioprocess Engineering will be admitted first in regular two years M.Tech (Bioprocess Engineering) program and subsequently if a student is willing and found eligible, based on CGPA etc are elevated to the Ph.D. program. Other students are only offered M.Tech (Bioprocess Engineering) degree.

M.Tech + Ph.D. (Bioprocess Engineering) dual degree program is a highly professional program and is highly specific to cater to the need of bioprocess industries. The bioprocess market has very high demand for these professionals. The engineering professionals having all basic process industry skills will be imparted with bioprocess skills so that they can cater to the needs of bioprocess industries. We strongly hope

they will be absorbed in Bioprocess Industries, Biofuel industries, Biofertilizer companies, pharmaceutical basic bulk drug manufacturing units, therapeutics and vaccine development companies, food processing industries and fermentation industries. They will have all engineering skills like heat and mass transfer, bioprocess control strategies, instrumentation, thermodynamics, process plant design, process equipment design, process economics, bioreaction engineering, bioreactor design and operation, process simulation, unit processes, downstream and bioprocess engineering etc with specialized skill of bioprocessing and biorefineries. They will also have fundamental knowledge in frontiers areas of modern biological sciences like microbiology, biochemistry, cell biology, molecular biology and genetic engineering etc. Their skills may be exploited for manufacturing of enzymes, proteins, basic bulk drugs, therapeutics, vaccines, fermented food products, food processing, biopesticides, biofuels in industrial scale. Students will also gain specific skills to better orient themselves for further research and academic program. **Overall, students in the Bioprocess Engineering focus area will obtain a thorough understanding of life based industrial processes from early-stage development through large-scale manufacturing.**

Career Options in Bioprocess Engineering: Process Development, Manufacturing Operations, Quality Assurance/Compliance, Regulatory Affairs (cGMP), Project Management, Environmental Remediation, Food Technology, Therapeutic Stem Cells Development, Manufacture of Gene Therapy Vectors, Vaccines Development, Production of Renewable Biofuels, New Enterprise Development, biopharmaceutical processes.

Chemical Engineering

The Department of Chemical Engineering imparts knowledge to students at the undergraduate and postgraduate level leading to B.Tech. and M.Tech. degrees in Chemical Engineering. M.Tech. programmes are offered in two specialized areas, namely, Computer Aided Process Plant Design (CAPPD) and Industrial Pollution Abatement (IPA). The Department also runs an Integrated Dual Degree Programme {B.Tech. (Chemical Engg) plus M.Tech. (CAPPD and IPA)}. The Department also admits students for Ph.D. programme.

The Department has well equipped laboratory facilities with state-of-art equipments and instruments. New Research laboratories have been established in Pollution Abatement, Hydrocarbon Testing, High Performance Computation and Instrumentation Analysis. The Department is well recognized for its industrial academic programmes and fundamental and applied research. The research output of the department in terms of published articles in peer reviewed research journals and industrial consultancy projects is formidable and noteworthy. The Department conducts a large number of continuing education and training programmes for sponsored candidates from industries in the emerging areas of Chemical Engineering.

Chemistry

Department of Chemistry was established in the year 1960 and has completed 55 years of its evolution in 2015 maintaining the highest level of academic standards. This department has

played an important role in science and scientific endeavours of IIT Roorkee and has remained an integral part of the institute since its inception. Its distinguished faculty members provide an environment, where the students of B.Tech., M.Tech., M. Sc. and Ph.D. programs learn, explore and discover new chemistry. General areas covered include Analytical, Inorganic, Organic and Physical Chemistry. The department offers M.Sc. (2 years), M.Tech. (Advanced Methods of Chemical Analysis) and Ph.D. programs in Chemistry. The faculty members of this department are also involved in interdisciplinary research in the areas of Environmental Science and Nanotechnology. This department is aiming to be one of the major centers of teaching and research in Chemical Sciences in India.

The department is equipped with the major facilities like: 400 MHz NMR, ESI-Mass Spectrophotometer, Elemental Analyzer, AAS, GC-MS, LC-MS/MS, Raman Spectrophotometer, Vibrating sample magnetometer, Rheometer, Surface Area Analyzer and Microwave Synthesizer. In addition to this, other facilities like UV-Visible Spectrophotometer, Infra-red and Spectrofluorophotometer, Gas Chromatograph, Cyclic Voltammeter and Anodic Stripping Voltammeter are available to provide academic excellence as well as industry oriented training to its post-graduate students. Presently about 135 students are pursuing their doctoral studies. Every year nearly 100 scientific papers are published from the department in the peer reviewed journals. The department was supported by DST under FIST during 1999-2002 and 2009-2014.

Civil Engineering

The Department of Civil Engineering at the Indian Institute of Technology is the oldest and the largest Civil Engineering Department in India. It has a glorious history and illustrious past. It was established on November 25, 1847 as Roorkee Civil Engineering College, the first engineering college in India as well as the entire British Empire at that time and renamed in 1854 as Thomason College of Civil Engineering, to train Civil Engineers for design, construction and operation of the Upper Ganga Canal that flows from Hardwar to Kanpur. The college laid the foundation of modern technical education in general and civil engineering practices in particular for infrastructure development of the country. The department has produced many eminent engineers who made remarkable contributions in the planning, design and execution of civil engineering projects in India as well as abroad.

The department offers a four-year undergraduate programs leading to the Bachelors Degree in Civil Engineering and two-year post graduate programs leading to Master's degree in six major specialisations of civil engineering, viz. Environmental Engineering, Geomatics Engineering, Geotechnical Engineering, Hydraulics Engineering, Structural Engineering and Transportation Engineering. It also offers doctoral programs on emerging global problems in these specializations. There are at present more than 550 undergraduate students, more than 200 postgraduate students and 150 research scholars in the department. It also provides higher education to a large number of sponsored foreign students through agreements of Government of India with various countries from mainly Africa, Middle East and Europe.

The department is keeping pace with the latest developments in engineering education and has high ranking in quality of its academic programmes. The research programmes of the

department are funded by various agencies such as CSIR, DST, MOST, ISRO, MHRD, DRDO etc. Research fellows working on these programmes are also eligible to register for the Ph. D., as per the Institute's guidelines. Teaching faculty of other engineering colleges also conducts research under the Quality Improvement Programme at the department to obtain Ph.D. Degree.

The faculty of the department continues to strive loftier by exploring new frontiers of knowledge, imparting the latest technical knowledge to the students and conducting high quality research. The faculty also renders technical advice on live engineering problems to various agencies in the form of consultancy projects worth Crores of rupees.

Earthquake Engineering

Earthquake engineering education in India started at the Indian Institute of Technology Roorkee (erstwhile University of Roorkee) in 1960, through the establishment of School of Research and Training in Earthquake Engineering. The School was renamed as Department of Earthquake Engineering and became an integral part of the University of Roorkee in 1979. Four major areas of earthquake engineering namely, Structural Dynamics, Soil Dynamics, Engineering Seismology and Seismotectonics, and Instrumentation have been nurtured for more than half a century. Major functions of the Department include teaching and research, and rendering expert advice to various organizations/agencies in all areas of earthquake engineering. This includes earthquake resistant design of structures and systems, such as dams, bridges, power plants, etc. The Department has played a key role at the national level in formulating Indian standard codes of practice for earthquake resistant design of structures.

Several major facilities exist in the department for conducting experiments related to earthquake engineering. The major facilities include: A low cost railway wagon shock table for dynamic testing of full scale structural models, a 3.5 m x 3.5 m computer controlled shake table with a maximum pay-load capacity of 20 tonnes to simulate earthquake ground motion, a quasi static testing laboratory having servo-controlled dynamic actuator systems and servo-controlled compression testing machine of 300 tonnes capacity, a soil dynamics laboratory equipped with facilities for dynamic testing of soils and foundations, liquefaction table, geotechnical centrifuge and cyclic triaxial testing system, a resonant column apparatus and a seismological observatory having state-of-the-art 3-component digital broadband seismograph to record local, regional and tele-seismic events. The Department has deployed a state-of-the-art 12-station telemetered network in the Garhwal Himalaya to continuously monitor the local seismic activity around Tehri dam.

Earth Sciences

The history of geological studies in our Institute date back to the middle last century when Sir Proby Thomas Cautley, the founder of the Thomason College of Engineering, produced systematic record of vertebrate fossils in the nearby Siwalik ranges. Formal teaching & research in Earth Sciences, commenced with the joining of Henry Benedict Medlicott, FRS, as the first Professor of Geology and Experimental Sciences at Thomason College in 1854.

The Department of Earth Sciences, formerly the Department of Geology and Geophysics, was established in 1960. Engaged actively in teaching and research on topical subjects in Earth Sciences, it is now one of the leading educational centres in the country.

The synergy between Geology and Geophysics has been the main strength of the Department since its inception in 1960. The Department is well equipped with infrastructure and national facilities for advance teaching & research. A large number of graduates from this Department are the backbone of the Country's Mineral, Oil and Exploration Industry. Many of our alumni are now distinguished faculty and scientists in several prestigious Earth Science Departments, elsewhere in the country. The contributions of the Department have been recognized through competitive research grants, such as the Special Assistance Program, COSIST & FIST Grants of University Grants Commission and Department of Science and Technology, Govt. of India.

The Department has been running two five Year Integrated programmes: M.Tech. in Geological Technology and M.Tech. in Geophysical Technology since 2007. In addition, it offers a two years M.Sc. (Applied Geology) course and Ph.D. programmes in various disciplines of Earth Sciences. Several faculty members and ex-students have been conferred with highest academic recognitions such as, Shanti Swaroop Bhatnagar prize, J.C. Bose Fellowship, National Mineral Award, UGC Career Research Award, and the prestigious Fellowships of Indian National Science Academy, Indian Academy of Sciences and National Academy of Sciences. The Department has been consistently funded through research and consultancy projects by the agencies like UGC, CSIR, DST, ONGC, MoES, MOEF and consultancies sponsored by various industries, for the last several decades.

The Hamrock Society brings the students and faculty members of the Department on a common platform that is consistently occupied with a host of curricular and extra-curricular activities. It also educates local and outside school children through visits to various laboratories and museum.

Electrical Engineering

The Electrical Engineering Department was a part of the Thomason College of Engineering from the year 1897, one of the earliest such specializations in the world when the discipline itself was in its infancy. The first batch of Electrical Engineers passed out of the College in the year 1900. This department was, however, closed down in the year 1923 following the recommendation of a special committee that the college may be converted to a purely Civil Engineering Institution. This decision was not to be reversed until on the eve of being converted into a University. The Fortescu Committee advised the resumption of instructions in Electrical Engineering and thus, the present Department of Electrical Engineering came into being in 1946, the first graduates of the new department emerging in 1949. Initially, the department offered courses with options in both Electrical and Telecommunication Engineering. Subsequently, in 1964, the department was bifurcated to form the two Departments of Electrical Engineering and Electronics and Telecommunication Engineering. In 1954, this department was one of the first few ones in India, to start the postgraduate program. Since then, the department has never looked back and since 1964, over 200 Ph.D. degrees have been awarded. Presently the

department is running four year undergraduate course in Bachelor of Technology (B.Tech.), five year IDD programme with B.Tech. degree in Electrical Engineering plus M.Tech. degree in Power Electronics and the postgraduate courses in four areas of specializations. In addition, the department is providing excellent facilities to carry out research work for Doctor of Philosophy (Ph.D.) degree, R&D work for sponsored and consultancy projects and testing and consultancy work for industrial problems.

The department has specialization in research areas such as : ANN and fuzzy logic applications, Distribution system planning and operation, Telemedicine, ECG signal analysis and classification, System analysis and optimization, Computer controlled system including process control, Computer controlled multi-quadrant solid-state converters, Condition monitoring of electrical machines/drives, Digital signal and image processing, Data base management, Economic dispatch and planning, Flexible AC transmission system, FPGA based control, High performance computer controlled DC and AC drives, Intelligent instrumentation, Industrial instrumentation, Medical system modeling, instrumentation and bio-informatics, Modeling and simulation of electric machines, Optimal system operation, Power system protection, monitoring, control and simulation, Power quality, System automation and monitoring, Relay coordination, Reliability engineering, Robotics, System modeling, Process instrumentation and control, Power system automation, Artificial intelligence applications and Voltage stability of power system, Embedded Systems, Sensors & Sensor Networks.

Electronics and Communication Engineering

From a relatively modest beginning with a B.E. programme in Telecommunication in 1957 as part of the Department of Electrical Engineering in the then University of Roorkee, Department of Electronics and Computer Engineering (E.& C.E.) at IIT Roorkee has been continuously striving for excellence in engineering education and research, and, at present, it is one of the largest departments in the Institute in terms of student strength and number of academic programmes. Right from its inception as a separate department in 1964, diversification, focused growth and consolidation of earlier initiatives have been the mission of the Department. In January 2013 a new department named as Department of Computer Science and Engineering was carved out of it and the present department was re-christened as a Department of Electronics and Communication Engineering.

The Department has always been on a high growth path to keep pace with the ever increasing importance of the major disciplines of study and current technology trends. A judicious mix of experienced and young faculty with strong commitment to academics has created an ambience for learning. Both the undergraduate and post-graduate curricular structure and syllabi are updated regularly to reflect recent technological developments, and industrial and national goals. The Ministry of Information Technology has established a Center for Manpower Development in VLSI in the Department and has funded a project on Information Security Education and Awareness. Recently, the RailTel IITR Centre for Excellence in Telecom (RICET) has been established in the Department with the signing of a tri-partite MoU between the Department of Telecommunication, Government of India, IIT Roorkee and RailTel Corporation of India Ltd. A great number of alumni of

the Department have also contributed significantly to national development objectives and to academics.

The Department has strong research programmes leading to Ph.D degree in all the areas of Electronics and Communication Engineering. A large number of Ph.D scholars are currently engaged in cutting edge research in the Department. In addition to the well-equipped curriculum related laboratories, the Department has many state of the art facilities for assisting research and development in Microelectronics, VLSI, RF & microwave engineering, communication systems, digital signal processing, image processing and wireless technology. These have been set up with support from Government agencies and industries. The Department has successfully completed a large number of sponsored research projects funded by various DEITY/agencies. The number and scope of current projects funded by DST, MHRD, DOE, DRDO, PRL, Naval Research and Army Technology Boards and the likes bear testimony to the research potential of the Department.

Computer Science and Engineering

Computer Science education at IIT Roorkee made a modest start in early seventies with the introduction of two PG diploma course in computer hardware and software under the Department of Electronics and Communication Engineering. Very soon these diploma courses were consolidated into a Master of Engineering programme in 1975. This was a time when computer education was going through its initial phase in our country. Looking at the future potential of this discipline and the increasing manpower requirements for the industry and technology, the department started a 4-year bachelor's programme in Computer Science and Technology in the year 1983. An M.Tech. programme on Information Technology was also started in the year 2003.

As Computer Science education became a significant component in the Department, its name was appropriately changed to Department of Electronics and Computer Engineering in the year 1987. In 2001, when the University of Roorkee was declared the 7th IIT, the Department started an Integrated Dual Degree (IDD) programme leading to degrees of B.Tech.(CSE) and M.Tech.(Information Technology) besides the ongoing UG and PG programme in CSE. A review of the past initiatives and future course of growth led, however, to the discontinuation of the M.Tech.(Information Technology) and the IDD programme in the year 2012. The corresponding seats were added to the B.Tech. (Computer Science and Engineering) programme.

In January 2013, in order to create a better focus on the increasing Computer Science activities of the Department, a separate Department called the Department of Computer Science and Engineering was carved out of the parent Department.

The M.Tech. Programme offers a wide choice of elective courses so that students can specialize in their chosen field of specialization, like data mining, cloud computing, distributed systems, and network security.

A large number of M.Tech. and Ph.D. students are engaged in cutting edge research in the department. This creates a very appropriate research atmosphere for M.Tech. students also. The department has well equipped state of art laboratories for teaching and research. The High Performance Computing lab

houses a 20 node SUN cluster besides other facilities. The Information Security Laboratory was set up with assistance from CISCO and Data Mining research laboratory has recently been set up with support from IBM. The department is also in the process of establishing a Cloud Computing facility shortly.

The department has experienced faculty who have successfully completed or are working on a large number of sponsored research projects funded by DIT, DST, MHRD, DOE, DRDO, IBM, INTEL, RAILTEL etc.

Humanities and Social Sciences

Established in 1966, the Department of Humanities and Social Sciences endeavors to integrate human values and social concerns with technical education. Started primarily to teach English and Social Sciences to engineering students, it now possesses a vibrant and distinct identity, with teaching and research programs encompassing almost all the departments of the institute with its core, elective, and Pre-Ph.D., courses numbering thirty one. The department has recently started a PG programme in Economics (M.Sc.) which has provided a unique opportunity to the students and faculty. The Department undertakes teaching and research programs in the areas of English, Economics, Psychology, Philosophy, Sociology, IPR, Fine Arts and related interdisciplinary subjects. Till date, about seventy scholars have been awarded Ph.D. degree in different disciplines of the department, and thirty-four students are currently registered for this program. The Department also runs an evening course in German language. To facilitate and constantly upgrade teaching and research, the Department has Economic Data Base, Computer Lab, Psychology Lab and a state-of-the-art Language Laboratory with 60 booths. The faculty members have been engaged in sponsored research projects and consultancy. So far 8 major and 12 minor projects and 10 consultancy projects have been undertaken by the members of faculty, besides organizing training programs for teachers through QIP. Further, 405 research papers and book chapters, 25 books have also been published by the departmental faculty, whose erudition has been highlighted through a range of national and international recognitions.

Hydrology

The period of 1965 to 1974 saw the establishment of a number of International Post Graduate Courses in Hydrology under the United Nations Educational Scientific and Cultural Organisation's (UNESCO's) International Hydrology Decade launched in 1965. The training and education in Hydrology was one of the main components of this programme. The Department of Hydrology (DOH) came into existence with the inception of the International Post-Graduate Course in Hydrology in 1972. The courses offered by the Department of Hydrology are presently sponsored by Government of India, UNESCO and WMO. So far, a total of 888 participants including 322 foreign participants from 39 countries have participated in the Post Graduate Programme. Since 2003, GATE qualified fresh engineering and science graduates from India have also been admitted in this programme.

Management Studies

The MBA programme was launched by the Institute to reflect the needs of present-day dynamic business and economic scenario and to enable its students to face the challenges of corporate world. The purpose behind this is to give the student a sustainable competitive advantage. It takes the onus to prepare a breed of managers who have the courage, skills and resilience to excel in the corporate world.

Mathematics

The Department of Mathematics attained its present status as an independent department in 1960. Growing steadily, today the department offers two Year M.Sc. course in Mathematics and a five-year Integrated M.Sc. in Applied Mathematics. It also teaches various topics in mathematics to under graduate and post graduate students of engineering and science departments. The department offers the facilities for research work leading to Ph.D. in different branches of pure and applied mathematics. The department has so far produced more than 200 Ph.Ds including international students. Most of them are well established in nationally/internationally acclaimed institutions and organizations. The faculty is actively engaged in several research and consultancy projects funded by national/international agencies. Besides the state-of-the-art central facilities of library and computer centre, the department has its own up-to-date departmental library and computational lab. In addition, the department has CFD lab, mathematical modeling lab and image processing lab also.

Mechanical and Industrial Engineering

The Department of Mechanical Engineering came into being in the year 1946 and renamed as Department of Mechanical & Industrial Engineering in 1973. At present, it offers both under graduate and post graduate teaching in various facets of Mechanical & Industrial Engineering. The department offers Master of Technology courses in Thermal Engineering, Machine Design Engineering, Production and Industrial Systems Engineering, Welding Engineering and CAD, CAM and Robotics. The department has modern sophisticated laboratory and workshops facilities to support advance research in all areas of Mechanical and Industrial Engineering.

The faculty actively collaborates with national/international research organizations for research/consultancy works. The department conducts conferences and short term courses. The excellence of the department in Research and Development has been well recognized. The department has received funding from various agencies such as ISRO, DAE, BARC, DST, DRDO, DEITY, CSIR, etc.

Metallurgical and Materials Engineering

The department of Metallurgical and Materials Engineering was set up in 1963 when several new disciplines were started in the IIT Roorkee erstwhile University of Roorkee. In its history of fifty three years, the department has distinguished itself by its contribution to teaching, research and extension activities. Initially the department offered a curriculum based on metals and alloys covering various aspects of Physical, Extractive and Mechanical Metallurgy. However, it was realized that an integrated training on whole range of materials is necessary in

the context of present day technology. Therefore the department has developed a curriculum around the year 2000 to provide a strong foundation in metals, ceramics, polymers and composites. Currently the department has several on-going research activities in the area of alloys department, composite materials, modeling and simulation, joining of materials, tribology behaviour of materials, corrosion of materials, functional ceramic materials, energy conversion and storage materials, bio-materials. The faculty members of the department deal with several sponsored research projects of various funding agencies viz. DST, CSIR, BRNS, DRDO, NRB, ect. and also provide consultancy and testing services to various industries. The faculty members have also established international collaboration with various institutions abroad viz. UK, Germany, Austria, South Korea, Australia, ect. This year the department has received an intake of 100 B.Tech. students. A total of 35 students were admitted for masters courses in specializations of Industrial Metallurgy and Materials Engineering. About 60 Ph.D. students are currently doing their research in the department. Over the past several years, significant infrastructural growth have taken place in terms of building, laboratories and equipments. The addition of various state-of-art equipments viz. Thermomechanical simulator, Spark plasma sintering set-up, Fatigue testing machine, X-ray diffractometer and Scanning electron microscope during the last five to ten years time, have facilitated the research activities of the department. A number of patents have been filed for innovative research and some of them are under active consideration for industrial licensing. A number of our alumni have received several prestigious national and international awards.

Physics

From a modest beginning in 1960, the Department has now grown into an active center of quality teaching and research. Today it stands as one of the leading departments in the country, well known for its high quality teaching and research. The department offers B.Tech. (Engineering Physics), five year integrated M.Sc. (Physics), two year M.Sc., M.Tech. (Solid State Electronics Materials), M. Tech. (Photonics) and Ph.D. programmes to the students. The four-year B.Tech. program in Engineering Physics has been inducted with effect from July 2015 with admission through JEE. Besides teaching the undergraduate engineering students, the faculty of the department provides active leadership in training the postgraduate students, which is evidenced by their performance in GATE and NET. In fact, up to 75% of the total strength of the students has been qualifying in GATE often holding a few top ranking positions. Our achievements in research have been well recognized by U.G.C. and DST in selecting our department under Special Assistance Programme many times since 1979 and FIST programme respectively. The department has research activities in the areas of Accelerator Physics, Atmospheric Physics, Atomic and Molecular Physics, Condensed Matter Physics (with special relevance to energy harvesting and storage that includes Solar photovoltaics, Li-ion batteries, Supercapacitors), Nanoceramics, Photonics & Fiber Optics, Quantum Optics, Nuclear and Particle Physics and High Energy Physics. The department is successfully running various major and minor research projects funded by DRDO, DAE, SERB/DST, MIT and CSIR.

Water Resources Development and Management

The department was established in 1955 as an Afro-Asian Centre to impart training to in-service professionals in the field of water resources development and management. At present, the department offers application-based Postgraduate Degree programmes in Water Resources Development and Irrigation Water Management in-service professionals & GATE qualified graduates in Civil, Electrical, Mechanical and Agricultural Engineering and Agricultural Sciences. A balanced blend of academicians and field engineers in the faculty with long experience in planning, design, construction, operation, and maintenance of water resources development and irrigation water management projects help in implementation of application oriented academic programmes. The department is actively involved in research, development and extension activities in the areas of water resources and irrigation management. The objective of the Department is to develop manpower that can take the responsibility of sustainable development and environment friendly management of the available water resources. The department has so far trained about 2681 in service engineers and agricultural scientists from 51 countries including India.

Paper Technology, Saharanpur Campus

The Department of Paper Technology at Saharanpur Campus is an industry oriented academic department of the Indian Institute of Technology, Roorkee. The Saharanpur Campus located about 50 km away from Roorkee, is a full-fledged campus with all the academic and other infrastructural facilities. This department (erstwhile Institute of Paper Technology) started in 1964. It has been offering various academic programmes in Pulp & Paper.

Presently, the Department of Paper Technology offers the following academic programmes:

Two-year M. Tech. (Pulp & Paper)

Two-year M. Tech. (Packaging Technology)

The department has well developed laboratories in the area of pulp & paper, environmental engineering, biotechnology, and process instrumentation & control. Several state of art equipment/instrument like automatic dynamic sheet former, dynamic drainage analyser, laboratory coating machine, formation tester, fiber quality analyser, and a digitally controlled multi-purpose reactor have been added. Besides these, sophisticated analytical facilities like FE-SEM, XRD, AFM, FTIR, GC-MS, ICP, AOX, CHNS analyzer, and TOC are available at the Saharanpur Campus. The department was supported by DST under FIST during 2002-2007 and is supported currently for the period 2012-2017.

The department has multidisciplinary faculty engaged in teaching, research, and consultancy in the areas of pulp & paper, chemical recovery, environmental engineering, packaging & polymer, biotechnology, wireless communication. Presently, about 114 students are pursuing their Ph.D. studies at the Saharanpur Campus.

4. CENTRES OF EXCELLENCE

Disaster Mitigation and Management

Centre of Excellence in Disaster Mitigation & Management (CoEDMM) has been established in the year 2006 with the aim of conducting educational programme, cutting edge research and training on disasters, vulnerability and their mitigation. Creation of a National Database for rapid dissemination of information and knowledge is also an objective.

The centre is a multidisciplinary research and education centre. Main aim of the educational programme is to impart advanced knowledge on technical and managerial skills to the professionals to make them equipped with innovative technologies for effective mitigation and management of disasters for overall benefit of the society.

The centre aims to achieve excellence in key areas of education and research at par with international standards. Regional issues especially related with Earthquakes, Landslides, Tsunamis, Floods, Cyclones, Droughts, Bio-Chemical Disasters and their early warnings are other focus areas.

The centre has faculty with domain expertise in Earthquakes, Landslides, Tsunamis, Floods, Cyclones and Geomatic Technology. Research and consultancy projects are carried out through sponsored funding from Government of India and other National and International funding agencies.

The centre is running Ph.D. programme since its inception, many

PhDs have been awarded and a number of others are in progress. Since July 2012, an M.Tech programme in "Disaster Mitigation and Management" is running at the centre.

Centre for Nanotechnology

Centre for Nanotechnology was established in December 2005 as one of the Centres of Excellence. The faculty of the centre, drawn from different departments is involved in developing state-of-the-art facilities at the institute and is vigorously pursuing interdisciplinary research on various current aspects of Nanoscience and Nanotechnology. For this purpose the Institute has granted 40 MHRD assistantships to the centre. A wide range of sophisticated equipment related to nanotechnology has been made operational at IIC involving the multidisciplinary faculty of the centre.

In view of the major impact of 'Nanoscience' in vast disciplines of Science and Technology, M.Tech. programme on 'Nanotechnology' had started in 2008. This course aims at providing the basic knowledge to B.Tech./M.Sc. students about various concepts of nanoscale materials, their synthesis, characterization, novel properties, applications and future perspectives. This being a multidisciplinary area, a number of electives have been designed to impart-knowledge on Nanoscale modeling and simulation, Nanophysics, Nanochemistry, Nanobiotechnology, Nanomedicine and technological aspects of Nanomaterials. Also Nanocomposites related to sensor and actuator application, Nano manufacturing, modification of different nanofillers is also done to this centre. Besides, it is providing students a practical training on advanced methods for the synthesis, characterization and elucidation of different nanostructures.

This expertise could be utilized to fabricate new Nanomaterials and Nanodevices for various applications.

Centre for Transportation Systems

CTRANS is a Centre of Excellence of IIT Roorkee in the area of Transportation Systems with an aim to promote multidisciplinary and high quality research and education in Transportation Systems with collective participation of Engineers, Scientists and Researchers from Science & Technology, Humanities and Social Sciences, Architecture & Planning and Management Studies background. The Research and Education in multidisciplinary areas covers all modes of transport like Road Transport, Rail Transport, Air Transport, Inland Navigation & Water Transport & Pipe Line Transport. The research areas are Public Transport System, Airfield and Highway Pavement Management System, Intelligent Transport System, Design of Comfort (Rail Transport), Environmental Impact Assessment, Environmental Management, Biofuels for Automobiles, Air Quality Modeling, Mathematical Modelling, Supply Chain Management & Logistics, Electric Trolley System, Traction Technology, Remote Sensing, GPS & GIS Applications, Inland Water Transport, Polymer Applications in Transportation Systems, Accident Modelling and Road Safety, Urban Transportation Policy, Management of Transport Systems, Visual Communication Design System, Aesthetics, etc. The Centre is equipped with a number of modern equipments i.e., Road Measuring Data Acquisition System (ROMDAS), Portable Automatic Traffic Counter-cum-Classifier, Trimble IR 5600 Robotic Total Station, Electrodynamic Vibration System, Falcon Handheld Stationary Radar with Data Logger for Measurement of Vehicular Speeds, Integrating-averaging Noise Level Meter, 50" Plasma TV for Traffic Analysis study, Portable Falling Weight Deflectometer, Diamond Core Drilling System, Portable Reference Measurement System, Ground Penetration Radar (GPR) for Utility Detection and High Cell Density Bio-Reactor, Electronic Portable Static Wheel/Axle Weight Scale, Hand held Analyser with Sound Level meter for Aircraft Noise measurement The Centre has Sound Plan, HEADS, TRANSCAD VISUM & VISSIM softwares for a variety of transportation system problem analysis. The Centre has a good computing facility for modeling and simulation of transportation systems. A multi-Institutional Nationally Co-ordinated Project entitled "Integrated Development of Public Transport System" Sponsored by AICTE has been successfully executed at this Centre. The DST, GOI has sanctioned a R&D Project on "Design and Analysis of Urban Multimodal Mass Transportation System". CTRANS also offers Advice and Consultancy Services. The CTRANS has provided Consultancy Services to CPWD for Development of State Highways in Bihar State for a Consultancy amount of Rs. 5.6 crores. A number of research scholars are pursuing Ph.D. on the identified multi-disciplinary research areas at CTRANS.

5. ACADEMIC SERVICE CENTRES

Centre for Continuing Education

A pioneering centre in the area of continuing education, has completed more than 50 years of service. This centre acts as a window to disseminate information and technology on latest developments in the globe to face with rapid technological advancements. Courses are being organized through the

technical expertise available in various departments of the Institute, experts are also invited from industries and R&D organizations to upgrade knowledge, to provide a platform for generating ideas, and for stimulating the current needs of the in service professionals. These courses are organized in consultancy as well as in sponsored mode to fulfill the clients' needs. The Centre has conducted about 250 courses/training programs during last three years in various disciplines of management, engineering, science and technology to professionals from India and neighbouring countries.

The Centre is fully equipped with modern teaching aids, internet, wi-fi and an excellent boarding and lodging facilities.

Quality Improvement Programme Centre

About the Centre

The Quality Improvement Programme (QIP) Centre at the Institute, started in 1970-71, has been endeavoring to improve the quality of technical education among engineering faculty in the country since its inception. It has been making efforts to upgrade the teaching curricula and enhance the knowledge of teachers of various engineering colleges/institutions. Activities of the centre include:

- Providing opportunities for faculty members of AICTE recognized engineering Colleges/Institutes to improve their qualifications, i.e. Masters and Ph.D. degree programmes.
- Organizing Short Term Courses on the topics of recent interest by the faculty of IIT Roorkee alongwith experts from outside for serving faculty working in engineering Institutes/Colleges.
- C.D. cell activities which include curriculum development (CD) as well as its revision, preparation of monographs and text books, laboratory manuals, examination reforms, undertaking of inter-institutional programmes, holding of seminars/conference, one day workshops and panel discussions, developing educational technology, preparation of resource materials and undertaking of any other activity which helps to improve classroom teaching.

Institute Instrumentation Centre

The Institute Instrumentation Centre has a wide range of analytical facilities for processing and characterizing materials. These facilities are available for use by researchers (students/faculty) in both academia and industry, not only for the academic community of IIT Roorkee, but also to various research organizations and industries across the Nation.

IIC is equipped with more than twenty specialized and sophisticated equipments for analysis and solution of intricate scientific and industrial problems. These include, among others, Nuclear Magnetic Resonance (NMR), Thermal Ionization Mass Spectrometer (TIMS), Electron Probe Micro Analyzer (EPMA), Macromolecular Crystallographic Unit (MCU) for protein crystallography (All the required facilities for cloning to crystallization are available), X-Ray Fluorescence Spectrometer (WDS-XRF), Powder X-Ray Diffractometer, Glancing angle XRD, Single crystal XRD, Scanning Probe Microscope (SPM), Field Emission Scanning Electron

Microscope (FE-SEM), 200 KV Transmission Electron Microscope (TEM), Scanning Electron Microscope (SEM), Superconducting Quantum Interference Devices (SQUID) Magnetometer, Vibrating Sample Magnetometer (VSM), Atomic Absorption Spectrophotometer (AAS), Fluorescence Life Time System, Inductively Coupled Plasma Mass Spectrometer (ICP-MS) attached with Laser Ablation, Differential Thermal and Thermo Gravimetric Analyzer (DTA/TGA). Each laboratory generally has an operator working under the supervision of a faculty member or a scientific officer. Besides these, the Centre includes a training laboratory for summer training of the engineering students.

This Centre provides modern facilities for advanced materials processing and characterization. The facilities include well established Nanoscience Lab. which consists of state of the art nanomaterials synthesis facilities (Sputtering and Pulse Laser Deposition Technique for Nano-materials synthesis). These facilities have been developed from the sponsored research grants. So far 6 major research grants have been received from various funding agencies such as DST (Under Nanoscience program), DRDO, CSIR, DAE and CPRI Bangalore. These facilities are being heavily used by more than a dozen graduate and postgraduate students.

Institute Computer Centre

The Centre works towards the common goal of implementing the academic agenda of the Institute by constantly interacting, evaluating and updating the resources to meet the international standards.

ICC, a central computing facility, is equipped for High Performance Computing, which includes infrastructure for Cluster Computing, besides high-end Servers and Workstations on heterogeneous platforms. Linux based HPC Cluster and all the other servers can be accessed within the campus including DPT Saharanpur Campus through campus LAN.

- ICC has a Linux based High Performance Computing (HPC) facility with 16 nodes (15 compute nodes (148 cores)+ 1 head node) and automatic backup system with latest RHEL OS (RHEL HPC server/compute nodes OS) and middleware including Intel Cluster Studio with latest compilers and MPI libraries for parallel-processing applications, PBS Pro Job scheduler and Cluster Management Software- HP Insight CMU. For automatic back up- Back up server, Tape SMSL 2024 Tape Library and Hp Data protector Software.
- Centre has a wide range of servers from Intel based servers with to high-end Blade Servers with SAN (Storage Area Network) and NAS (Network Attached Storage). It has mid-range to high-end configured computing and graphics workstations.
- ICC has state-of-the-art facilities for applications such as: CAD/MCAD, Computational Fluid Dynamics (CFD), FEM & FEA, Image Processing / Scientific Visualization, 3D Animation/Visual Simulation/ Geospatial imaging and analysis.

Centre provides dedicated systems with specialized software required by students of M.Tech, and Ph.D. scholars during their dissertation/thesis period in the Research Scholars lab at ICC. These are high-end workstations with multi-core with high processing speed and high capacity memory and graphics adaptors in network with remote access facility on 365x24x7 basis. Scientific

and engineering software licenses being served through servers at ICC.

ICC's software licensing facilities provide the following major engineering and scientific softwares available throughout the campus over the LAN with network floating licenses:

- ANSYS Academic Research v 16.2
- ArcGIS 10.3.1
- Autodesk Revit Architecture Suite 2009 & Educational Solution Set 2009
- Abaqus 6.8.1
- Bentley Suite of Products under Academic subscription with a set of 50+ software for Civil Engineering, Architecture, Plant Engineering, Geospatial, Geotechnical, Hydraulic Engineering, and Structural Analysis
- Creo 2.0 (formerly Pro/E)
- ERDAS Imagine 2015 with LPS and Imagine Developers Toolkit and ER Mapper
- Hytran 3.7.3-7
- Intel Visual Fortran 9.0
- NI LabVIEW Fall 2015 Academic Site License
- MATLAB R2015b with various tool boxes & Distributed Computing Engine
- Mathematica 5.0
- Mechanical Autodesk Inventor Series 11
- MagNet 64 bit v 6.22.1
- NAG Libraries and Compilers
- Oracle 9i & 10g
- SARscape 4.2 with ENVI 4.7
- ETABS Ult V -2015 and SAFE P/T V- 2014; SAP 2000 V 18.0
- SPSS 16.0
- Solid Edge 18.0
- Adobe Acrobat 9.0 Prof. (Academic Version)
- Microsoft software products under School and Campus Agreement for latest version.

• The Centre maintains a comfortable environment, conducive for research & training for both students and faculty.

• Short term training programmes /workshop/seminar for students, faculty members and office staff are also being organized by the centre.

• It has six job-specific labs with about 220 desktops/work stations in 100/1000 mbps CAT 6 based structured network having gigabit managed switches with internet connectivity at every system.

• Computer Centre runs in two shifts from Monday to Friday from 8:00 AM to 11:00 PM and on Saturday and Sunday 8:45 AM to 11:00 PM.

• It is rendering services all 7 days/week. Computing and software license serving facilities are available on 24x7 basis within the campus including DPT Saharanpur.

Networking resources at ICC acts as the nodal centre for outside/inside connectivity to the campus and serves as an Information Technology Center for promoting the effective use of IT, IT Systems, resource management and facilities for modernization/automation of the IP Infrastructure of the Campus.

- Total Internet bandwidth connectivity available in the campus is 10 Gbps
- Internet and e-mail facilities to all students and LAN connectivity in each room of all hostels.
- LAN in Multi Activity Centre and Technology Block of SRE campus.
- E-notice Board, Portal for Online Placement for Campus Interview, online subject registration and Institute Website.
- VPN (Virtual Private Network), Authentication, Centralized Network Admission Control etc.
- Antivirus at E-mail Gateway and Desktops of Campus Network based Antivirus solution for desktops in campus- (i) Trend Office Scan Corporate Edition (ii) Norton Symantec End Point Protection.
- Multipoint Video Conferencing and Virtual Class Room facilities- For conducting interviews, meetings and interactive lectures. Centre also is having two Virtual Class Rooms under NKN-VCR project for conducting lectures through VCs for SRE campus as well as for other Institutes.
- Multicast Video Streaming- Centre is doing multicast video streaming for convocation over campus LAN and at Intranet for last several convocations.

The Institute has a star topology Gigabit Ethernet Switch based, state-of-the-art Enterprise class network with data, voice and video communication capabilities. All departments, centres and Saharanpur campus are connected to the Information Superhighway through Optical Fiber. The network covers 365 acres of area through wired-line, Wireless access, and ADSL, providing internet/intranet, and e-mail facility to all faculty, students, staff, library, and laboratories.

Institute has 1 Gbps internet lease line link of National Knowledge Network (NKN) from NIC under MHRD Govt of India initiative. 100 Mbps internet leased line link from TATA Communication, New Delhi, 100 Mbps internet leased line link from BSNL Haridwar, 2 Mbps Lease Line link from ERNET India, New Delhi, 34 Mbps dedicated leased line (RailTel) in a close group to Saharanpur Campus.

The ISC also has an Information Management Group (IMG) which is managed by B.Tech. students for developing website and intranet applications.

Mahatma Gandhi Central Library

The Mahatma Gandhi Central Library (MGCL) is one of the oldest academic & technical library of country equipped with latest ICT tools viz. RFID stations, wi-fi networks, surveillance cameras and Apple MAC PCs. It serves as a hub of the academic activities. The Library excels in providing necessary information support to UG and PG students, research scholars and faculty members in the form of books, advanced treatises, reference works, monographs, current and back volumes of scientific journals to its users both as print and e-resources. The total print collection of the library has grown 3,90,000 volumes, which includes books, dissertations, theses, bound periodicals and other documents. Its e-resource collection includes 35000+ e-books, 2,00,000+ back volumes of journals, 15,000+ current e-journals published from major engineering, science and technology publishers for full access, besides 850 journals in engineering and physical sciences, bio-sciences, humanities and social sciences in print. The library also

provides online access to about 16,000 theses and dissertations through SHODH BHAGIRATHI Online Repository (upto abstract level).

The library strives to provide physical facilities with calm and cozy atmosphere conducive to study for long hours like a separate reading room with 80 seating capacity where students are allowed to study with their own books. MGCL uses latest ICT in its functioning to provide 24x7x365 days academic supports to its members throughout the campus on Institute network for accessing available e-resources and consulting ONLINE catalogue of print collection. Whole library building provides wi-fi connectivity for mobile devices and applications. To enable the users to access the resources in more intelligent way, MGCL organizes short term training programmes/workshops for its users. MGCL also facilitates for similarity checking of contents of master and doctoral thesis for plagiarism.

Attractions of the building are terrace garden, open spaces and provision of natural lights for more than three fourth area. This building is a rare blend of modern facilities and elegant architecture. It's fascinating podium with water cascade automatically attracts the attention of the passer-bys by its sheer grandeur. The MG Central library is on its way to provide library services in such a way that **Saakaar** becomes **Niraakaar** and believes in being proactive rather than services on demand.

6. OTHER UNITS

Educational Technology Cell

Educational Technology Cell a part and parcel of IIT Roorkee is situated near the building of Centre for Continuing Education. This cell was primarily intended to produce high quality Video/web/multimedia based instructional material, Syllabus based content development for the National Programme for Technology Enhanced Learning (NPTEL) project, short courses/training programmes for faculty for development of video/web based course. Over the period of time its role has expanded to absorb new paradigms of e-learning, training of faculty to develop their own e-content and use of e-content developed by NPTEL, training of faculty about streaming of video & web based lectures in their respective institutes, streaming of round the clock video lectures on demand, at IIT Roorkee, creation of question banks, quality control of e-content generation through feedback mechanism, conduct of research related to pedagogies in e-learning, creation of innovative virtual experiments, support to "National Mission Challenges" undertaken by the Department of Higher Education, MHRD. The cell has state-of-art digital video camera, non-linear editing systems, audio and video systems, teaching aids, substantial number of computers, servers and softwares required to produce high quality Web based and Video based course. The cell has already produced 6 web based courses and 9 video based courses under NPTEL Project. These courses are accessible to anyone in India and abroad through the web site <http://nptel.iitm.ac.in>. This centre is also connected to satellite through EDUSAT (a facility provided by ISRO) to provided facility for the functioning of country-wide class room.

Intellectual Property Rights Cell

The Intellectual Property Rights Cell of IIT Roorkee primarily functions to create awareness and to provide guidance to the academic and non-academic staff, students and research scholars on the practices and the rules and regulations of the institute regarding Intellectual Property Rights (IPRs) and obligations within the frame work of the IPR policy of the Institute. It works to safeguard the interest of inventors regarding IP with legal support which is necessary. During last 11 years from January 2005 to January 2016 IPR Cell has processed **88** disclosures/ applications for patent filing and 32 of these have been filed. Two cases from the filed applications have been processed for technology transfer, 3 of these filed cases patent numbers are granted.

The IPR Cell also developed syllabus on education of IPR for the UG and PG students, which are successfully running in this institute.

The IPR Cell had organized several hand on training session for students, research scholars and faculty members in the past with the primary objective to brief them in **(1)** organizing the research work and innovation identification, **(2)** record keeping of the work **(3)** procedural aspect of patent search and **(4)** filing of disclosure for patent filing.

IPR Cell had also taken several initiatives in the past to meet the investigators and scholars of various ongoing research projects of every department/ centre of the institute to discuss about the state of the art and objective of their studies. This was in order to explore the possibility to organize their work towards creation of IP in which IPR Cell extends its relevant support appropriately.

Training and Placement Office

The Training & Placement Office the Indian Institute of Technology Roorkee, is committed to provide the best of placement opportunities to all the students (UG, PG and Ph.D.) graduating from this Institute. Under the Campus Recruitment Campaign, companies from all the sectors (i.e., Core, IT, Government, Academics, R&D and Financial) are invited for the training/internships and placement recruitment. Each student has to register with the placement office to avail this facility. Normally, the companies would deliver Pre-Placement Talks (PPTs) followed with Written Test/Group Discussions and Personal interviews. The Training and Placement Office of the institute is housed in a separate building with world class infrastructure to facilitate the recruitment process.

Every year, there is an increase in the number of companies visiting the campus. Approximately 250 new companies have been added in last three years. During academic year 2015-2016 around 900 job offers have been received. The training and Placement Office will continue to serve the student community.

7. POSTGRADUATE PROGRAMMES

7.1 The Objective

The main aim of the postgraduate education at this Institute is to inculcate in the students a deep understanding of the fundamental principles, concepts and practices in the chosen

area of specialization and to develop abilities for undertaking research and development through dissertation. To achieve the above goals, the curriculum is designed to motivate the students for self-study, train them for independent work and create environment conducive for innovation. The programme also offers design courses aimed at translating theoretical knowledge to practical application. It also provides opportunities to develop strong linkages with research institutions and industrial R&D units. The postgraduate programmes offer considerable flexibility to students in choosing the electives in pursuance of their academic goals.

Upon admission, the student is attached to a faculty advisor who guides the student in choosing the electives depending upon his/her area of specialization. Each course shall have certain number of credits assigned to it depending upon the academic load and weekly contact hours of lecture, tutorial and practical classes. Students shall be evaluated for their academic performance through tutorials, home work assignments, term papers, field work, surprise quizzes, mid-term examinations and the end-term examination on a 10-point grade system.

7.2 Postgraduate Academic Programmes leading to M.Tech./M.Arch./M.U.R.P. (Two years duration)

The postgraduate programmes in Engineering and Architecture include 42 full-time programmes in different specializations leading to M.Tech./M.Arch./M.U.R.P. degrees. In addition, the departments of Hydrology and Water Resources Development and Management, also offer PG Diploma programmes. Details of different academic programmes leading to M.Tech./M.Arch./M.U.R.P. degree available in different departments along with their codes, number of seats and the minimum educational qualifications for admission are given in **Table-1**. GATE discipline(s) to be considered for admission to different programmes are given in **Table-2**. The curriculum structure of these programmes is given on the Institute website: www.iitr.ac.in

The ordinances and regulations in force determine the general academic requirements for the above programmes for full-time and part-time students.

Admission is open to full time sponsored and part time sponsored candidates also.

7.3 Dual Degree Programme

The M.Tech/M.Arch./MURP candidates pursuing PG degree in any deptt/centre of IITR are permitted to switch over to Ph.D. Programme after 1st year subject to satisfying eligibility criteria.

7.4 Postgraduate Academic Programmes leading to M.Sc. and MBA Degrees (Two years duration)

These programmes include 6 courses of study leading to Master of Science (M.Sc.) degree in Geology, Mathematics, Biotechnology, Chemistry, Physics and Economics; and another programme leading to Master of Business Administration (MBA).

7.5 Eligibility Requirements for admission to M.Tech./M.Arch./MURP Degree Programmes

Essential Requirements

Candidates who possess the minimum educational qualifications as given in **Table-1** are eligible to seek admission to these Postgraduate programmes. In addition, candidates of General and OBC category must have secured at least 60% marks or CGPA of 6.00 on a 10 point scale at the qualifying degree level; but for SC/ST/PD category candidates, this percentage is 55% or 5.50 CGPA on a 10 point scale. The aggregate marks awarded for the qualifying degree will be considered for eligibility.

In case of CGPA awarded on different point scale, **Table-3** as approved by the Senate of the Institute will be considered for deciding eligibility.

These essential eligibility requirements are applicable to all the categories of candidates, viz: regular, full-time sponsored and part-time sponsored candidates. Other conditions for these three categories are as follows:

A. Regular Candidates

- (a) Admission to Postgraduate programmes leading to M.Tech./M.Arch./M.U.R.P. degree as given in **Table-1**, will be open to the candidates qualified in GATE on the basis of either valid Normalized GATE marks only in the disciplines as given in **Table-2** or valid Normalized GATE marks in the disciplines as given in the **Table-2** alongwith Interview/Written Test to be conducted by the IIT Roorkee. **The normalized GATE marks of different papers will be used to prepare the merit list for programmes of a department. These Normalized GATE marks will be calculated by IIT Roorkee as follows:**

$$\text{Normalized GATE Marks in the Paper} = \frac{\text{Normalized Marks Out of 100 OR Marks (if Normalized marks not applicable)}}{\text{Maximum Marks Awarded in that Paper in that year}} \times 100$$

Example: Assume marks scored by the candidate is 64 out of 100 in EE Paper, where maximum marks in EE paper of that year is, say, 92. Then normalized GATE marks of the candidate in EE paper will be as follows:-

$$\text{Normalized GATE Marks in EE Paper of the candidate} = \frac{64}{92} \times 100 = 69.57$$

There will be a cutoff on Normalized GATE marks for calling the candidates for Interview/Written Test and for preparing merit list for different programmes for different categories of candidates.

- (b) **Final year students who will be completing all the requirements of their qualifying examination including backpaper(s)/supplementary(ies) before the date of registration may also apply.** Such candidates will be required to submit a certificate as per the proforma given in **Annexure-1** along with the application form. Such candidates may be admitted provisionally but they will be required to produce the proof of having passed the qualifying degree with the required percentage of

marks or CGPA latest by **September 30, 2017**, failing which their admission shall be cancelled.

A candidate appearing in any part of the qualifying examination including supplementary examination etc. after the date of registration shall not be considered to have qualified for admission in the year 2017-18 and if such a candidate is registered provisionally his/her admission shall be terminated.

- (c) Direct admission upto 10% of the intake without GATE will be offered to IIT graduates with a minimum CGPA of 8.00 on a 10 point scale.
- (d) Candidates having AMIE/AMIS/AMIICHe/AMIIM/Grad IETE, who possess B.Sc. or Diploma in engineering and have at least three years research, teaching or other professional experience at the submission of last date of application acquired in relevant field, are also eligible to apply for admission to M.Tech. courses.

B. Scholarship under M.Tech (Teaching Assistantship) Programme

As per the guidelines issued by the MHRD, 96 scholarships under M.Tech. (Teaching Assistance) programme will be allocated to the IIT Roorkee over and above intake of the institute. These students shall be selected from the best GATE scores and shall be entrusted with the teaching work as decided by the institution. They would be paid scholarship of Rs. 25000/- per month for a maximum of 24 months. The process of selection shall be in accordance with guidelines issued by the Ministry in this regard.

C. Full-Time Sponsored Candidates

- (a) These candidates must have a minimum of two years of full-time work experience till the last date of submission of application form (subject to provision A.[d] as for regular candidates) in responsible capacity in a Registered Firm/Company/Industry/Educational and Research Institution/Govt./Quasi Govt./Autonomous Organization in the relevant field in which admission is being sought. The Firm/Company/Industry shall either be a public sector undertaking or a public limited undertaking registered in a stock exchange or a private concern whose annual turnover during the past 2 years exceeds Rs. 5.0 crores. For a candidate employed in an educational Institution, it should be recognized by AICTE.
- (b) The candidates seeking admission to PG programmes leading to M.Tech./M.Arch./M.U.R.P. including post M.Sc. but not qualified in GATE, may also be considered for admission to different academic programmes but their admission will be based on performance in an Interview/Written Test to be held at IIT Roorkee. The candidates will be called for Interview/written test on the basis of their results of the qualifying degree.
- (c) Candidates should submit the sponsorship certificate along with the application, duly signed by the Head of the Institution/Organization on the proforma as per **Annexure-2**.
- (d) Few candidates are also admitted under QIP, Early Faculty Induction Programme of AICTE and Defence Research & Development Organization Schemes, for

which the admission procedure is separate. For further details, please contact **PG Admission Office, Indian Institute of Technology Roorkee, ROORKEE-247667**.

The sponsored candidates who meet the above mentioned eligibility conditions, along with the minimum educational qualifications given in **Table-1** should apply.

Preference in admission will be given to those candidates who are GATE qualified.

D. Part-Time Sponsored Candidates (Three years duration)

- (a) These candidates must satisfy condition B (a) as for full-time sponsored candidates, with the additional requirement that such organizations must be located either at Roorkee or within a radius of 20 km from Roorkee.
- (b) The candidates seeking admission to programmes leading to M.Tech./M.Arch./M.U.R.P. including post M.Sc. but not qualified in GATE, may also be considered for admission to different academic programmes but their admission will be based on performance in an Interview/Written Test to be held at IIT Roorkee. The candidates will be called for Interview/Written Test on the basis of their results of the qualifying degree. However, no self sponsored candidate will be admitted for part time study.
- (c) There will not be any age restriction. However, preference will be given to those who are below 45 years of age.
- (d) For admission to a postgraduate programme as a part-time student, a certificate from the Head of the Institution/Organization as per **Annexure-3** must be submitted along with the application.
- (e) For part-time students, the concerned academic department will draw up the detailed academic programme on an individual basis.
- (f) The part-time students will be required to attend all lectures, tutorials and practical classes for the courses prescribed for them and must satisfy the attendance requirements.
- (g) The part-time students will not be eligible for any scholarship, prize etc.
- (h) The status of a part-time student will not be changed from part-time to a regular full-time student.
- (i) Members of the Staff of the Indian Institute of Technology Roorkee seeking admission as part-time sponsored candidates should submit the sponsorship certificate from the Registrar and the Staff working in different projects in the Institute should submit the sponsorship certificate from the appointing authority.

Preference in admission will be given to those candidates who are GATE qualified.

Note:The candidates working in Institute/ University awarding PG degree itself are not eligible for admission as part-time or full-time candidate, if facilities are not available except QIP candidates.

E. Foreign Candidates

- (a) Foreign nationals seeking admission to postgraduate courses should apply through the Govt. of India, if they wish to come through any Govt. supported programmes or under Cultural Exchange Programmes, or through Educational Consultants (India) Ltd., New Delhi. They may seek necessary help from the Indian Embassy in their country or their Embassy in India. In addition to these avenues, a provision of direct admission for Non-Resident Indians (NRI's) and self-financing Foreign National candidates exists for Postgraduate and Ph.D. degree programmes in Engineering, Architecture, and Sciences (PG only).
- (b) Foreign nationals are required to undergo medical examination as per medical rules of the Ministry of Human Resource Development, and have to undergo test for HIV at NICD, Delhi within one month of their admission. The admission of foreign nationals would be confirmed only after medical examination and the receipt of the test report regarding HIV.
- (c) Foreign nationals will be admitted only after obtaining the clearance from the Govt. of India. Foreign candidates having student's/provisional student's visa only are eligible for admission.

Note: Admission to full time/part time sponsored candidates will only be offered over and above the sanctioned intake provided departments concerned agree.

For NRI and Self Financing Foreign Nationals

Non-Resident Indian (NRI) nationals residing and studying abroad and self-financing, non-sponsored foreign nationals who are interested in obtaining admission are eligible for admission subject to medical and Government clearances as per Section 7.5 C.

Foreign candidates including NRI and Self Financing Foreign nationals must have fulfilled the following :

- (i) Qualifications equivalent to educational qualifications required for admission to PG programmes as given in **Table -1**,
- (ii) The candidates must have a minimum of two years of full-time work experience in a relevant field
- (iii) Certificate of good conduct and character from the Head of Institution last attended,
- (iv) Three reference letters.

8. ADMISSION PROCEDURE

8.1 Introduction

Admission to various Postgraduate (PG) academic programmes of the Institute is open to all Indian nationals irrespective of caste, creed and sex.

Admission to Postgraduate programmes for the academic session 2017-18 in different academic programmes leading to M.Tech./M.Arch./M.U.R.P. degrees including M.Tech. degree after M.Sc., for full time regular students with MHRD assistantship will be made on the basis of either valid Normalized GATE marks only or valid Normalized GATE marks alongwith Interview/Written Test to be conducted at IIT Roorkee. Sponsored candidates may be admitted through an

Interview/Written Test. The eligible GATE disciplines for different programmes are in **Table-2**.

There are approved numbers of seats in different programmes as indicated in **Table-1** for which assistantships are given by the MHRD to GATE qualified candidates selected for admission within the sanctioned intake. However, the Institute may admit additional eligible (GATE qualified) candidates without assistantship, **provided the concerned departments agree to admit more than the sanctioned intake**.

All the candidates seeking admission to the PG programmes leading to M.Tech./M.Arch./M.U.R.P. degree will have to apply on proper Application Form.

There are few programmes like M.Tech./PG Diploma exclusively for sponsored candidates for which separate admission process is followed and is carried out by the concerned departments which may be contacted directly by the aspiring candidates.

8.2 General Information

- (a) Admission will be offered to the first semester of the various postgraduate programmes.
- (b) A candidate seeking admission to postgraduate programmes leading to M.Tech./M.Arch./M.U.R.P. degree is allowed to apply maximum for **4 departments** and may give prioritized preference for maximum of **14** academic programmes given in **Table-1**. **Choices (max. 14) once filled-in in the Application Form will not be changed for any reason after submission of application form.**
- (c) A student, who is admitted and registered for a postgraduate programme at the Institute but leaves without completing the programme, or discontinues his studies for any reason whatsoever, including termination from the programme for not achieving the required SGPA/CGPA for continuation of his registration in the said programme, shall not be admitted again to a programme at the same level, that is to say that a student who has/is withdrawn from the M.Sc. programme cannot be admitted to any other M.Sc. programme; a student who has/is withdrawn from the M.Tech. programme cannot be admitted to any other M.Tech. programme, of the Institute.
- (d) Selected candidates will be offered admission only in one programme depending on their preference and the merit.
- (e) The Institute reserves the right not to run any particular programme, if the number of students in that programme is less than the minimum number specified by the Institute at the time of admission.
- (f) All the students have to generally reside in the Institute Campus at Roorkee except those admitted to postgraduate programmes in the Department of Paper Technology, Saharanpur Campus, who will reside at the Saharanpur Campus of the Institute located about 35 km from Roorkee.
- (g) The Institute reserves the right to change its statutes and regulations relating to academic programmes and the modalities of admission without prior notice.
- (h) Candidates belonging to SC, ST, OBC categories must submit along with filled Application Form the requisite

certificate as applicable from the competent authority, as per the list given in **Annexure-4**, failing which their candidature will not be considered under Reserved Category. The candidates under Persons with Different Abilities (PD) category will submit the certificate from the Medical Board of the District concerned.

- (i) Candidates belonging to OBC category must submit photo copy of category certificate as per GOI, the format of the same is also available in the brochure, OBC Non-creamy layer certificate should have been issued after 31.03.2016 by a competent authority.
- (j) Persons with Different Abilities (PD) candidates should submit along with the filled Application, the certificate in original, from a Govt. Medical Board. However, such a candidate shall have to appear before a Medical Board duly constituted by IIT Roorkee for this purpose. The Medical Board will decide the programmes which cannot be offered to a candidate, on the basis of the nature of his/her disability. The candidate will be offered admission out of the remaining programmes as per the Institute policy also.
- (k) There is no age restriction for admission to a postgraduate programme.
- (l) In matters of interpretation of the provisions or any matter not covered herein this Information Brochure, the decision of the Chairman, Senate IIT Roorkee shall be final and binding on both the parties.

8.3 Number of Seats

The number of seats in each academic programme is given in **Table-1**. The Institute, however, reserves the right to alter the number of seats in any programme without prior notice.

8.4 Reserved Seats

Certain number of seats is reserved for candidates belonging to various categories. The details of the seats reserved (in percentage) under different categories at present as per the directives of the Govt. of India, are given in **Table-4**.

Table – 1

Details of Academic Programmes leading to M.Tech./M.Arch./M.U.R.P.

Sl. NO	Academic Department/ Centre & (Code)	Academic Programmes		No. of Seats	Minimum Educational Qualifications
		Code	Name		
1	Architecture and Planning (ARD)	10	M.Arch.	9	B.Arch. or its equivalent
		11	M.U.R.P.	9	B.Arch. or its equivalent or Bachelor's degree in Civil Engg./ B.Planning
2	Alternate Hydro Energy Centre (AHC)	12	M.Tech. Alternate Hydro Energy Systems	12	Bachelor's degree in Civil/Electrical/Mechanical/ Industrial/Chemical/Electronics/Computer/Agricultural/ Environmental Engg. or equivalent.
		13	M.Tech. Environmental Management of Rivers and Lakes	8	Bachelor's degree in Civil/Electrical/Mechanical/ Industrial/ Chemical/Agriculture/Environmental Engg./Biotechnology/Arch. /Town Planning or its equivalent or Master in Science in any subject with Mathematics at graduation level.
3	Chemical Engineering (CHD)	14	M.Tech. Computer Aided Process Plant Design	14	Bachelor's degree in Chemical/Biochemical/Pulp & Paper Engg./Chemical Technology/Petrochemical/ Polymer Technology/ Petroleum Refining or equivalent.
		15	M.Tech. industrial Pollution Abatement	14	Bachelor's degree in Chemical/Pulp & Paper Engg./Civil/Biochemical/Petroleum/Environmental Engg./Chemical Technology/ Polymer Technology or equivalent.
4	Civil Engineering (CED)	16	M.Tech. Environmental Engg.	9	Bachelor's degree in Civil Engg./Chemical Engg./Environmental Engg. or equivalent.
		17	M.Tech. Geomatics Engg.	12	Bachelor's degree in Civil Engg./Electronics Engg./Electrical Engg./Computer Science/ Information Technology/Marine Engg./Mining Engg./Environmental Engg./Agricultural Engg./ Communication Engg./Architecture or equivalent.
		18	M.Tech. Geotechnical Engg.	12	Bachelor's degree in Civil Engg./Mining Engg. or equivalent.
		19	M.Tech. Hydraulic Engg.	9	Bachelor's degree in Civil Engg. or equivalent.
		20	M.Tech. Structural Engg	18	Bachelor's degree in Civil Engg. or its equivalent.
		21	M.Tech. Transportation Engg.	12	Bachelor's degree in Civil Engg. or its equivalent.
5	Earthquake Engineering (EQD)	22	M.Tech. Soil Dynamics	9	Bachelor's degree in Civil/Structural Engg. or equivalent.
		23	M.Tech. Structural Dynamics	15	Bachelor's degree in Civil/Structural Engg. or equivalent.
		24	M.Tech. Seismic Vulnerability and Risk Assessment	8	Bachelor's degree in Civil/Structural Engg. or equivalent.
6	Electrical Engineering (EED)	25	M.Tech. Electric Drives & Power Electronics	12	Bachelor's degree in Electrical Engg. or its equivalent.
		26	M.Tech. Instrumentation and Signal Processing	12	Bachelor's degree in Electrical/Electronics & Communication/Instrumentation Engg. or equivalent.
		27	M.Tech. Power System Engg.	12	Bachelor's degree in Electrical Engg. or its equivalent.
		28	M.Tech. Systems and Control	12	Bachelor's degree in Electrical Engg. or Electronics & Communication/Instrumentation Engg. or equivalent.

Sl. NO	Academic Department/ Centre & (Code)	Academic Programmes		No. of Seats	Minimum Educational Qualifications
		Code	Name		
7	Electronics and Communication Engineering (ECD)	29	M.Tech. Communication Systems	9	Bachelor's degree in Electronics & Communication Engg. or its equivalent.
		30	M.Tech. R.F. & Microwave Engg	7	Bachelor's degree in Electronics & Communication Engg. or its equivalent.
		31	M.Tech. Microelectronics and VLSI	8	Bachelor's degree in Electronics & Communication Engg. or its equivalent. M.Sc. (Physics); M.Sc. (Electronics)
8	Computer Science and Engineering (CSD)	32	M.Tech. Computer Science & Engg.	27	B.E./B.Tech. degree in Computer Science & Engineering/ Information Technology
9	Hydrology (HYD)	33	M.Tech. Hydrology	9	Bachelor's degree in Civil/ Agricultural Engg./ Hydrology or equivalent. M.Sc./M.Tech. in Chemistry/Geology/ Geophysics/Applied Geology/Applied Geophysics/Physics/ Meteorology/ Geography Atmospheric Physics/Environmental Science with Mathematics in B.Sc. as one of the subjects or M.Sc. (Master's) degree in Statistics with Physics or Mathematics at B.Sc. or M.Sc. degree in Mathematics with Physics in B.Sc. or its equivalent.
10	Mechanical and Industrial Engineering (MED)	34	M.Tech. CAD, CAM & Robotics	8	Bachelor's degree in Mechanical/Industrial/Production Engg. or equivalent.
		35	M.Tech. Machine Design Engg.	9	Bachelor's degree in Mechanical/Industrial/Production Engg. or equivalent.
		36	M.Tech. Production & Industrial Systems Engg.	9	Bachelor's degree in Mechanical/ Industrial/Production Engg. or equivalent.
		37	M.Tech. Thermal Engg.	9	Bachelor's degree in Mechanical/Industrial/Production Engg. or equivalent.
		38	M.Tech. Welding Engg.	9	Bachelor's degree in Mechanical/Industrial/Production Engg. or equivalent.
11	Metallurgical and Materials Engineering (MTD)	39	M.Tech. Industrial Metallurgy	9	B.Tech./B.E. in Metallurgy/Materials Engineering/Mechanical Engineering/Production Engg/ Production and Industrial Engg
		40	M.Tech. Materials Engg.	9	B.Tech./B.E. in Metallurgy/Materials Engineering, Mechanical Engineering/Production Engineering/ Production and Industrial Engg /Ceramic Engineering; or M.Sc. in Physics/Chemistry with Mathematics course at B.Sc. level
12	Paper Technology Saharanpur Campus(PPD)	41	M.Tech. Pulp & Paper	9	Bachelor's degree in Pulp & Paper Engg./ Chemical Engg./ Mechanical Engg./ Polymer Engg./ Cellulose Technology/ Biotechnology or equivalent. Note: The two years post B.Sc. diploma awarded by the IPT/DPT plus a minimum of two years relevant experience in Industry/ Research Organization will be considered equivalent to a B.Tech/B.E. degree
		42	M.Tech Packaging Technology	10	M.Sc. in Chemistry(PCM at B.Sc. level)/ Polymer Science (PCM at B.Sc. level)/ or B.Tech. in Pulp and Paper Technology/ Biotechnology/ Chemical Engg Chemical Technology/ Polymer Engg/ Process Engg/ Mechanical Engg/ Production Engg/ Packaging Technology/Printing Technology/ Textile Technology/ PG Diploma in Packaging/ Biochemical Engg. Industry sponsored candidate with aforesaid academic qualifications along with two years experience in Paper/Polymer /Packaging Technology. Additional Requirement: GATE qualified except for industry sponsored candidate.

Sl. NO	Academic Department/ Centre & (Code)	Academic Programmes		No. of Seats	Minimum Educational Qualifications
		Code	Name		
13	Water Resources Development & Management (WRD)	43	M.Tech. Irrigation Water Management	2	Bachelor's degree in Civil Engg. or it's equivalent/ Agricultural Engg. or M.Sc. Agriculture in Agronomy, Soil Science, Agrometeorology, with Mathematics as one of the papers at the level of B.Sc./B.Sc. Agriculture.
		44	M.Tech. Water Resources Development	7	Bachelor's degree in Civil/Electrical/Mechanical/ Electronics & Telecommunication Engg. or equivalent.
14	Chemistry (CYD)	45	M.Tech. Advanced Methods of Chemical Analysis	8	B.Tech. (Chemical Engg.)/M.Sc.(Chemistry)/ M.Sc. (Environment Science) with Mathematics at least at 10+2 level.
15	Physics (PHD)	46	M.Tech. Solid State Electronic Materials	9	B.Tech. (Engg. Physics)/M.Sc. (Physics)/Bachelor's degree in Electrical/Electronics/Metallurgical Engg. or its equivalent.
		47	M.Tech. Photonics	9	M.Sc. (Physics/ Electronics/ Applied Physics/ Photonics/ Engineering Physics), B.Tech. (Engineering Physics/ Electronics/ Communication/ Electrical/ Instrumentation/ materials/ Metallurgy/ Nanotechnology)
16	Nanotechnology (NTC)	48	M.Tech. Nanotechnology	8	B.Tech. (Met. & Mat. Engg./Mech. Engg./E&C/Electronics/ Chemical Engg./Pulp & Paper/Biotechnology) or equivalent; M.Sc. (Physics/Chemistry/ Biotechnology), or equivalent with Mathematics at 10+2 or higher level.
17	Disaster Mitigation and Management (DMC)	49	M.Tech. Disaster Mitigation and Management	8	B.Tech. (Civil, Structural, Mechanical, Industrial, Chemical, and Engineering/Computer Science or equivalent, B.Arch. & B. Planning, or M.Tech. in Geological Technology and Geophysical Technology or equivalent, or M.B.A. or M.C.A. or M.Sc. in Physics/Geophysics/Geology/Mathematics,' Environmental Sciences (with Maths in B.Sc.) computer Science or equivalent.
18	Transportation Systems (TSC)	50	M.Tech. Infrastructure Systems	8	B.E./B.Tech. (Civil/ Mechanical & Industrial/ Electrical/ Chemical Engineering/Electronics & Communication Engg/ Computer Science and Information Technology/ B.Arch./ B.Planning or equivalent.
19	Biotechnology (BTD)	51	M.Tech. Bioprocess Engineering	8	B.E./B.Tech. or equivalent degree in Chemical Engineering/ Biochemical Engg/ Bioprocess Engg/ Chemical Technology/ Food Technology/ Agricultural Engg./ Biomedical Engg/ Bioengineering/ Polymer Engg./ Polymer Technology/ Plastic Technology/ Paper Technology/Ceramic Technology/ Petrochemical Engineering/ Textile Engineering/ Biotechnology or in allied field with maths in 10+2 level.

Notes: 1. The seats given above shall be available with MHRD assistantship. However, additional candidates sponsored by industry, QIP, foreign students, DRDO, Defense, Atomic Energy etc. may be admitted to these programmes without any assistantship. The Institute reserves the right not to fill the seats in any programme and may drop any programme.

2. **There is no seat available for sponsored candidates in Computer Science and Engineering Department other than Army and DRDO.**

3. The minimum duration of all academic programmes would be four semesters for Full-Time candidates and six semesters for Part-Time candidates.

Table -2
Details of eligible main GATE discipline and allied GATE discipline

S. No.	Academic Department/ Centre & (Code)	Academic Programmes		Main Gate Discipline(s)				Other GATE Disciplines					TA	
		Name	Code	GATE Discipline Code	GEN	OBC	SC	ST	GATE Discipline Code	GEN	OBC	SC		ST
1.	Architecture and Planning (ARD)	M.Arch.	10	AR(9)	5	2	1	1	-	-	-	-	-	3
		M.U.R.P.	11	AR(7)	3	2	1	1	CE(2)	1	1	0	0	2
2.	Alternate Hydro Energy Centre (AHC)	M.Tech. Alternate Hydro Energy Systems	12	CE(2)	1	1	0	0	AG/CH/EE/EC/ME/PI/XE (10)	5	3	1	1	3
		M.Tech. Environmental Management of Rivers and Lakes	13	CE(3)	1	1	1	0	AG/CH/EE/ME/PI/XE/AR/CY/BT/PH/MA/XL/EY(5)	2	1	1	1	2
3.	Chemical Engineering (CHD)	M.Tech. Computer Aided Process Plant Design	14	CH(14)	7	4	2	1	-	-	-	-	-	2
		M.Tech. industrial Pollution Abatement	15	CH(12)	6	3	2	1	CE(2)	1	1	0	0	2
4.	Civil Engineering (CED)	M.Tech. Environmental Engg.	16	CE(7)	3	2	1	1	CH(2)	1	1	0	0	2
		M.Tech. Geomatics Engg.	17	CE/MN (7)	3	2	1	1	AR/CS/EC/EE/AG(5)	2	2	1	0	2
		M.Tech. Geotechnical Engg.	18	CE/MN(12)	6	3	2	1	-	-	-	-	-	3
		M.Tech. Hydraulic Engg.	19	CE(9)	5	2	1	1	-	-	-	-	-	2
		M.Tech. Structural Engg	20	CE(18)	9	5	3	1	-	-	-	-	-	3
		M.Tech. Transportation Engg.	21	CE(12)	6	3	2	1	-	-	-	-	-	2
5.	Earthquake Engineering (EQD)	M.Tech. Soil Dynamics	22	CE(9)	5	2	1	1	-	-	-	-	-	2
		M.Tech. Structural Dynamics	23	CE(15)	8	4	2	1	-	-	-	-	-	3
		M.Tech. Seismic Vulnerability and Risk Assessment	24	CE(8)	4	2	1	1	-	-	-	-	-	2
6.	Electrical Engineering (EED)	M.Tech. Electric Drives & Power Electronics	25	EE(12)	6	3	2	1	-	-	-	-	-	3
		M.Tech. Instrumentation and Signal Processing	26	EE(7)	3	2	1	1	EC/IN(5)	3	1	1	0	2
		M.Tech. Power System Engg.	27	EE(12)	6	3	2	1	-	-	-	-	-	3
		M.Tech. Systems and Control	28	EE(9)	5	2	1	1	EC/IN(3)	1	1	1	-	2
7.	Electronics and Communication Engineering (ECD)	M.Tech. Communication Systems	29	EC(9)	5	2	1	1	-	-	-	-	-	3
		M.Tech. R.F. & Microwave Engg	30	EC(7)	3	2	1	1	-	-	-	-	-	2
		M.Tech. Microelectronics and VLSI	31	EC(8)	4	2	1	1	-	-	-	-	-	2
8.	Computer Science and Engineering (CSD)	M.Tech. Computer Science & Engg.	32	CS(27)	14	7	4	2	-	-	-	-	3	

S. No.	Academic Department/ Centre & (Code)	Academic Programmes		Main Gate Discipline(s)				Other GATE Disciplines					TA	
		Name	Code	GATE Discipline Code	GEN	OBC	SC	ST	GATE Discipline Code	GEN	OBC	SC		ST
9.	Hydrology (HYD)	M.Tech. Hydrology	33	CE/AG(7)	3	2	1	1	GG/XE/PH/EY(2)	1	1	0	0	3
10.	Mechanical and Industrial Engineering (MED)	M.Tech. CAD, CAM & Robotics	34	ME/PI(8)	4	2	1	1	-	-	-	-	-	2
		M.Tech. Machine Design Engg.	35	ME/PI(9)	5	2	1	1	-	-	-	-	-	3
		M.Tech. Production & Industrial Systems Engg.	36	ME/PI(9)	5	2	1	1	-	-	-	-	-	3
		M.Tech. Thermal Engg.	37	ME/PI(9)	5	2	1	1	-	-	-	-	-	2
		M.Tech. Welding Engg.	38	ME/PI(9)	5	2	1	1	-	-	-	-	-	2
11.	Metallurgical and Materials Engineering (MTD)	M.Tech. Industrial Metallurgy	39	MT(2)	1	1	0	0	ME/PI/XE (7)	3	2	1	1	2
		M.Tech. Materials Engg.	40	MT(2)	1	1	0	0	PH/ME/PI/CY/XE (7)	3	2	1	1	2
12.	Paper Technology Saharanpur Campus (PPD)	M.Tech. Pulp & Paper	41	CH(5)	2	1	1	1	ME/BT/TF/EY (4)	2	1	1	0	3
		M.Tech. Packaging Technology	42	CH(5)	2	1	1	1	BT/CY/ME/TF (5)	3	1	1	0	2
13.	Water Resources Development and Management (WRD)	M.Tech. Irrigation Water Management	43	CE/AG(2)	1	1	0	0	-	-	-	-	-	3
		M.Tech. Water Resources Development	44	CE/EE/ME (7)	3	2	1	1	-	-	-	-	-	2
14.	Chemistry (CYD)	M.Tech. Advanced Methods of Chemical Analysis	45	CY/CH(8)	4	2	1	1	-	-	-	-	-	2
15.	Physics (PHD)	M.Tech. Solid State Electronic Materials	46	PH(6)	3	1	1	1	EE/EC/MT (3)	1	1	1	0	1
		M.Tech. Photonics	47	PH(6)	3	1	1	1	EE/EC/MT/IN (3)	1	1	1	0	1
16.	Nanotechnology (NTC)	M.Tech. Nanotechnology	48	MT/ME/EC/CH (3)	1	1	1	0	CY/PH/BT/XL (5)	2	1	1	1	2
17.	Disaster Mitigation and Management (DMC)	M.Tech. Disaster Mitigation and Management	49	CE/ME/PI/CS/CH/AR/GG/PH/MA/XL/XE/EY (8)	4	2	1	1	-	-	-	-	-	2
18.	Transportation Systems (TSC)	M.Tech. Infrastructure Systems	50	CE(3)	1	1	1	0	ME/PI/CH/EE/EC/CS/AR (5)	2	1	1	1	2
19.	Biotechnology (BTD)	M.Tech. Bioprocess Engineering	51	CH (3)	1	1	1	0	BT/AG/XE/TF (5)	2	1	1	1	2

Codes of GATE disciplines are given below:

GATE Discipline	Code	GATE Discipline	Code	GATE Discipline	Code
Aerospace Engg.	AE	Electronics & Comm. Engg.	EC	Mining Engg.	MN
Agricultural Engg.	AG	Electrical Engg.	EE	Petroleum Engineering	PE
Architecture and Planning	AR	Ecology and Evolution	EY	Physics	PH
Biotechnology	BT	Geology & Geophysics	GG	Production & Industrial Engg.	PI
Civil Engg.	CE	Instrumentation Engg.	IN	Textile Engg. and Fibre Sci.	TF
Chemical Engg.	CH	Mathematics	MA	Engineering Sciences	XE
Computer Science & Information Tech.	CS	Mechanical Engg.	ME	Life Sciences	XL
Chemistry	CY	Metallurgical Engg.	MT		

Table-3**Conversion between Grade Point Average and Marks for the Purpose of Eligibility Check**

Marks	10 point scale		9 point scale		6 point scale		5 point scale		4 point scale	
	CGPA	% Mrks	CGPA	% Mrks	CGPA	% Mrks	CGPA	% Mrks	CGPA	% Mrks
40	4.00	40	3.45	38.33	2.30	38.33	2.00	40	1.62	40.50
45	4.50	45	3.90	43.33	2.55	42.50	2.25	45	1.80	45.00
50	5.00	50	4.37	48.56	2.85	47.50	2.50	50	1.98	49.50
55	5.50	55	4.78	53.11	3.19	53.17	2.75	55	2.13	53.25
60	6.00	60	5.34	59.33	3.56	59.33	3.00	60	2.38	59.50
65	6.50	65	5.76	64.00	3.85	64.17	3.25	65	2.55	63.75
70	7.00	70	6.19	68.78	4.13	68.83	3.50	70	2.75	68.75
75	7.50	75	6.70	74.44	4.45	74.17	3.75	75	2.95	73.75
80	8.00	80	7.15	79.44	4.75	79.17	4.00	80	3.16	79.50
85	8.50	85	7.60	84.44	5.05	84.17	4.25	85	3.35	83.75
90	9.00	90	8.05	89.44	5.35	89.17	4.50	90	3.58	89.50
95	9.50	95	8.50	94.44	5.70	95.00	4.75	95	3.80	95.00
100	10.00	100	9.00	100.00	6.00	100.00	5.00	100	4.00	100.00

Table-4
Reservation of Seats for Different Categories

SI.No.	Category	Seats reserved
1	Scheduled Castes (SC)	15%
2	Scheduled Tribes (ST)	7.5 %
3	Other Backward Classes	27%
4	Persons with Disability (including leprosy-cured)	3% (Horizontal)

Notes:-

- (1) **The provisions for reservation of seats given above are subject to modification in accordance with any Govt. Order, if issued subsequently by the Govt. of India.**
- (2) It will entirely be the responsibility of the candidate to prove his/her eligibility in terms of minimum educational qualifications and for claiming reservation under a specific category, if any, at the time of counseling and thereafter.
- (3) **Candidate must ensure that he/she possesses the required eligible qualification and has valid Normalized GATE marks in the required discipline.**

8.5 Application Process

For admission to PG programmes 2017, candidates need to register and fill the application ONLINE only by accessing <http://pgadm.iitr.ernet.in> from March 28, 2017 to April 18, 2017. After finalizing the application and depositing the fee online, the filled application needs to be downloaded. The application process is completed only when a print out of the filled ONLINE application with the candidate's signature and a good quality photo affixed in the appropriate places is sent to the PG Admission office, IIT Roorkee, Roorkee on or before **April 21, 2017**.

8.5.1 Application Fee

For General/OBC Category : Rs. 400/- + *Rs. 100/-
For PD/SC/ST Category : Rs. 200/- + * Rs. 100/-
***Rs. 100/- for each additional department**

The requisite fee can be paid online using net banking or debit/credit card facilities. Additional charges will be applicable as per the rule of the concerned bank.

The Fee will not be accepted through any other mode.

8.5.2 How to Apply

Before applying, candidates are advised to read the PG Information Brochure 2017 carefully.

Step 1: Apply for PG Programmes

- a) Register
- b) Login
- c) Apply online
- d) Finalize Application Form

- e) Pay fee online using option "Proceed for Payment" (as given in section 8.5.1)
- f) Download and print of the completed Application Form

Step 2: Photograph and Signature

Paste your recent photograph (3.5 cm X 3.5 cm) in the designated place. Sign at the designated place.

Step 3: Post/Submission

Before posting your application form, make sure that, in addition to the other relevant attachments, make sure to add the following:

- Xerox copy/Downloaded copy of GATE Score Card
- Proof of Mathematics at 10+2 as applicable.
- Copy of the degree certificate or provisional certificate if they have passed their qualifying degree.
- Copy of OBC/SC/ST/PD category certificate (if any)
- Annexure 1-5 as applicable.

Duly signed downloaded online Application with appropriate enclosures must be sent by Speed Post (preferably) or by Registered Post in A4 size envelope to PG ADMISSION OFFICE, INDIAN INSTITUTE OF TECHNOLOGY ROORKEE, ROORKEE-247667, so as to reach this office on or before April 21, 2017

It can also be handed over personally to the PG ADMISSION Office, IIT Roorkee, Roorkee on or before April 21, 2017.

8.6 Scholarships/Assistantship

- Assistantship @ Rs. 12400/- per month may be awarded to GATE qualified candidates as per norms for the duration of the programmes i.e. two years to the full time students for M.Tech./M.Arch./M.U.R.P. within the sanctioned intake excluding sponsored candidates. The number of assistantships in each programme will be as per guidelines of MHRD as given in **Table-1 (Note-1)**. However, GATE qualified candidates do not automatically become eligible for the sanction of this assistantship.
- B.Tech. degree holders from any IIT with minimum CGPA of 8.00 on a 10 point scale and given admission without GATE are also eligible for MHRD assistantship.
- **Scholarship under M.Tech (Teaching Assistantship) Programme**
 As per the guidelines issued by the MHRD, 96 scholarships under M.Tech. (Teaching Assistance) programme will be allocated to the IIT Roorkee over and above intake of the institute. These students shall be selected from the best GATE scores and shall be entrusted with the teaching work as decided by the institution. They would be paid scholarship of Rs. 25000/- per month for a maximum of 24 months. The process of selection shall be in accordance with guidelines issued by the Ministry in this regard.
- Scholarship/Assistantship will not be awarded to those who are in receipt of salary from any source. However, teacher

candidates may be granted scholarship/assistantship in addition to the study leave benefits provided that they are not in receipt of any deputation allowance from their employer, in addition to the study leave salary as per norms.

- The continuance of the assistantship/scholarship to a student shall depend upon his/her satisfactory progress report of work, attendance, conduct and the academic performance (SGPA/CGPA), as per Ordinances/Regulations in vogue.
- Under MoU with the Department of Atomic Energy, the candidates qualifying under Department of Atomic Energy Graduate Fellowship Scheme may be admitted to M.Tech. programmes. The details of the scheme may be obtained from www.hrdbarc.gov.in
- Some foreign scholarships may be available to selected M.Tech. students for doing their dissertation under exchange programmes such as DAAD Sandwich Model Programme of Germany, programme of KTH, Sweden, Macquarie University, Australia etc.

9. SELECTION AND ADMISSION

9.1 Basis of Selection for Admission

Admission will be made on the basis of either Normalized GATE marks only or Normalized GATE marks and Interview/Written Test. For Sponsored candidates the admission will be made on the basis of Interview/Written Test and relevant experience. The cut off for calling the full time regular candidates for Interview/Written Test and for preparing merit list will be based on Normalized GATE marks for different programmes for different categories of candidates.

Admission will be made strictly in order of merit and the preferences for the programmes given by a candidate in his/her Application. The basis for determining candidate's merit position is given in **Table-5**.

Table-5
Basis for Selection

Candidate's Status	Basis for Selection
Regular candidates GATE qualified	Valid Normalized GATE marks only or Valid Normalized GATE marks alongwith Interview/ Written Test
Regular B.Tech. degree holders from the IITs without GATE score	CGPA ≥ 8
Sponsored candidates(Full Time and Part Time)	Interview/Written Test & Relevant Experience

The candidates having B.Tech. degree from any IIT with CGPA ≥ 8 will be given direct offer without GATE requirement upto 10% of the sanctioned intake in a programme.

The number of candidates to be called for Counselling/Interview/Written Test, in different categories, shall be decided by the PG Admission Committee with a cut off equal to or higher than the minimum cut off decided on Normalized GATE marks at Institute level for all PG programmes separately. The merit list of candidates shall be based on 70%

Normalized GATE marks and 30% Interview/Written Test marks. For those programmes where no Interview/Written Test is required, the merit list will be based on 100% Normalized GATE marks of the candidates.

In case sum total of Normalized GATE Marks and Interview/Written Test of the candidates becoming equal, preference will be given to the candidate securing higher marks in the Interview/Written Test conducted at IIT Roorkee and thereafter in the qualifying examination.

9.2 Criteria and Schedule of Interview/Written Test/ Counselling

The Interview/Written Test wherever required will be conducted by different Departments/Centres at IIT Roorkee Campus. The admission criteria for different Department/Centre are given in **Table-6**.

Table – 6

Department	Admission Criteria
Arch. & Plang.	70% Normalized GATE marks and 30% Interview
AHEC	70% Normalized GATE marks and 30% Interview
Biotechnology	70% Normalized GATE marks and 30% Interview
Chemical Engg.	Only Normalized GATE marks
Civil Engg.	Only Normalized GATE marks
Earthquake Engg	Only Normalized GATE marks
Electrical Engg.	Only Normalized GATE marks
E & C E	Only Normalized GATE marks
Computer Science & Engg	Only Normalized GATE marks
Hydrology	Only Normalized GATE marks
Mech.& Ind. Engg.	Only Normalized GATE marks
Met. & Mat. Engg.	Only Normalized GATE marks
Paper Technology#	70% Normalized GATE marks and 30% Written Test
WRD&M	70% Normalized GATE marks and 30% Interview
Chemistry	70% Normalized GATE marks and 30% Interview
Physics	Only Normalized GATE marks
Nanotechnology	Only Normalized GATE marks
Disaster Mitigation & Management	70% Normalized GATE marks and 30% Interview
Transportation Systems	70% Normalized GATE marks and 30% Interview

Note: The interview/written test shall be conducted for sponsored category candidates in all departments except Computer Science and Engg on May 31, 2017.

Written Test for Paper Technology Department will be held at Roorkee campus.

Declaration of Merit List

The Merit List after the Written Test/Interview will be declared on June 01, 2017.

The Merit List and Waiting List after Counselling will also be available on the Institute Website: www.iitr.ac.in or <http://pgadm.iitr.ernet.in>

The candidate will have to accept the offer and deposit the requisite fee or the waitlisted amount or decline the offer at the time of counselling.

The offer of admission will be provisional subject to submission of all required documents and fee by the specified dates.

9.3 Offer of Admission

The candidates will be offered admission in the following manner:

1. Candidates will be given offer after counselling according to merit list prepared based on either Normalized GATE marks only or Normalized GATE marks alongwith Interview/Written Test, as applicable.
A waiting list will also be prepared for the rest of the candidates as per the merit for each department provided they deposit requisite fee at the time of counselling and will also treat them as wait listed candidates for rest of the choices.
2. The vacant seats, if any, will only be filled from amongst the waitlisted candidates.
3. Just after the date of Registration, if there is any vacancy, it will be filled through final counselling to be scheduled on July 24, 2017 from amongst the remaining waitlisted candidates.

The candidates will be offered admission in a programme as per merit and their preferences given in Application.

The candidates offered admission will have to deposit Institute fee and processing fee at the time of counselling. Rest of the candidates will be required to deposit Institute Fees and Processing Fees to get themselves waitlisted. This amount will be adjustable later on against the Institute fee at the time of registration. In case of non-acceptance of the offer by a waitlisted candidate by a specified date, the processing fee will only be retained and rest will be refunded. Further, if institute is not able to offer admission to a waitlisted candidate, the entire amount will be refunded.

Procedure for Up-gradation

Up-gradation will be done automatically only for higher preferences as filled by the candidate in Application Form on the basis of merit prepared after the Interview/Written Test and normalized GATE marks whichever is applicable, availability of seats in respective category/programme. This process will continue till last date of Registration. Thereafter no up-gradation will be allowed even if a vacancy exists. However, candidate shall have an option in writing at the time of counselling whether he/she would like to freeze the seat allotted and do not want further up-gradation. In case such option is not given it will be presumed that the candidate is interested in upgradation and thereafter no such request be entertained.

9.4 Fee/Dues

The existing Institute fee/dues for various programmes are given in **Table-7**. Any further details of the fee may be obtained from the Deputy Registrar (Academics), IIT Roorkee.

The fee structure given in **Table-7** is provisional and may be modified by the Institute as and when necessary, without intimation. Mess Advance of Rs. 18400/-. The fee can be revised as per the guidelines of MHRD from time to time.

Table-7
Institute Fee* to be Deposited for Admission

S.No	Particulars	Amount
1	Semester fee: (a) Tuition Fee (b) Other Fee (c) Hostel Fee	Rs. 5,000/- Rs. 4,600/- Rs. 8,000/-
2.	One Time Fee	Rs. 3,400/-
3.	Yearly Fee for Group Insurance Scheme, Bhawan fund	Rs. 100/-
4.	Medical Insurance fee	Rs.380/-
5.	Refundable Deposits	Rs.3,000/-
	Total:	Rs. 24,480/-

Tuition Fee for Sponsored Candidates is Rs. 25,000/- per semester

* Tentative and subject to change.

Note:(1) Hostel Fee Rs. 8000/- and Mess Charges Rs. 18400/- per semester will be extra.

(2) Tuition fee is not chargeable from SC/ST students.

9.5 Registration

A system of registration is followed for all the students joining the Institute. The selected candidates will have to register themselves **personally** on the date and time to be intimated to them. At the time of registration, the candidate is required to fill-up the registration cards and get himself/herself registered. After registration, students should report to the concerned Head of the Department/Centre and submit the joining report. The proof of joining the Institute shall be the registration card and the fee receipt. Scholarship/Assistantship will be granted only after receiving the joining report from the departments/centre and the undertaking as per the Institute norms (wherever applicable). Regular classes will start from the next working day as per the time schedule declared by the Institute. The candidates selected for admission to M.Tech. (P&P and Packaging Technology) shall have to report to the Head, Department of Paper Technology, Saharanpur (Campus) after registration.

9.6 Documents at the Time of Registration

The candidates admitted to various PG programmes of study must present themselves for the registration **in person** along with the following documents as per the schedule specified by the Institute:

- The letter from the Institute offering admission.
- The original and self attested copy of marks-sheet of the qualifying examination showing essential requirements. In case, the result for the qualifying examination has not been declared at the time of admission the same may be submitted till September 30, 2017. Under such circumstances, the admission will remain provisional until the candidate is able to submit the results indicating successful completion of the requirements of his/her qualifying degree, with the specified minimum percentage of aggregate marks/CGPA, by the specified date failing which the admission shall automatically be cancelled.
- The original and self attested copies of certificate and marks-sheet of High School or equivalent examination
- The original and self attested copy of GATE Score Card for GATE qualified candidates.

- A certificate from the College/University authority where from the candidate has to appear for the qualifying degree examination is given in **Annexure-1**.
- Relevant certificate(s) for Sponsored candidates are given in **Annexures-2 & 3** as applicable.
- The category certificate of SC/ST/OBC, in original (along with an self attested copy), issued by a competent authority (list given in **Annexure-4**).
- **A certificate from the candidate registered without production of proof of passing the qualifying examination/appeared in the backpaper(s)/ supplementary(ies) till date of registration on Annexure-5**
- A certificate from the Government Medical Board to support the PD status, if applicable.

9.7 Cancellation of Admission/Programme

The Institute reserves the right to cancel, at any stage, the admission of a candidate admitted to a programme and is later found that he/she is not entitled, being unqualified or ineligible in accordance with the Ordinances and Regulations in vogue, or suspension/termination of programme.

9.8 Matters of Dispute

Disputes, if any, arising out of or relating to any matter whatsoever shall be subject to the exclusive jurisdiction of the Roorkee Courts.

9.9 Ragging

Ragging is banned in the Institute and anyone indulging in ragging is likely to be punished appropriately and the punishment may include expulsion from the institution, suspension from the institution or classes for a limited period, or fine with a public apology. The punishment may also take the shape of: (i) withholding of scholarships or other benefits, (ii) debarring from representation in events, (iii) withholding of results, (iv) suspension, rustication or expulsion from hostel or mess, (v) monetary fine etc.

10. CATEGORY CODES

Category Codes for candidates of General and reserved categories are given below in **Table-8**:

Table-8

Category	Code
General	GEN
Other Backward Classes	OBC
Scheduled Caste	SC
Scheduled Tribe	ST
Persons with Different Abilities	PD

11. DEPARTMENT/CENTRE CODES

The codes of all the Departments/Centres are given in **Table-9**.

Table-9
Code of Departments/Centres

S.No.	Name of the Department/Centres	Code
1.	Alternate Hydro Energy Centre	AHC
2.	Architecture & Planning	ARD
3.	Biotechnology	BTD
4.	Chemistry	CYD
5.	Chemical Engg.	CHD
6.	Civil Engg.	CED
7.	Centre for Disaster Mitigation & Management	DMC
8.	Centre for Transportation Systems	TSC
9.	Earthquake Engg.	EQD
10.	Computer Science and Engg.	CSD
11.	Electrical Engg.	EED
12.	Electronics and Communication Engg.	ECD
13.	Hydrology	HYD
14.	Mechanical and Industrial Engg.	MED
15.	Metallurgical and Materials Engg.	MTD
16.	Nanotechnology	NTC
17.	Physics	PHD
18.	Paper Technology	PPD
19.	Water Resources Development and Management	WRD

12. GENERAL INFORMATION

a. Amount of Application Fee Including Fee for Additional Departments

If admission is sought in more than one department/centre, the fee will be Rs.400/- (General and OBC Category) or Rs.200/- (SC/ST/PD category) plus Rs.100/- per additional deptt.

b. Mailing Address

Complete mailing address needs to be provided by the applicant including NAME, C/o (if any), House No./Street, Mohalla/Village, Post Office, City and its PIN CODE number. This address will be used for the dispatch of Admission Offer Letter, counselling letter etc. Also, e-mail ID, if any may be provided in the space provided and the **Telephone No., Fax No.**, if available, including **STD code** through which she/he may be contacted.

c. Declaration by the Candidate

The declaration is to be signed by the candidate. The place and date are to be filled in the places marked for this purpose. Unsigned Application Forms will not be considered.

d. Signature of the Candidate

The application should necessarily be signed by the applicant in the space provided for the purpose.

e. Photograph

A recent 3.5 cm x 4.5 cm, good quality colour photograph is to be pasted on the downloaded application. The photograph must not be larger than the space (box) provided for pasting it. The candidates are advised to have some spare copies of this photograph with them. The photograph must not be attested.

Notes:-

- (a) Options filled by the candidate in the form are final and cannot be changed at a later stage.
- (b) It should be noted that the applicants name, father's name and date of birth should be exactly the same as in the mark-sheet of pre-final year or final year examination of the qualifying degree. Any departure, whenever discovered, may lead to cancellation of candidature.
- (c) The application must be complete in all respects. Incomplete Application Form will be summarily rejected.

13. CHECK LIST OF DOCUMENTS SUBMITTED WITH THE APPLICATION FORM

It is advised to check the documents to be submitted with the downloaded application against the list given below, before sealing the envelope for sending it to the PG Admission Office, IIT Roorkee.

1. The Application duly signed and completed in all respects.
2. A copy of the GATE SCORE CARD for GATE qualified candidates.
3. A self attested copy of the final marks sheet/CGPA for the qualifying degree.
4. Certificate from the forwarding officer from those candidates who have yet to appear in the final examination as per **Annexure-1**.
5. A self attested copy of the sponsorship certificate for sponsored candidates in the format provided in **Annexure-2**.
6. A self attested copy of the No Objection certificate for part-time candidates in the format provided in **Annexure-3**.
7. A self attested copy of the category certificate for SC/ST/OBC candidates, issued by a competent authority (list given in **Annexure-4**).
8. Undertaking by the candidate registered without production of proof of passing the qualifying examination/appeared in the backpaper(s)/supplementary(ies) till date of registration as per **Annexure-5**.
9. A self attested copy of the certificate from the Govt. Medical Board to support the persons with different abilities (PD) candidates, if applicable.

**CERTIFICATE FOR APPEARING IN THE FINAL SEMESTER/YEAR EXAMINATION
(Required from candidates who are yet to appear in the qualifying examination)**

In connection with the application of Mr./Ms. for admission to PG programme(s) at IITR, I hereby certify that he/she is a bonafide student of our institution. He/She is yet to complete the requirements of qualifying examination including theory, practical project examination and backpaper(s)/supplementary(ies) for B.E./B.Tech./M.Sc./..... **which is to be scheduled later on**(Strike out the non-applicable ones and write in the blank space if the degree is not mentioned) and the result is likely to be announced by 2017. The percentage of aggregate marks/CGPA obtained by him/her upto prefinal year examination isHis/her conduct and character during his/her stay at the Institute/University has been "GOOD".

Place:
Date:

Signature of the Principal/Dean/Registrar/
Dy. Registrar/Proctor/Administrative Officer/
Asstt. Registrar of the institute attending/last attended with seal

Annexure-2

**SPONSORSHIP CERTIFICATE
(Required from full-time sponsored candidates only)**

The undersigned is pleased to sponsor Mr./Ms. who is working in this organization for the last years and is presently holding the rank/position of for pursuing the PG programme (course) at IIT Roorkee in the Department of with specialization in the following areas:

1. 2. 3. 4.

His/her conduct and character has been good.

The Institution/Organization would relieve him/her immediately for joining the above course, if selected for admission. The Institution/Organization also agrees to pay the contingent/all expenses stipulated by the Institute. This is further certified that the sponsorship for admission will not be withdrawn midway till completion of the course. Our enterprise is registered in a stock exchange/had an annual turn over of over Rs. 5.0 crores in the past two years (for candidates working in a Firm/Company/Industry).

Place:
Date:

Signature of Head of the Institution/Organization with seal
Name

Designation

Annexure-3

**NO OBJECTION CERTIFICATE
(Required from candidates seeking admission on part-time basis)**

The undersigned is pleased to permit Mr./Ms. who is working in this organization for the last years and is presently holding the rank/position of for pursuing the PG programme (course) at IIT Roorkee in the Department of with specialization in the following areas:

1. 2. 3. 4.

His/her conduct and character has been good.

The Institution/Organization would relieve him/her immediately for joining the above course, if selected for admission. If admitted the candidate will be permitted to be present at the Institute as required by the academic schedule for a period of three years and will continue to remain in service of this organization for the duration of the course.

Place:
Date:

Signature of Head of the Institution/Organization with seal
Name

Designation

Annexure-4

AUTHORITIES WHO CAN ISSUE CASTE/TRIBE CERTIFICATE

SC/ST/OBC candidates should submit certificate issued by any of the following authorities:

District Magistrate/Additional District Magistrate/Collector/Deputy Commissioner/Additional Deputy Commissioner/Deputy Collector/1st Class Stipendiary Magistrate/City Magistrate/Sub-Divisional Magistrate/Taluka Magistrate/Executive Magistrate/Extra Assistant Commissioner/Chief Presidency Magistrate/Additional Chief Presidency Magistrate/Presidency Magistrate/Revenue Officer not below the rank of Tehsildar/Sub-Divisional Officer of the area where the candidate and/or his/her family normally resides/Administrator/Secretary to Administrator/Development Officer (Lakshadweep Island).

(Certificate issued by any other authority will not be accepted.)

Annexure-5

UNDERTAKING BY THE CANDIDATE REGISTERED WITHOUT PRODUCTION OF PROOF OF PASSING THE QUALIFYING EXAMINATION/APPEARED IN THE BACKPAPER(S)/SUPPLEMENTAR(IES) TILL DATE OF REGISTRATION

I, son /daughter/ward of Mr./Ms..... hereby give an undertaking that I have appeared in all the examinations including practicals/projects/theory/backpaper(s)/supplementary(ies) before the date of registration which is to be scheduled later on and only result is awaited, which is likely to declare

Place:
Date:

Signature
Name
Address