INDIAN INSTITUTE OF TECHNOLOGY (BANARAS HINDU UNIVERSITY) VARANASI – 221 005

Information Brochure for Admission to M.Tech., M.Pharm. and Ph.D. Programmes for Odd Semester of the Academic Session 2018-19

The P.G. programmes of the Indian Institute of Technology (Banaras Hindu University), Varanasi are aimed at training manpower with sound theoretical and experimental background in frontier areas of research in the engineering, sciences and interdisciplinary subjects. The emphasis is on understanding the scientific basis and engineering principles involved in solving problems of practical importance in the relevant field using multidisciplinary approach. An important component of these programmes is to inculcate the habit of independent thinking and initiative by the candidates in planning and execution of the research work. These programmes seek to train manpower of the highest quality to cater to the needs of industry, R & D organizations and educational institutions.

The Institute has ten Engineering three Science and a Humanistic Studies Departments and three Interdisciplinary Schools which offer PG programmes in the respective disciplines. Joint registrations for Ph.D. programme involving more than one department/ school are encouraged to promote multi-disciplinary research.

Duly filled-in on-line applications on the prescribed form on our website are invited for admission to M.Tech./ M.Pharm./ Ph.D. programmes for registration in July 2018 Semester of session 2018-19 in various disciplines as given in **Annexure–I** and **II**. Candidates whose qualifying examination results are not declared at the time of written test / interview may also be considered. In case such candidates are selected, their admission will be provisional subject to the condition that they produce proof of completing all the examinations including the project/thesis examination and the viva voce before the date of registration. Such candidates are required to produce the evidence of their having passed the qualifying degree examination with the minimum marks/grades for eligibility by the last date for document submission as mentioned in the academic calendar (usually about 8 weeks from the date of registration), failing which their admission shall be cancelled.

All forms mentioned in this document are made available on the admission portal. Please use the links provided in the instructions given therein.

ELIGIBILITY CONDITIONS

M.Tech./M.Pharm. Programmes

Candidates who possess the requisite qualifications as indicated in **Table 1A** of ***Annexure - I*** are eligible for admission to postgraduate programmes in the respective Departments/ Schools of the Institute leading to M.Tech./M.Pharm. degree. The candidates should have secured a minimum of 60% marks / 6.0 CPI (on a 10.0 point scale) in the qualifying degree. In addition, they must have qualified in the Graduate Aptitude Test in Engineering (GATE) for M.Tech. Programmes & Graduate Pharmacy Aptitude Test (GPAT) for M.Pharm. Programme with validity not expired.

The number of seats available for M.Tech./M.Pharm. Programmes are given in **Table 1B** of ***Annexure-I***.

Ph.D. Programmes

Applicants must have the requisite qualification with minimum marks/CPI as mentioned below in the discipline concerned or in an allied discipline/area. A list of allied disciplines and research areas currently available for Ph.D. Programmes is given in **Table 2A** and **2B** respectively of ***Annexure – II***. The number of seats available for Ph.D. Programmes in different disciplines are given in **Table 2C** of ***Annexure-II***.

No student shall be admitted without any form of financial assistantship. No student can get financial assistance from more than one source at a time.

Ph.D. in Engineering

a) Applicants with master's degree in engineering in the discipline concerned or in an allied discipline/area must have a minimum of 60% marks or 6.0 CPI (on a 10.0 point scale) at the master's degree level.
b) Applicants with bachelor's degree in engineering in the discipline concerned or in an allied discipline/area must have a minimum of 75% marks or 7.5 CPI (on a 10.0 point scale) at the bachelor's degree level.
c) Applicants with master's degree in science as an allied discipline/area (where science is an allied discipline/area), must satisfy each of the following criteria:
   (i) A minimum of 65% marks or 6.5 CPI (on a 10.0 point scale) at the master's degree level,
   (ii) A minimum of 60% marks or 6.0 CPI (on a 10.0 point scale) at the bachelor's degree level.

Ph.D. in Pharmacy

a) Applicants with master's degree in pharmacy or in an allied discipline/area must have a minimum of 60% marks or 6.0 CPI (on a 10.0 point scale) at the master's degree level.
b) Applicants with bachelor's degree in pharmacy must have a minimum of 75% marks or 7.5 CPI (on a 10.0 point scale) at the bachelor's degree level.

Ph.D. in Sciences

a) Applicants with master's degree in science in the discipline concerned or in an allied discipline/area must have a minimum of 60% marks or 6.0 CPI (on a 10.0 point scale) at the master's degree level.
b) Applicants with four year bachelor's degree in Science in the discipline concerned or in an allied discipline/area must have a minimum of 75% marks or 7.5 CPI (on a 10.0 point scale) at the bachelor's degree level.

Ph.D. in Humanistic Studies

a) Applicants with Master's degree in relevant subject or allied subjects with a minimum CPI of 6.00 on a 10.0 point scale (or 60% marks) in the qualifying degree.
b) Applicants with Master's degree in Science or allied subjects with a minimum CPI of 6.00 on a 10.0 point scale (or 60% marks) in the qualifying degree.
c) Applicants with Bachelor's degree in Engineering or Sciences (4-Year program) with a minimum CPI of 7.50 on a 10.0 point scale (or 75% marks) in the qualifying degree.

Interdisciplinary Programmes

a) **Ph.D. in Systems Engineering**
   Applicants with a bachelor's and master's degree in any branch of Engineering must have a minimum of 60% marks or 6.0 CPI (on a 10.0 point scale) at the master's degree level.
   Applicants with bachelor's degree in any branch of engineering must have a minimum of 75% marks or 7.5 CPI (on a 10.0 point scale) at the bachelor's degree level.

b) **Ph.D. in Industrial Management**
   Applicants with bachelor's degree in any branch of engineering and master's degree in any branch of engineering/ management must have a minimum of 60% or 6.0 CPI (on a 10.0 point scale) at the master's degree level.
   Applicants with bachelor's degree in any branch of engineering must have a minimum of 75% marks or 7.5 CPI (on a 10.0 point scale) at the bachelor's degree level.

c) **Ph.D. in Bio-chemical Engineering/Bio-medical Engineering/Materials Science and Technology**
   Applicants with master's degree in the discipline concerned or in an allied discipline must have a minimum of 60% or 6.0 CPI (on a 10.0 point scale) at the master's degree level.
   Applicants with bachelor's degree in the discipline concerned or in an allied discipline must have a minimum of 75% marks or 7.5 CPI (on a 10.0 point scale) at the bachelor's degree level.

Admission to Ph.D. Programme for Candidates having National-level Scholarships

There is a provision for admission to Ph.D. programmes for candidates who fulfill the eligibility criteria for the respective programmes and also have qualified in any of the national level JRF/SRF tests conducted by UGC, CSIR, Department of Biotechnology, Indian Council of Medical Research or DST-INSPIRE fellowship or Dr. K.S. Krishnan Fellowship of DAE, etc.

Admission for candidates who come through QIP Programme

The Institute is now recognized as Major QIP Center of AICTE for research in all disciplines available. For a detailed procedure applicants should contact the AICTE.

Admission under External Registration category

A candidate working in an external R&D organization or in an industry recognized by the Institute (the list of external R&D organizations and industries recognized by the Institute is given in ***Annexure – III***), which is equipped with necessary research and library facilities can also apply for admission to Ph.D. programmes, provided he/she satisfies the eligibility criteria laid down for the programme concerned. Such a candidate must show satisfactory performance in the interview, must be sponsored by his/her employer and must have been in employment with the sponsoring organization for at least two years at the time of admission.

The employer must expressly undertake to pay full salary to the candidate and relieve him/her from the duty to enable the candidate to stay on the campus and to complete the course work requirements.

The candidate should submit a certificate (See Form IV of the Application Form) obtained from his/her organization that the research facilities of his/her organization would be made available to him/her for carrying out research. He/she should also provide the bio-data of the prospective

supervisor along with his/her consent, who would be supervising the candidate's work at his/her organization.

[N.B. Letter of appointment and Form – 16 for two years of service is required from the employer at the time of interview.]

An R&D organization/industry or a research area in the specific organization may be recognised by the Institute as per the following procedure. On the recommendation of the DPGC, the SPGC will constitute a committee to assess and approve an R & D organization/ industry for admission of sponsored candidates to carry out Ph.D. research in a specified area. The committee may, upon inspection, also approve all the areas in which R & D activities are going on in that organization.

An application for admission from a candidate working in the approved organization will be considered only if he/she wishes to work in the approved area.

Admission of Sponsored Candidates

A candidate who is sponsored by a teaching institution or by an R&D organization or by an industry can also apply for admission to Ph.D. programmes, provided he/she satisfies the eligibility criteria laid down for the programme concerned. He/she must have been in service of the sponsoring institution/organization for at least two years at the time of admission. The sponsoring organization must specifically undertake to provide full salary to the candidate and to relieve him/her to pursue the programme for its full duration (See Form I of the Application Form). Such candidates have to complete the requirements of the programme by staying on-campus for the full duration of the programme.

[N.B. Letter of appointment and Form – 16 issued by your employer for two years of service is required from the employer at the time of written test / interview. In addition, the candidate must submit an undertaking that he/she will continue to submit Form – 16 for the subsequent years till he/she completes the programme.]

Admission of Part-time Candidates

The Institute also offers part-time Ph.D. programmes for permanent staff and faculty members of the Institute as well as research assistants/JRFs/SRFs working in an externally funded research project running in the Institute, provided they satisfy the eligibility criteria laid down for the programme concerned. Such a candidate should submit a no-objection certificate from the Head of the Department/Coordinator of School/Principal Investigator as the case may be (See Form II & III of the Application Form) as applicable.

They will be required to attend to normal duties assigned to them by the Department/School/ the Principal Investigator of the research project and attend classes to complete the course work requirements. They are also required to continue the work of Research Project till the duration for which they were appointed in the project, failing which their admission in Ph.D. Programme will stand cancelled.

FINANCIAL ASSISTANCE

Financial assistance in the form of Institute Assistantships is available to the students admitted to M.Tech., M.Pharm. and Ph.D. programmes as full time regular students, such students must have qualified GATE/GPAT.

Presently the Assistantships @ Rs. 25,000/- per month and Rs. 12400/- per month are available to full time students admitted to the Ph.D. and M.Tech./M.Pharm. programmes respectively.

A student shall be assigned duties up to eight hours per week by the Departments/Schools to avail the Teaching Assistantship. The renewal of assistantship is contingent on the student's satisfactory performance in the academic programme and in the discharge of assistantship duties on a semester to semester basis.

For the Odd Semester of Session 2018-19, the Teaching Assistantships (Institute Assistantship) of the Institute are available for the Ph.D. programmes in each department/school as given in Table 2C of Annexure-II. The number of available Institute Assistantship should not be considered as available seats. Applicants who are either of sponsored category or who are already awarded fellowship by external agencies can submit their applications for admission in departments/schools even if there are no Institute Assistantship available.

No student shall be admitted without any form of financial assistantship. No student can get financial assistance from more than one source at a time.

Some financial assistantships in the form of research assistantships may also be available from sponsored research projects. Additional assistantships in the form of scholarships, fellowships, etc. may be available through other organizations, such as, the Council of Scientific and Industrial Research (CSIR), Department of Atomic Energy (DAE), Department of Bio-technology (DBT), Indian Council of Medical Research (ICMR), or DST-INSPIRE fellowship, etc.

SELECTION CRITERIA

M.Tech./M.Pharm Programme

Candidates shortlisted on the basis of GATE/GPAT Score, which is valid and above the qualifying pass mark may be selected for M.Tech./M.Pharm. programmes either on the basis of their GATE/GPAT score or written test or interview or on the basis of any combination of these as declared by the individual department/school.

Admission to Ph.D. Programme

1. Admission to Ph.D. programmes will be based on written test and interview of the candidates shortlisted by the Department/School concerned.
2. The following category of applicants shall be exempted from appearing in the written test:
   - **A) External Registration Category:** A candidate working in an external R&D organization or in an industry recognized by the Institute.
   - **B) Sponsored Category:** A candidate who is sponsored by a teaching institution and must have been in service of the sponsoring institution for at least two years at the time of admission.
   - **C) Part-time Category:** Permanent staff and faculty members of the Institute as well as Research Assistants/JRFs/SRFs working in an externally funded research project running in the Institute provided such projects must not have less than one year tenure left on the date of registration in the Programme.

D) National Level Scholarships: Candidates having National Level Scholarships, i.e. JRF/SRF of UGC, CSIR, DBT, ICMR, DST-INSPIRE, etc.

E) Outstanding candidates from Premier Institution:

(i) Applicants who have qualifying degree from IITs with CPI of 8.00 or above (on a 10.0 point scale).

(ii) THERE WILL NOT BE ANY CATEGORY-WISE OR SPECIALIZATION-WISE SEATS for selection under the above type;

(iii) The number of seats in this type will be 20% of the "announced number of seats" and shall be considered as "Supernumerary seats". Any fractional number arrived at would be rounded to higher integer;

(iv) Interview should be conducted for this type of candidates PRIOR to the conduct of Written Test for remaining candidates;

(v) Any candidate who could not qualify in the said Interview, through this channel, is eligible to take regular selection procedure of Written Test and Interview.

3. Further, if qualifying marks are specified in written test and/or interview a 5% relaxation will be given to SC/ST candidate. If a candidate avails such relaxation, he/she shall not be considered for admission in general category.
4. Upon approval of Chairman, Senate, the Head of the Department/Coordinator of the School concerned will issue admission letters to the candidates who will be required to accept the offer of admission by depositing the prescribed fee before a specified date.
5. In case a candidate does not accept the offer by paying the prescribed fee by the specified date, the offer of admission will stand withdrawn, and the admission will be offered to the candidates in the waiting list, if any, in order of merit.

RESERVATIONS TO SC/ST/OBC CANDIDATES:

In each discipline, 15% seats are reserved for SC, 7.5% seats for ST and 27% seats for OBC (non creamy layer) candidates. SC/ST/OBC candidates must also satisfy the eligibility requirements for admission. However, while considering their cases, only suitability for the programme is ensured and the SC/ST/OBC candidates are not compared with those belonging to other categories.

Further, a relaxation of 5% marks or 0.5 CPI (on a 10 point scale) shall be admissible on the marks obtained in qualifying degree for SC and ST candidates in the admission.

The SC/ST/OBC certificates must be produced at the time of written test / interview on the prescribed form. In case of OBC (non-creamy layer) the certificate should not be dated later than six months **from 1st May, 2018**. The following authorities are empowered to issue the SC/ST/OBC certificate:

(a) District Magistrate/ Additional District Magistrate/ Collector/ Deputy Commissioner/ Addl. Deputy Commissioner/ Deputy Collector/ First Class Stipendiary Magistrate/ City Magistrate/ Sub-Divisional Magistrate/ Taluka Magistrate/ Executive Magistrate/ Extra Assistant Commissioner.

(b) Chief Presidency Magistrate/ Additional Chief Presidency Magistrate/ Presidency Magistrate.

(c) Revenue Officer not below the rank of Tehsildar.

(d) Sub-Divisional Officer of the area where the candidate and/or his family normally resides.
(e) Administrator/ Secretary to the Administrator/ Development Officer (Lakshadweep Islands).

RESERVATIONS TO PHYSICALLY CHALLENGED (PC) CANDIDATES

In total, 3% reservation (horizontal) shall apply for candidates with physical disability as per Govt. of India norms (minimum 40% disability; attested copy of the certificate from District CMO must be furnished). Such candidates must satisfy the eligibility requirements for admission. However, while considering these applications, only suitability for the programme is ensured and they are not compared with those belonging to other categories. The candidates called for counseling may also be examined by a Medical Board constituted by the Indian Institute of Technology (BHU).

ADMISSION OF FOREIGN NATIONALS

Admissions to Ph.D. Programmes are available for Indian nationals residing abroad (INRA) and foreign nationals as per details given below.

1. Indian Nationals Residing Abroad (INRA): Candidates must have been residing abroad continuously for at least one year at the time of applying for admission. Their applications may be processed by the departments/schools as and when they are received or according to any schedule convenient to the departments/schools. The applications should be scrutinized to make sure that, in terms of qualifications, they are comparable with the candidates admitted in the general category.
2. The applications of foreign nationals, who are sponsored by the Indian Council of Cultural Relations (ICCR), will be scrutinized by the departments/schools concerned to assess their suitability for admission to the programme. The recommendations of the Department/School will be sent to the Chairman, Senate through the Chairperson, SPGC for approval.
3. Candidates belonging to the above two categories should satisfy the eligibility conditions and should have qualified GRE**.**

Note:1. Mere fulfillment of eligibility criteria does not guarantee admission in a programme. The candidates' performance in the written test and interview should be at the levels expected for the respective programmes.
2. Further details on Ph.D. programme is available on the official website www.iitbhu.ac.in.

Annexure-I

Table 1A: Requisite Qualifications for M.Tech./M.Pharm. Programmes

Most of the Bachelor's and Master's degrees that are being awarded in the disciplines/areas in the country and abroad are listed in the following. However, a candidate possessing a degree that does not exactly conform to the degrees listed below may be considered for admission, based on the performance in written test / interview and provided that the interview /admission committee, upon scrutiny of the list of courses done and credits earned by the candidate, finds that the degree concerned is at par with those listed below.

A. Programmes without specializations

Department/ School offering the Programme	Discipline	Eligibility
Department of Ceramic Engineering	Ceramic Engineering	B.Tech. or an equivalent degree in Ceramic/ Civil/ Electronics/ Electrical/ Mechanical/ Metallurgical Engg./ Chemical Engg. and Technology/Materials Science & Technology/ Silicate Technology or M.Sc. Physics (with special papers in Solid State/ Electronics) or Electronics or Chemistry (with special papers in Physical/ Inorganic/ Solid State Chemistry) provided the candidate has passed B.Sc./ B.Sc.(Hons.) Examination with Physics, Chemistry and Mathematics
Department of Chemical Engineering & Technology	Chemical Engineering	B.Tech. or an equivalent degree in Chemical Engg. or Biochemical Engineering/ Electrochemical Engineering/ Energy Engineering/ Environmental Engineering/ Food Processing Engineering/ Petrochemical Engineering/ Petroleum Engineering/ Chemical Technology/ Oil Technology/ Paint Technology/ Petroleum Technology/ Plastic Technology/ Polymer Technology/ Bio-Technology/ Food Technology with a valid GATE score in Chemical Engineering

B. Programmes with specializations

Department/ School offering the Programme	Discipline	Specialization	Eligibility

Department of Civil Engineering	Civil Engineering	a) Hydraulics and Water Resources Engineering
		b) Geotechnical Engineering
		c) Structural Engineering
		d) Environmental Engineering
		e) Transportation Engineering
		f) Geoinformatics Engineering
		g) Engineering Geosciences
			B.Tech. or an equivalent degree in the respective branch of Engineering.
			For (f) B.E. or B.Tech. Degree in (i) Civil Engineering (ii) Computer Science and Engineering (iii) Computer Engineering.
			For (g) B.Tech. or B.Tech. Degree in (i) Civil Engineering (ii) Mining Engineering (iii) Petroleum Engineering.
			M.Sc. in Geology
			Qualified in GATE in respective disciplines.

Department of Mechanical Engineering	Mechanical Engineering	a) Machine Design b) Thermal & Fluid Engineering c) Production Engineering	B.Tech. or an equivalent degree in the respective branch of engineering.
Department of Metallurgical Engineering	Metallurgical Engineering	a) Extractive Metallurgy b) Alloy Technology	B.Tech. or an equivalent degree in Metallurgical Engg., Materials Science/Engineering, Mineral/Chemical/Ceramic /Mechanical Engg., Chemical Tech. or M.Sc. (Physics/ Chemistry) with specialization in Solid State Physics, Physical/ Inorganic Chemistry provided the candidate passed B.Sc./ B.Sc. (Hons.) Examination with Mathematics as one of the subject at undergraduate level
Department of Mining Engineering	Mining Engineering	a) Mine Environment b) Rock Mechanics c) Mine Planning	B.Tech. or an equivalent degree in the respective branch of engineering.
Department of Electrical Engineering	Electrical Engineering	a) Power Systems b) Electrical Machines and Drives	B.Tech. or an equivalent degree in Electrical Engg.
		c) Control Systems	B.Tech. or an equivalent degree in Electrical/ Electronics/ Control Systems/ Instrumentation Engg.
		d) Power Electronics	B.Tech. or an equivalent degree in Electrical/ Electronics Engg.
Department of Electronics Engineering	Electronics Engineering	a) Microwave Engg. b) Digital Techniques and Instrumentation c) Microelectronics d) Communication System Engg.	B.Tech. or an equivalent degree in Electrical or Electronics Engg. with valid GATE Score in Electronics and Communication Engineering
Department of Pharmaceutical Engineering and Technology	Pharmacy	a) Pharmaceutics b) Pharmaceutical Chemistry c) Pharmacology d) Pharmacognosy	B.Pharm. or an equivalent degree in Pharmacy.

C. Inter-disciplinary programmes

Department/ School offering the Programme	Discipline	Eligibility
Department of Mechanical Engineering	Industrial Management	B.Tech. or an equivalent degree in any branch of engineering

Department of Electrical Engineering	Systems Engineering	B.Tech. or an equivalent degree in any branch of engineering
School of Materials Science and Technology	Materials Science and Technology	B.Tech. or an equivalent degree in Ceramic/ Chemical/ Civil/ Electrical/ Electronics/ Polymer/ Plastic Technology/ Materials Technology/ Nanotechnology/ Mechanical / Metallurgical Engineering OR M.Sc. degree in Chemical Science/ Materials Science/ Physical Science provided the candidate has passed B.Sc./ B.Sc. (Hons.) Examination with Chemistry/ Physics/ Mathematics and Computer Science/ Statistics.
School of Biochemical Engineering	Biochemical Engineering	B.Pharm./ B.Tech. or an equivalent degree in Biochemical/ Biotechnology/ Chemical/ Food Engg./ OR M.Sc. degree in Biochemistry/ Bio-Technology/ Microbiology or in Chemistry with specialization in Biochemistry or Physical Chemistry.
School of Biomedical Engineering	Biomedical Engineering	B.Tech. or an equivalent degree in Biomedical/ Ceramic/ Chemical/ Computer/ Electrical/ Electronics (Telecommunication/Instrumentation/Control)/ Mechanical/ Metallurgical Engg. / OR M.Sc. degree in Physics.

NOTE: 1. Candidates desirous of applying for admission to M.Tech. Programmes in different departments/schools as well as M.Pharm. programme are required to fill the primary and additional programme/discipline/specialization if any, in the order of their preference as per the instructions provided in the home page of admission portal.

2. Not more than 40% of the total seats in the Departments, wherever candidates from allied disciplines are declared eligible for admission, shall be open for any one allied discipline. However, preference will be given for eligible candidates from the discipline based on their performance in the written test / interview.

3. Not more than 40% of the total seats in interdisciplinary programmes in Schools will be open for any ONE branch of Engineering or Science.

Table 1B : Number of Seats Available for M.Tech. / M.Pharm. Programmes

Discipline	Number of Available Seats				
	General	SC	ST	OBC	Total*
Ceramic Engineering	10	03	01	05	19
Chemical Engineering	25	07	03	12	47
Civil Engineering	33	10	05	17	65
Electrical Engineering	25	07	03	12	47
Systems Engineering	05	01	01	02	09
Electronics Engineering	25	07	03	12	47
Mechanical Engineering	25	07	03	12	47
Industrial Management	05	01	01	02	09
Metallurgical Engineering	25	07	03	12	47
Mining Engineering	15	04	02	08	29
Biochemical Engineering	05	01	01	02	09
Biomedical Engineering	05	01	01	02	09
Materials Science & Technology	10	03	01	05	19
Pharmacy	20	06	03	11	40

*3% seats reserved for physically challenged candidates, which is not added in total number of seats, as provision for the physically challenged candidate will be made from within the respective category.

Annexure-II

Table 2A : Departments/Schools/Disciplines and Allied Disciplines for Ph.D. Programmes.

Most of the Bachelor's and Master's degrees that are being awarded in the disciplines in the country and abroad are listed in the following. However, a candidate possessing degree(s) that do not exactly conform to the degree(s) listed below may be considered for admission, based on the performance in written test / interview and provided that the interview / admission committee (DPGC), upon scrutiny of the list of courses done and credits earned by the candidate, finds that the degree concerned is at par with those listed below.

Departments/ Schools offering the Programme	Discipline	Allied Disciplines
Department of Ceramic Engineering	Ceramic Engineering	Bachelor's / Master's degree in any branch of Engineering. Master's degree in Chemistry/Applied Chemistry/Physics/ Applied Physics/Geology or Geophysics (with Mathematics as a subject at Bachelor's Degree level). Master's degree in Modern Medicine / Indian Medicine (for the areas related to Bioceramics). Preference would be given to candidates with B.Tech./M.Tech. in Ceramic Engineering/with some background of ceramics.
Department of Chemical Engineering & Technology	Chemical Engineering	Bachelor's/Master's degree in any branch of Engineering/Technology with Mathematics at Senior Secondary (Plus 2)/Intermediate level. Master's degree in Chemistry/Biochemistry/Environmental Science/ Biotechnology/Industrial Chemistry with Mathematics at Senior Secondary (Plus 2)/Intermediate level.
Department of Civil Engineering	Civil Engineering	M.Sc.(Engg.)/M.E./M.Tech. degree in Applied Mechanics, Mining Engineering, Chemical Engineering, Chemical Engineering and Technology, Chemical Technology, Mechanical Engineering, Aerospace Engineering, Naval Engineering, Industrial Engineering, Agricultural Engineering. M.Sc.(Engg.)/M.E./M.Tech. in Geoinformatics, Geomatics, Remote Sensing, Remote Sensing and GIS. M.E./M.Tech. in Computer Science and Engineering, Computer Engineering. B.Sc.(Engg.)./B.E./B.Tech./M.Sc.(Engg.)/M.E./M.Tech. or equivalent degree in Environmental Engineering, Environmental Science and

Departments/ Schools offering the Programme	Discipline	Allied Disciplines
		Engineering, Environmental Science and Technology. M.Sc./M.Tech. in Geophysics, Geology.
Department of Computer Science & Engineering	Computer Science & Engineering	B.Tech./B.E./M.Tech./M.E. degree in Computer Technology/ Information Technology/ Electronics Engineering/ Electronics and Communication Engineering/All related subjects of Computer Engineering at M.Tech. level/ M.Tech. in Mathematics & Computing.
Department of Electrical Engineering	Electrical Engineering	B.Tech. & M.Tech. in Electronics Engineering.
Department of Electrical Engineering	Systems Engineering	Bachelor's and Master's Degree in any Branch of Engineering or Bachelor's Degree in any Branch of Engineering.
Department of Electronics Engineering	Electronics Engineering	Master's degree in any of the following areas: Digital Communication Systems, Information and Coding Theory, Telecom Networks, Mobile and Wireless Communication Systems, Digital Systems and Microprocessors, Digital Signal and Image Processing, Computer Vision and Robotics, Signal and Systems Theory, Control Systems, Fuzzy Logic, Neural Networks and their applications, Power Electronics, Microelectronics and VLSI Systems, Semiconductor Device Modelling and Simulation, Solid State Devices, Organic Electronics, Transparent Semiconductors and Photovoltaics, Sensors and Pattern Recognition, Electronic Instrumentation and Virtual Instrumentation, Electromagnetics, RF Engineering and Microwaves, Antennas, Optoelectronics and Optical Communication, Photonic Networks and Systems, Information Technology.
Department of Humanistic Studies	Humanities and Social Sciences	Master's/Bachelor's degree in any Engineering discipline; Master's degree in any Science discipline; 4-year – Bachelor's Science degree.
Department of Mechanical Engineering	Mechanical Engineering	Bachelor's degree in Production Engineering and Master's degree in any discipline/ area relevant to Mechanical Engineering.
Department of Mechanical Engineering	Industrial Management	Bachelor's degree in any branch of Engineering and Master's degree in any branch of Engineering/Management.

Departments/ Schools offering the Programme	Discipline	Allied Disciplines
Department of Metallurgical Engineering	Metallurgical Engineering	Bachelor's / Master's degree in Mechanical / Chemical / Production Engg./Manufacturing Engg./Mineral Engg./ Ceramic Engg. Master's degree in Materials Science / Engg./ Technology Master's degree in Physical Sciences (Solid State Physics)/Chemical Sciences (Inorganic / Physical Chemistry/Industrial Chemistry)/ Biological Sciences/Geology with Mathematics as a subject at Bachelor's level.
Department of Mining Engineering	Mining Engineering	Master's degree in Geology/Geophysics/Geohydrology Mathematics/ Petroleum Geosciences /Chemistry/ Environmental Science/Materials Science/Botany/ Zoology/Polymer Science/Computer Science Master's degree in Chemical Engg. / Environmental Engg. /Civil Engg./Industrial Engg./Mechanical Engg./Electrical Engg./Computer Engg./Electronics Engg./Polymer Engg. or Technology/ Ceramic Engg./Materials Engg./Information Technology
Department of Pharmaceutical Engineering and Technology	Pharmacy	MS/M.Tech. in Pharmacy/Pharmaceutical Sciences/ Pharmaceutical Engineering/Pharmaceutical Technology/ Pharmaceutical Biotechnology/ Bioinformatics/ biochemical Engineering/ Biomedical Engineering with graduation in Pharmacy (B.Pharm.).
Department of Physics	Physics	M.Sc./M.Tech. in Applied Physics, Engineering Physics, Bio-Physics, Electronics Engg., Materials Science, Ceramic Engg., Metallurgical Engg., Electrical Engg., Bio-Informatics, Geomatics and Geoinformatics, Computer Science, Computer Engg., Mechanical Engg., Mathematics, Chemistry, Remote Sensing, Astrophysics, Space Physics, Applied Optics, Atmospheric Physics, Fibre Optics & Photonics.
Department of Chemistry	Chemistry	M.Sc./M.Tech. in Chemistry/ Industrial Chemistry/ Applied Chemistry/ Biochemistry/ Biotechnology/Medicinal Chemistry/ Materials Science & Technology/Environmental Science and Nano Technology with chemistry as a subject at Bachelor Level.
Department of Mathematical Sciences	Mathematical Sciences	Master's degree in Statistics/ Computer Science/ Computer Engineering, with Mathematics as a subject at Bachelor's level. Bachelor's degree (B.Tech./B.E.) in Mathematics and Computing/ Computer Engineering/Computer Science.

Departments/ Schools offering the Programme	Discipline	Allied Disciplines
School of Biochemical Engineering	Biochemical Engineering	Master's degree in Biochemistry / Biotechnology/Microbiology/ Environmental Science. Bachelor's/Master's Degree in Biochemical Engg./ Food Technology/Pharmacy/Chemical Engineering/Biotechnology
School of Biomedical Engineering	Biomedical Engineering	B.Tech./M.Tech. degree in Bioengineering/Electrical Engg./ Electronics Engg./Instrumentation Engg./Mechanical Engg./ Computer Engg./Materials Science & Technology/ Chemical Engg./ Bio-technology/ Nanotechnology. M.Sc./M.Tech./Engineering in Pharmacy. M.Sc./M.Tech. in Statistics, Mathematics. M.Sc. degree in Physics/Chemistry/Polymer Sciences/ Biochemistry/ Life Sciences.
School of Materials Science & Technology	Materials Science & Technology	Master's degree in Chemical Sciences, Materials Science and Physical Sciences. Bachelor's / Master's degree in Ceramic/ Chemical/ Civil/ Electrical/ Electronics/ Mechanical / Metallurgical/ Polymer Engineering/ Plastic Technology/ Materials Technology/ Nanotechnology. Master's degree in Dentistry/ Orthopedics/ E.N.T./ Rasa Shastra.

Table 2B : Discipline-wise Research Areas for Ph.D. Programmes.

The discipline-wise the Research Areas in the Ph.D. programmes for the session 2018-19 are listed below.

Disciplines	Research Areas
Ceramic Engineering	Bio-Ceramics, Ceramic/Metal/Polymer matrix composites, Electro Ceramics, Glass and Glass Ceramics, Refractories, Advanced Ceramics, Nano Technology, Cement & Concrete Technology, Energy Materials.
Chemical Engineering	To be announced at the time of Interview
Civil Engineering	Structural Engineering; Hydraulics and Water Resources Engineering; Environmental Engineering; Geotechnical Engineering; Transportation Engineering; Geo-informatics; Gelogy.
Computer Science & Engineering	Social Network Analysis, HPC, Machine Vision, Natural Language Processing, Information Extraction, Data Mining, Image Processing, Pattern Recognition.
Electrical Engineering	Electrical machines & Drives; Power Electronics; Control Systems; Power Systems
Systems Engineering	Systems Engineering
Electronics Engineering	Microwave Engineering; Digital Techniques and Instrumentation; Microelectronics, Communication System Engineering
Humanities and Social Sciences	a) English b) Philosophy (Indian and Western Logic, Peace and Ahimsa Studies, Gandhian Philosophy, Value Education, Humanistic Philosophy) c) Computational Linguistics (MT, CALL, Computational Semantics, Grammar Formalism, Sanskrit Computation Linguistics) d) Psychology (Intelligence, Indigenous Research, Macro Organizational Behaviour) e) Sociology (Environmental Sociology, Sustainable Urbanization, Smart Cities)
Mechanical Engineering	a) **Machine Design:** Fracture behavior of fibre composite through thickness, Mechanical behavior of biocomposites; Composites, Impact and failure mechanisms, Computational Fracture Mechanics, Transient Dynamics; Nuclear graphite and Fracture Characterization; Biomechanics, Cardiovascular stent design; Tiobology; Fracture Mechanics; Composite Materials such metal matrix composite, hybrid composite and nano composite for the mechanical and tribological applications; Fatigue wear modeling, contact modeling and its relevance to wear, Reliability of MEMS Devices. b) **Production Engg.**: Additive manufacturing, unconventional manufacturing, Incremental Forming & Manufacturing, Metal firming,

Disciplines	Research Areas
	Manufacturing automation using: CAD/CAM/CAE/CE/Reverse Engg.; Tool wear condition monitoring; Materials aspect of Triobology, Composite Materials and Laser Surface Texturing; Weld metal characteristics, Thermal effects on weld metal properties, stress removal in casting. c) **Thermal and Fluid:** Thermal behavior of Fibre Composite Materials; Solar Thermal, Alternate Fuel, Hybrid System; Engine Simulation; Multi-phase flows related to Molten Metal-Gas interaction, Hydro and Gas cyclones, Droplet/Bubble dynamics; Atomization – Pressure assisted, Electrohydrodynamic; Aerosol generation and measurement; Particle Image Velocimetry; Heat and Mass Transfer Analysis of Grains during fludized bed drying for achieving energy economy and higher quality; Influence of Climate Change for the Specification of Design Wind Speed of Engineering Structure, Gasification based Polygeneration Cycle of Biomass for Hydrogen Production; Numerical and Experimental analysis of pulverized coal and biomass combustion.
Industrial Management	Operations Management, SCM, Production System
Metallurgical Engineering	Microstructural, Structural and Chemical Characterization; Mechanical Behavior, Deformation Processing and Failure Analysis; Phase Equilibria and Phase Transformation; Non-Equilibrium Processing of Advanced Materials; Ultra-Fine Grained and Nano-Structured Material; Metallurgical and E-Waste Utilization; Design and Development of Advanced Steels; Tribology and Surface Engineering' Thermodynamics and Kinetics of Metallurgical Processes' Advanced Structural and Functional Materials.
Mining Engineering	To be announced at the time of Interview
Pharmacy	Pharmaceutics, Pharmaceutical Chemistry, Pharmacognosy.
Physics	Solar & Space Plasma Physics, Condensed Matter Physics (Theory), Quantum Information, Condensed Matter Physics (Experiment) & Materials Science (Experiment), Biophysics, Photonics (Theory and Experiment), Remote Sensing.
Chemistry	Synthetic Chemistry, Environmental Chemistry, Surface Chemistry, Computational Chemistry.
Mathematical Sciences	Harmonic Analysis, Differential Geometry, Numerical Wavelet methods for partial differential equations, Numerical Analysis of PDEs, Mathematical Image Processing, Stochastic Modeling (Queuing Theory), Integral Equations, Numerical Analysis, Optimization, Fluid Dynamics, Biomechanics, Non-Linear Waves, Graph Theory and Network Science, Rings and Modules, Mathematical Modeling and Porous Media, Soft Computing, Fuzzy Sets, Algebraic Numerical Techniques, Mathematical Modeling on heat Transfer Problem.

Disciplines	Research Areas
Biochemical Engineering	To be announced at the time of Interview
Biomedical Engineering	Physiology; Electrophysiology & Neuro Biology; Polymer in Medicine; Bioinstrumentation, Biomedical Signal & Image Processing; Modeling of Biological System, Biological Control System Analysis; Biomechanics; Tissue Engineering & Micro fluidics; Molecular Biology, Biochemistry, Biotechnology & Nano Medicine; Optical Nanomaterial, Biosending, Image Theuranostics.
Materials Science & Technology	M.Sc./B.Tech./M.Tech. Degree in Materials Science/Physics/Chemistry/ Polymer Science/ Materials Science & Technology/ Polymer Engineering & Technology/Nanoscience and Nanotechnology/Biotechnology.

Table 2C: Total Number Institute Assistantship available in the departments/schools in Odd Semester 2018-19

Discipline	Total Number of Available Assistantship
Biochemical Engineering	08
Biomedical Engineering	04
Ceramic Engineering	05
Chemical Engineering	10
Chemistry	09
Civil Engineering	10
Computer Science & Engineering	14
Electrical Engineering	13
Electronics Engineering	08
Humanities & Social Sciences	12
Industrial Management	02
Materials Science & Technology	07
Mathematical Sciences	16
Mechanical Engineering	15
Metallurgical Engineering	20
Mining Engineering	11
Pharmacy	07
Physics	18
Systems Engineering	02

The number of available Institute Assistantship should not be considered as available seats. Applicants who are either of sponsored category or who are already awarded fellowship by external agencies can submit their applications for admission in departments/schools even if there are no Institute Assistantship available.

Annexure-III

LIST OF R & D ORGANIZATIONS RECOGNIZED BY THE INSTITUTE FOR EXTERNAL REGISTRATION

1. All R & D Laboratories/Institutions of CSIR, DAE, DOS, DRDO, DST and Ministry of Telecommunication & Information Technology.
2. Bharat Heavy Electricals Limited (BHEL), Research and Development Laboratories.
3. Central Indian Pharmacopoeia Laboratory, Ghaziabad.
4. Central Mine Planning and Design Institute Limited, Ranchi.
5. Central Power Research Institute, Bangalore.
6. Central Pulp and Paper Research Institute, Saharanpur.
7. Diesel Locomotive Works (DLW), Varanasi
8. Hindustan Aeronautics Limited, Lucknow & Korwa.
9. Hindustan Machine Tools (R & D Division), Bangalore.
10. Indian Bureau of Mines, Nagpur.
11. Jyoti Limited, Baroda.
12. Kirloskar Electric Limited, Bangalore.
13. Mechanical Engineering Research and Development Organization, Pune.
14. National Institute of Rock Mechanics, Kolar.
15. National Council for Cement and Building Materials (NCCBM), New Delhi.
16. Raman Research Institute, Bangalore.
17. Tata Steel, Jamshedpur.
18. National Metallurgical Laboratory Extension Centre, Chennai.