Q I P

QUALITY IMPROVEMENT PROGRAMME

Advance Admission to Ph.D. Programmes for the academic year 2015-2016 (Final Admission: 2016-2017)

(for teachers of AICTE approved Degree level Engineering Institutions, National Institutes of Technology and National Institutes of Technical Teachers' Training and Research)

INFORMATION BROCHURE

Sponsored by

All India Council for Technical Education
(A Statutory Body of Government of India)

Admission coordinated by

Principal Coordinator QIP

Centre for Development of Technical Education

Indian Institute of Technology Kanpur

Kanpur – 208016

DATES TO REMEMBER	
Access to on line submission of applications	29th Sept. 2014
Closing of on line applications access	03st Nov. 2014
Last date for receipt of duly forwarded application along with enclosures	10th Nov. 2014

Both online and hardcopy of the application are required for processing, single version of the application will not be considered

Dear Prospective QIP Scholar

Your interest in the 'Quality Improvement Programme (QIP)' sponsored by AICTE is appreciated. As you may be aware, the main objective of the programme is to upgrade the expertise and capabilities of the faculty members of AICTE approved degree-level engineering institutions, National Institutes of Technology (NITs) and National Institutes of Technical Teachers' Training and Research (NITTTRs) of the country. The programme launched by the Government of India in the year 1970, is now being implemented and monitored by the National QIP Coordination Committee, funded through AICTE.

There are three main activities under QIP scheme for the faculty of degree-level engineering institutions:

- Providing opportunities to teachers of the degree-level engineering institutions to improve their qualifications by offering admissions to M. Tech and Ph. D. degree programmes.
- Organizing Short Term Courses at the QIP Centers for updating / upgrading the knowledge of faculty members.
- Curriculum Development Cell activities which help to improve the class room teaching and learning.

Eight major QIP centres at IITs and IISc undertake the various activities listed above. Admission to M.Tech and Ph.D. programmes are also offered in selected areas in additional institutions recognized as minor QIP centers. A large number of teachers from engineering institutions from all over the country have pursued Master and PhD degree programmes under this scheme. These are aimed at improving the standard and quality of technical education through improvement of the qualifications of the faculty members of various engineering institutions.

A Curriculum Development Cell has been set up at major QIP Centres for improving the effectiveness of technical education in the country. Its activities include curriculum development and revision or preparation of monographs, textbooks, teacher's manuals, teaching aids and other resource materials, examination reforms, organizing inter-institutional programs, seminars, workshops and panel discussions, development of educational technology, creation of methodologies for formal and informal trainings, technical education of the handicaps, etc. A number of short term courses have also been organized by major QIP Centres for the benefit of the faculty members of Engineering Institutions across the country.

The QIP web sites **(http://www.qip.cce.iisc.ernet.in, www.iitb.ac.in, www.iitd.ac.in, www.iitg.ernet.in, www.iitk.ac.in/qip/admission, www.iitkgp.ernet.in, www.qip.iitm.ac.in, www.iitr.ernet.in, www.aicte.ernet.in)** will give you necessary information about the programme as well as about the requirements and the procedure to apply for admission in Master / Ph.D. degree programmes. The details of the disciplines and specializations available at various centres are listed in the website and also available in the admission brochure to enable you to make appropriate choices. You can navigate through the links on the left hand side of the main web page for admission and can download the admission brochure.

Access to the on-line submission of application opens on **September 29th, 2014 (Monday).** The last date for the on-line submission of the application is **November 03rd, 2014 (Monday).** Please note that the last date for the receipt of the hard copy of application at the office of the Principal Coordinator QIP, Centre for Development of Technical Education, Academic Affairs Building, Room No.-303, Indian Institute of Technology Kanpur, Kanpur-208016 (U.P.) is **November 10th, 2014 (Monday).**

The procedure of admission under QIP involves the following steps:

- Scrutiny of all applications in the office of the Principal Coordinator QIP.
- Short-listing by the QIP centres for interviews and dispatch of call letters to those selected for interviews.
- Recommendations by the QIP centres to NQCC.
- Final selection by the National QIP Coordination Committee (NQCC) and
- Offer of Admission by the Institution where the final selection has been recommended by NQCC.

The schedule of interviews at various QIP Centres is given in the brochure, so that you can plan your travel for attending the interviews at places of your choice. For further information about the QIP, the application form or any associated item, you may contact to the Principal coordinator QIP or any of the Coordinators of the QIP Centres listed in the website or brochure.

For further information about a particular institution or a particular department therein, you may directly write to the Head of concerned department or the QIP Coordinator of the institution.

Keep in touch with our website.

Wishing you all the best,

Principal Coordinator QIP, Centre for Development of Technical Education, IIT Kanpur.

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I. GENERAL INFORMATION

1. The major QIP Centres at IITs and IISc offer admission to Ph.D. degree programmes in several disciplines. In addition, institutions recognised as the minor QIP Centres also offer admission to Ph.D. degree programmes under QIP in some specific departments.

2. Prior to regular admission to the Ph.D. programme at a QIP Centre, a candidate is required to join a pre- Ph.D. contact programme. The duration of the pre-Ph.D. program is 60 days (Advance Admission Scheme) and that of the regular Ph.D. Degree Program is 3 years.

3. Candidate should visit the website **http://www.iitk.ac.in/qip/admission** for submitting on-line application, updated information related to: receipt of completed application, candidates called for interview, selected list of candidates and all other information pertaining to QIP admission.

4. Candidate should read the **brochure** thoroughly before i) filling the fields **in the on-line application** and ii) sending the final print-out of application (duly forwarded by the Head of Institution).

5. Candidates have to first submit their application form on-line through **http://www.iitk.ac.in/qip/admission** applications without on-line submission will not be considered. Candidate should make sure that proper Institute / Discipline codes are entered, all relevant details are duly filled in the respective fields. Access to the on-line submission of application opens on **September 29th, 2014 (Monday)**. Last date for the on-line submission of application is **November 03rd, 2014 (Monday)**.

6. After filling the application on-line, candidates should send the **relevant number** of prints of the **on-line** completed form, duly forwarded by the Principal/Head of the Institution, as instructed along with all enclosures and a DD for Rs.1000/- (Rs.500/- for SC/ST/PD/Females Candidate) drawn in favour of **'Coordinator, Continuing Education Programme, IIT Kanpur'**, payable at "**Kanpur"**, to **The Principal Coordinator QIP, Centre for Development of Technical Education, Academic Affairs Building, Room No.-303, Indian Institute of Technology Kanpur, Kanpur – 208016 (U.P.).**

7. The candidate and the Principal/Head of the Institution forwarding the application should ensure that the application is to be send to the Principal Coordinator QIP/CDTE, Room No. 303, Academic affairs Building, IIT Kanpur so as to reach **on or before November 10, 2014 (Monday)**. **Applications received after this date will not be considered**. On receipt of the application, acknowledgement will be sent by email.

8. Information given by the candidate in all application print-outs should be same. In case of any difference observed in the data relating to experience, marks, designation, addresses, age etc., his/her candidature is liable to be cancelled at any stage even after the selection/ admission.

9. **Conditional recommendation** by the Principal/Head of the Institution will not be accepted. **Applications submitted without signatures of the candidate and the appropriate authorities with seal, and/or without the required enclosures will automatically be rejected.**

10. The application number allotted during the on-line registration should be quoted in all correspondences, and **such correspondences should be routed through the Principal/Head of the candidate's parent institution.** The application number may be changed in some unavoidable circumstances and will be intimated through email in such cases.

11. Short-listed candidates will receive Interview Call/Admission letter from the respective QIP Coordinator of the Institute, where they have applied to seek admission. The Principal Coordinator QIP will not send any Call letter to the candidate directly.

12. **Interview schedule** is final and cannot be altered/ changed under any circumstances. Candidate has to appear for interview at the Institute(s), where he/she would like to seek admission. Candidates may plan their travel accordingly.

13. Concessions, relaxation, and reservations for candidates belonging to SC/ST/OBC/Physically Disabled/Female candidates are as per rules. The reservation rules of GOI will be applied to overall admissions by the NQCC. The selection of a candidate is considered only after the recommendation of the major / minor QIP center.

II. INSTITUTIONS OFFERING MASTER DEGREE PROGRAMMES UNDER QIP AND THEIR CODES

Sl. No.	Name of the Institute/University	Code
Institutions that are Major QIP Centres: The following institutions having QIP Centres which offer admission to Ph.D degree programmes in several disciplines existing in those institutions:		
1	Indian Institute of Science, Bangalore – 560 012	**BG**
2	Indian Institute of Technology Bombay, Mumbai – 400 076	**BM**
3	Indian Institute of Technology Delhi, New Delhi – 110 016	**DL**
4	Indian Institute of Technology Guwahati, Guwahati – 781 039	**GW**
5	Indian Institute of Technology Kanpur, Kanpur – 208 016	**KN**
6	Indian Institute of Technology Kharagpur, Kharagpur – 721 302	**KH**
7	Indian Institute of Technology Madras, Chennai – 600 036	**MD**
8	Indian Institute of Technology Roorkee, Roorkee – 247 667	**RR**
Other Institutions that are Minor QIP Centres: The following recognized institutions also offer admission to Ph.D Degree Programmes under QIP in some specific departments as given below:		
9.	Anna University, College of Engineering Campus, Chennai – 600 025 (i) Civil Engineering, (ii) Electrical Engineering, (iii) Information and Communication Engineering, (iv) Mechanical Engineering Anna University, AC Technology Campus, Chennai – 600 025 (i) Chemical Engineering. (ii) Leather Technology Anna University, Madras Institute of Technology, Chennai – 600 044 (i) Aerospace Engineering, (ii) Automobile Engineering, (iii)Electronics Engineering, (iv) Instrumentation Engineering (v) Production Technology	**AU**
10.	Basaveshwar Engineering College, (Autonomous), S Nijalingappa, Bagalkot – 587 102 (i) Civil Engineering, (ii) Mechanical Engineering, (iii) Electrical Engineering, (iv) Electronics & Communication Engineering (v) Computer Science & Engineering	**BB**
11.	Indian Institute of Engineering Science and Technology, Shibpur – 711 103 (i) Civil Engineering, (ii) Electrical Engineering, (iii)Mechanical Engineering, (IV) Mining Engineering, (V) Aerospace Engineering and Applied Mechanics, (VI) Information Technology, (VII) Metallurgy & Materials Engineering.	**BE**
12.	B.M.S. College of Engineering, Bangalore – 560 019 (i) Civil Engineering, (ii) Electrical Engineering, (iii)Mechanical Engineering, (iv) Industrial Engineering & Management, (v) Electronics & Communication Engineering.	**BS**
13.	Coimbatore Institute of Technology, Coimbatore – 641 014 (i) Civil Engineering, (ii) Mechanical Engineering, (iii) Electrical & Electronics Engineering, (iv) Chemical Engineering.	**CC**
14.	College of Engineering, Pune(Maharashtra) – 411 005 (i) Civil Engineering, (ii) Mechanical Engineering, (iii) Production Engineering, (iv) Electrical Engineering, (v) Electronics & Telecommunication, (v) Computer Engineering Information Technology (vii) Instrumentation & Control (viii) Metallurgy &Materials Science Instrumentation & Control, (viii) Metallurgy & Materials Science	**CP**
15.	College of Engineering Trivandrum Thiruvananthapuram – 695 016 (i) Civil Engineering, (ii) Mechanical Engineering, (iii) Electrical Engineering, (iv) Electronics & Communication Engineering.	**CT**
16.	Delhi Technological University, Delhi (i) Civil Engineering, (ii) Mechanical Engineering, (iii) Electrical Engineering, (iv) Polymer Science & Chemical Technology	**DD**
17.	Govt. College of Engineering, Aurangabad 431 005 (Maharashtra) (i) Civil Engineering, (ii) Electrical Engineering, (iii) Electronics & Communication Engineering.	**GA**
18.	Govt. Engineering College Govt. of Kerala, Thrissur – 680 009 (i) Civil Engineering, (ii) Mechanical Engineering, (iii) Electrical Engineering.	**GK**

Sl. No.	Name of the Institute/University	Code
19.	Govt. Engineering College, Salem – 680 009 (TN) (i) Civil Engineering, (ii) Mechanical Engineering, (iii) Electrical Engineering.	**GC**
20.	Guru Nanak Dev Engineering College, Ludhiana – 141 006 (Punjab) (i) Civil Engineering, (ii) Mechanical Engineering, (iii) Electrical Engineering.	**GN**
21.	Indian School of Mines, Dhanbad – 826 004 (i) Mining Engineering	**IS**
22.	Indian Institute of Technology, BHU, Varanasi – 221 005 (i) Metallurgical Engineering, (ii) Mining Engineering	**VN**
23.	Jadavpur University, Kolkata – 700 032 (i) Electrical Engineering, (ii) Electronics & Telecommunication Engineering, (iii) Mechanical Engineering (iv) Production Engineering	**JU**
24.	Madan Mohan Malaviya University of Technology Gorakhpur (UP) – 273 010 (i) Civil Engineering, (ii) Electrical Engineering, (iii) Electronics & Communication Engg., (iv) Mechanical Engineering	**MM**
25.	Madhav Institute of Technology & Science, Gwalior – 470 005 (i) Civil Engineering, (ii) Electrical Engineering, (iii) Computer Science & Engineering, (iv) Mechanical Engineering (v) Architecture	**MG**
26.	Manipal Institute of Technology, Manipal – 576 104 (i) Civil Engineering, (ii) Mechanical and Manufacturing Engineering	**MI**
27.	Motilal Nehru National Institute of Technology, Allahabad–211 004 (i) Electrical Engineering (ii) Electronics Engineering (iii) Mechanical Engineering	**MN**
28.	National Institute of Technology, Calicut - 673 601 (i) Civil Engineering, (ii) Electrical Engineering, (iii) Electronics & Communication Engineering, (iv) Mechanical Engineering	**CL**
29.	National Institute of Technology Karnataka, Surathkal – 575 025 (i) Applied Mechanics & Hydraulics, (ii) Chemical Engineering, (iii) Civil Engineering, (iv) Computer Science & Engineering, (v) Electrical & Electronics Engineering, (v) Electronics & Communication Engineering,, (vii) Humanities Social Science & Management (viii) Mathematical & Computational Science (ix) Mechanical Engineering (x) Metallurgical & Materials Engineering	**SK**
30.	National Institute of Technology, Rourkela – 769 008 (i) Ceramic Engineering, (ii) Chemical Engineering, (iii) Electronics & Communication Engineering, (iv) Electrical Engineering, (v) Mechanical Engineering, (vi) Metallurgical & Materials Engineering, (vii) Mining Engineering	**RK**
31.	National Institute of Technology, Tiruchirappalli – 620 025 (i) Electrical & Electronics Engineering, (ii) Metallurgical & Materials Engineering, (i) (iii) Production Engineering, Chemical Engineering (ii) Civil Engineering (iii) Computer Science & Engineering (iv) Instrumentation & Control (v) Mechanical Engineering	**TR**
32.	National Institute of Technology, Warangal – 506 004 (i) Chemical Engineering. (ii) Civil Engineering. (iii) Mechanical Engineering, (iv) Mathematics & Humanities	**WR**

Sl. No.	Name of the Institute/University	Code
33.	PSG College of Technology, Coimbatore – 641 004 (i) Mechanical Engineering (ii) Production Engineering	**PS**
34.	Samrat Ashok Technological Institute, Vidisha (M.P) (i) Civil Engineering, (ii) Computer Science & Engineering, (iii) Information Technology, (iv) Electrical Engineering, (v) Mechanical Engineering,	**SV**
35.	Shri G. S. Institute of Technology & Science, Indore – 452 003 (i) Civil Engineering, (ii) Electrical Engineering, (iii) Electronics & Communication Engineering, (iv)Computer Science & Engineering, (v) Mechanical Engineering, (vi) Industrial & Production Engineering.	**GS**
36.	Shri Guru Gobind Singh Institute of Engineering & Technology, Nanded – 431 606 (i) Electronics & Communication Engineering, (ii) Instrumentation & Control, (iii) Production Engineering, (iv) Civil Engineering, (v) Mechanical Engineering,	**SG**
37.	The National Institute of Engineering, Mysore – 570 008 (i) Civil Engineering, (ii) Electrical Engineering, (iii) Industrial Engineering (iv) Production, (v) Computer Science & Engineering (vi) Information Technology	**NM**
38.	Thiagarajar College of Engineering, Madurai – 625 015 (i) Civil Engineering, (ii) Electrical Engineering, (iii) Mechanical Engineering, (iv) Electronics & Communication Engineering., (v) Computer Science & Engineering.	**TM**
39.	University Visveswaraya College of Engineering, Bangaluru – 560 056 (i) Civil Engineering	**UV**
40.	Veer Surendra Sai University of Technology, Burla (Orissa) (ii) Civil Engineering, (ii) Electrical Engineering, (iii) Electronics & Communication Engineering, (iv) Mechanical Engineering. (v) Production Engineering.	**VB**
41.	Visvesvaraya National Institute of Technology, Nagpur – 440 011 (i) Electrical Engineering (ii) Metallurgical Engineering	**VR**
42.	Walchand College of Engineering, Sangli - 416 415 (i) Civil Engineering (ii) Mechanical Engineering (iii) Electrical Engineering (iv) Electronics & Communication Engineering, (v) Computer Science & Engineering	**WS**
43	S.V. National Institute of Technology, Surat - 395 007 (i) Civil Engineering (ii) Mechanical Engineering (iii) Electrical Engineering (iv) Electronics & Communication Engineering (v) Computer Engineering (vI) Chemical Engineering	**SS**
44	Malaviya National Institute of Technology, Jaipur - 302 017 (i) Chemical Engineering (ii) Civil Engineering (iii) Electrical Engineering (iii) Mechanical Engineering Metallurgical & Materials (vi) Electronics & Communication Engineering (vii) Computer Engineering	**MJ**
45	National Institute of Technology, Durgapur - 713 209 (i) Biotechnology (ii) Chemical Engineering (iii) Civil Engineering iv) Computer Science & Engineering (v) Electronics & Communication Engineering (vi) Electrical Engineering (vii) Mechanical Engineering (viii) Metallurgical Materials Engineering	**ND**

Sl. No.	Name of the Institute/University	Code
46	National Institute of Technology, Silchar - 788010 (i) Civil Engineering (ii) Computer Science & Engineering (iii) Electrical Engineering (iv) Electronics & Communication Engineering	**NS**
47	National Institute of Technology, Agartala – 799055 (i) Mechanical Engineering (ii) Electronics & Communication Engineering (iii) Electrical Engineering (iv) Production Engineering (v) Civil Engineering	**NA**
48	PDPM Indian Institute of Information Technology Design & Manufacturing, Jabalpur - 482 005 (i) Computer Science & Engineering (ii) Electronics & Communication Engineering (iii) Mechanical Engineering	**PD**
49	Rajiv Gandhi Institute of Technology, Govt. Engineering College, Kottayam - 686 501 (i) Electrical Engineering (ii) Mechanical Engineering (iii) Civil Engineering	**RG**
50	Giani Zail Singh College of Engineering. & Technology, Bathinda (Punjab) - 151 001 (i) Computer Science & Engineering (ii) Mechanical Engineering (iii) Electrical Engineering (iv) Civil Engineering	**GZ**
51	Government College of Engineering, Amravati - 444 604 (i) Electrical Engineering (ii) Mechanical Engineering (iii) Civil Engineering	**AM**
52	Netaji Subhas Institute of Technology, New Delhi - 110 078 (i) Electronics communication Engineering (ii) Computer Engineering (iii) Instrumentation & Control (iv) Manufacturing Process & Automation (v) Biotechnology	**NN**
53	Kamla Nehru Institute of Technology, Sultanpur - 228 118 (i) Electrical Engineering	**KS**
54	Pondicherry Engineering College, Puducherry - 605 014 (i) Electronics & Communication Engineering (ii) Computer Science & Engineering (iii) Electrical Engineering (iv) Mechanical Engineering (v) Civil Engineering	**PY**
55	Sardar Patel College of Engineering, Mumbai - 400 058 (i) Civil Engineering	**SM**
56	Veermata Jijabai Technological Institute (VJTI), Mumbai - 148 106 (i) Civil Engineering (ii) Electrical Engineering (iii) Mechanical Engineering (iv) Electrical Engineering (v) Textile Technology	**VM**
57	Sant Longowal Institute of Engineering & Technology, (Deemed University), Punjab - 148 106 (i) Mechanical Engineering (ii) Food Engineering & Technology (iii) Electronics & Instrumentation Engineering (iv)Chemical Technology	**SP**
58	Indira Gandhi Institute of Technology, Sarang, Odisha - 759 146 (i) Civil Engineering (ii) Mechanical Engineering (iii) Electrical Engineering	**IO**
59	Harcourt Butler Technological Institute, Kanpur - 208 002 (i) Civil Engineering (ii) Mechanical Engineering (iii) Electronics & Communication Engineering (iv) Chemical Engineering	**HK**
60	TKM College of Engineering, Kollam (Kerala) - 691 005 (i) Civil Engineering (ii) Mechanical Engineering	**TK**

III. CODES FOR DEPARTMENTS OFFERING TO Ph.D. DEGREE PROGRAMMES AT VARIOUS INSTITUTIONS

Department/Centre	Code	Institution(s) Offering Ph.D. Degree Programme
Aerospace Engineering	AE	**BG, BM, KH, KN, MD**
Aeronautical Engineering	AE	**AU**
Agriculture & Food Engineering	AG	**KH**
Alternate Hydro Energy Centre	AH	**RR**
Applied Mechanics	AM	**DL, MD, MN**
Applied Mechanics & Hydraulics	AM	**SK***
Applied Research In Electronics	AL	**DL**
Architecture & Planning	AR	**RR, MG**
Architecture & Regional Planning	AP	**KH**
Atmospheric & Oceanic Sciences	AS	**BG**
Atmospheric Sciences	AS	**DL**
Automobile Engineering	AU	**AU**
Biochemical Engineering & Biotechnology	BC	**DL**
Biomedical Engineering	BM	**DL**
(School of) Biosciences & Bioengineering	BS	**BM**
Biotechnology	BT	**GW, KH, MD,ND, NN, RR**
Ceramic Engineering	CM	**RK**
Centre of Excellence in Disaster Mitigation & Management.	DM	**RR**
Centre of Nanotechnology	NT	**RR**
Centre for Studies in Resources Engineering	SR	**BM**
Centre for Sustainable Technology	ST	**BG**
Chemical Engineering	CH	**AU, BG, BM, CC, DL, GW,HK, KH, KN, MD,MJ, ND, RK, RR, SK,SS, WR,**
Chemistry	CY	**BM, DL, GW, KH, KN, MD,MN, RR**
Civil Engineering	CE	**AM,AU, BB, BE, BG, BM*, BS, CC, CL, CP, CT, DD, DL*, GA, GC, GK, GN, GS, GW,GZ,HK,IO, KH, KN*, MD*, MG, MI,MJ, MM,MN,NA,ND, NM,NS,PY,RG, RR*, SG, SK*,SM,SS, SV, TK,TM, UV, VB,VM, WR, WS,**
Civil Engineering	CV	**TR**
Computer Science & Automation	CS	**BG**
Computer Science & Engineering	CS	**BM, BS, CP, DL, GW,GZ, KH, KN, MD, MG,MN,ND, NM, NS,PD,PY,SK, SV, TM,TR, WS,RR**
Computer Engineering & Information Technology	CS	CP,NN,SS
Cryogenic Engineering	CR	**KH**
Centre for Educational Technology	ET	**KH**
Design	DE	**GW**
Earth Science	ES	**BM, RR**
Earthquake Engineering	EQ	**RR**
Electrical & Electronics Engineering	EE	**GW,TR, CC, GK, SK**
Educational Technology	ET	KH

Department/Centre	Code	Institution(s) Offering Ph.D. Degree Programme
Electrical Communication Engineering	EC	**BG**
Electrical Engineering	EE	**AM,AU, BG, BM*, CC, CL, CP, CT, DL, GA, GC, GK, GS, GN,GZ, JU*,IO, KH, KN, MD, MG,MJ, MM, MN,NA,ND, NM, NS,PY,RG, RK, RR,SS, SV, TM, VB, WS,**
Electrical Engineering	EP	**VR, MT**
Electronics & Communication Engineering	EC	**BB, BS, CL, CT, DD, GA, GW, GS ,MG, MM, NM, RK, SG, SK, SV, TM, VB, WS**
Electronics & Electrical Comm. Engineering	EC	**KH, SK**
Electronics & Telecommunication Engineering	EC	**JU*, CP, JU**
Electronics Engineering	EC	**AU,MN,VM**
Electronic Design & Technology (centre)	ED	**BG**
Energy (centre)	EN	**GW**
Energy Studies	EN	**DL**
Energy Science & Engineering	EN	**BM**
Engineering Design	ER	**MD**
Environment (centre)	EV	**GW**
Environmental Science & Engineering	EV	**BM**
Food Engineering & Technology	FE	SP
Geology and Geophysics	GG	**KH**
G.S. Sanyal School of Telecommunication	GT	**KH**
Humanities & Social Sciences	HS	**BM, DL, GW, KH, KN, MD,MN, RR**
Humanities	HS	**SK**
Hydrology	HY	**RR**
Industrial Tribology, Machine Dynamics & Maintenance Engineering	TR	**DL**
Industrial & Management Engineering	IM	**KN**
Industrial Design Centre	ID	**BM**
Industrial Engineering & Operations Research	IO	**BM**
Industrial Engineering & Management	IE	**KH**
Industrial Engineering & Production Engineering	IP	**GS, NM**
Industrial Engineering	IE	**BS, NM**
Information & Communication Engineering	IC	**AU**
Information Technology	IT	**MM, NM, SV**
Instrumentation & Control	IC	**CP,NN,TR**
Instrument Design & Development	ID	**DL**
Instrumentation Engineering	IN	**AU, CP, SG**
Instrumentation and Applied Physics	IN	**BG**
Leather Technology	LT	**AU**

Department/Centre	Code	Institution(s) Offering Ph.D. Degree Programme
Management Studies	MS	**MD**
Management Studies	MG	**BG, RR, DL**
Material Research Centre	MR	**BG**
Materials & Metallurgical Engineering	MT	**KN, CP**
Materials Science	MS	**KH, KN**
Mathematics	MA	**BG, BM, DL, GW, KH, MD, RR**
Mathematics & Humanities	MH	**WR**
Mathematics/Statistics	MA	**KN**
Manufacturing Process & Automation	MP	**NN**
Mechanical & Industrial Engineering	ME	**RR**
Mechanical Engineering	ME	**AU,AU, BB, BG, BM, BS, CC, CL, CP, CT, DD, DL, GK, GC, GS, GN, GW,GZ,HK,IO, KH, KN, JU*, MD, MG,MJ, MM, MN,NA, ND,PD, PS,PY, RG, RK*, SG, SK,SP,SS, SV,TK, TM,TR, VB,VM, WR, WS,**
Mechanical & Manufacturing Engineering	MM	**MI**
Metallurgical & Materials Engineering	MM	**MD, MJ,ND, RK, RR**
Metallurgical & Materials Engineering	MT	**KH, SK ,TR**
Metallurgical Engineering & Materials Science	MM	**BM**
Metallurgical Engineering	MT	**VN,VR**
Materials Engineering	MT	**BG**
Metallurgy & Materials Science	MT	**CP**
Mining Engineering	MI	**IS, KH, RK, SK ,VN**
Nuclear Engineering and Technology	NE	**KN**
Ocean Engineering	OE	**MD**
Ocean Engineering & Naval Architecture	ON	**KH**
Paper Technology	PP	**RR**
Product Design	PD	**BG**
Physics	PH	**BG, BM*, DL, GW, KN, MD,MN, RR**
Physics & Meteorology	PM	**KH**
Polymer Science & Engineering	PS	**DL**
Polymer Science & Chemical Technology	PS	**DD**
Production Engineering	PE	**CP, JU*,NA, NM, PS, SG,TR, VB**
Production Technology	PT	**AU**
Paper Technology	PP	**RR**
Reliability Engineering	RE	**KH**
Rubber Technology	RT	**KH**
Rural Development	RD	**KH**
Rural Development & Appropriate Tech.	RD	**DL**

Department/Centre	Code	Institution(s) Offering Ph.D. Degree Programme
School of Information Technology	IT	**KH**
School of Management	MG	**BM,MN**
Super Computer Education & Research	SE	**BG**
Sustainable Technologies (Centre)	ST	**BG**
Systems & Control Engineering	SC	**BM**
Textile Engineering	TX	GZ
Textile Technology	TX	**DL,VM**
Water Resources Development & Management	WR	**RR**

*Specialization have to be indicated while opting for the particular department. Codes for the Specializations are given along with the details corresponding to the particular institution **(Depts. & Field of Specialization)**

IV. ELIGIBILITY CRITERIA

1. **Only candidates (such as lecturers, readers, asst. professors, associate professors and professors) with** a **minimum** of **three-years** teaching experience as full-time regular/permanent teachers of AICTE approved Degree level Engineering Institutions, National Institutes of Technology (NITs) and National Institutes of Technical Teachers' Training and Research (NITTTRs) as on **September 30, 2014 (Tuesday)** are eligible to apply. Admissions to Ph.D. degree programme under QIP are open only to candidates with a basic degree in Engineering or Technology or Architecture or such other qualification.

2. The candidate should satisfy the minimum eligibility criteria prescribed by the individual Department (and/or the Institution) to which admission is sought.

3. Computer Programmers, Systems Programmers, Workshop Staffs, Guest Lecturers, Visiting Lecturers, Teaching Assistants, Ad-hoc/Contract or Part-time Teachers, Research Engineers, Scientific Officers, Technical Assistants, and other such categories of staff **are not eligible.**

4. Teachers of the Major QIP Centres **are not eligible.**

5. Teachers of the Minor QIP Centres **are eligible to apply to Major QIP Centres.**

6. Teachers of the minor QIP Centres are permitted to apply for a field of specialization available in another minor QIP centre, which is not available in their parent department on the specific recommendations of the Department's and Institute's Head stating that a faculty in the particular specialization is required for their Institution. **Candidates completed M. Tech. under QIP programme can not apply before completion of the bond period at their parent Institute.**

V. ADVANCE ADMISSION SCHEME

As per the advance admission scheme for Ph.D. degree programme under QIP, a candidate will receive admission during 2015-2016 session to the Pre-Ph.D. programme and on successful completion of this programme, he will be offered admission to the regular Ph.D. programme during 2016-2017. During the one-year period of the Pre-Ph.D. program, the candidate is required to make maximum of four visits to the institution (to which he/she is offered admission) for a total period of sixty days, to decide on the area of research, to identify guide, and to start preliminary work. During this period, the candidate is to be treated as on deputation by the sponsoring institution. TA/DA as per AICTE norms for the visits would be borne by the Institute where the admission is offered, subject to the receipt of the grants from the AICTE. The question of final offer for admission will be considered during May-July 2016, based on the performance of the candidate during the period of the advance admission.

VI. LIVING EXPENDITURE ALLOWANCE AND CONTINGENCY GRANT

The candidates admitted for the regular Ph.D. degree programme under QIP will receive a sum of Rs. 9,000 per month as Living Expenditure allowance and a contingency grant of Rs.10, 000 per annum for three years.

VII. CONDITIONS FOR ADMISSION

1. Admission is possible only to the **Institutions** and the **Departments** listed in the Information brochure.
2. The **final admission of the candidate will be subject to the clearance and approval by the Admission Wing (Section)** of the **concerned institution** as per its rules and regulations in force at the time of admission.
3. The candidate, if selected, should be relieved from the parent Institution to join the programme in time for the session to which he/she is admitted.
4. The candidate joining the Ph.D. degree programme under QIP on deputation would be entitled to receive his/her salary and allowances, which must be paid by the parent institution sponsoring him/her.
5. **Conditional recommendation by the Principal/Head of the Institution will not be accepted.**
6. The Principal/Head of the Institution of a candidate who is selected for admission should ensure that **the sponsorship certificate** is produced by the candidate at the time he/she joins the course.
7. If a QIP scholar discontinues Ph.D programme, the scholar has to refund the scholarship and contingency received to the AICTE through the QIP Centre, and the parent institution may seek refund of the salary and allowances paid to him for the period he/she attended the programme.

VIII. INSTRUCTIONS FOR COMPLETING THE ON-LINE APPLICATION

General Instructions

1. The candidate should first register by clicking "New Registration". An email confirming the registration will be sent by assigning the application number and a password. The application number and the password are required for subsequent operations. Hence the candidate should remember both of them or keep them at a safe place.
2. Candidate can start filling up the on-line application by logging in through "View/Edit Application".
3. On-line application can be completed in one or more sessions by revisiting the website using the assigned application number and password.
4. The candidate should enter all required information correctly in all fields of the **on-line** application.
5. After filling the fields, the candidate can save the information in between by using the SAVE button. The candidate can edit data in any field till the final submission and printout is taken. The last date for the on-line submission of application is **November 03rd, 2014.**

Personal Information

6. For the Designation field, the candidate should choose one of the following designation codes from the combo box. For designations not covered, the candidate should specify the exact designation under the other designation field, failing which his / her application cannot be considered.

Designation	Code	Designation	Code	Designation	Code
Assistant Lecturer	1	Senior Lecturer	4	Associate Professor	7
Associate Lecturer	2	Reader	5	Professor	8
Lecturer	3	Assistant Professor	6	Other Designation	9

7. After completing the Name, Designation, Department and Address fields (using the pull-down menu) enter Date of Birth; Gender as 'Male' or 'Female'; the category by 'General', 'SC', 'ST', or 'OBC'; put 'Yes' if you belong to Physically Disabled Category and "No' if you do not; Married as 'Yes' if you are married and 'No' if you are single.

Educational Qualifications and Academic Data

8. During the process of entering the application details, additional sub-links are provided in appropriate places. For example, while entering the overall performance of the candidate under 'Educational Qualifications', there will be a link through which the candidate can furnish the semester wise / year wise particulars.
9. For filling Academic data and Additional qualification, if the absolute marks are awarded, then fill, e.g. 650/800 where the total marks obtained is 650 out of total of 800. If the Grade Point Average (GPA) is awarded, fill, e.g. 6.7/10 where 6.7 is GPA obtained on a scale of 10. If the candidate has failed in any subject during any semester examination and cleared that subject in a later semester, the marks obtained in that subject should be added back to the semester in which it was supposed to have been cleared and then the total marks is to be calculated. **Candidate should take the marks of all the semesters for calculating the overall percentage or CGPA (irrespective of the methodology adopted by the university/college in awarding final class/division).**
10. During the entry of details like detailed semester wise / year wise information, detailed teaching experience etc., the candidate has to enter the details for which documents of proof are to be attached.

Institute and Department Preferences

11. A candidate can apply to a maximum of three institutions and a maximum of two departments in each of the chosen Institutes (i.e., maximum of total six options only).
12. Select the Institution by using the pull-down-menu as per the order of your preference. Then enter the programme code desired as per preferred choices with valid code.
13. Appropriate list of 'valid codes' can be viewed using links provided. The Programme code contains 6 characters; the first 2 alphabets identify the Institute, the next 2 alphabets identify the department within the Institute and the last 2 digits identify the field of specialization. For example, a code 'KNEC01' represents a particular field of specialization in the Department of Electronics & Communication Engineering, IIT Kanpur.

Preview of Application

14. Once the complete details about the candidate are entered and saved, the on-line application can be printed. To preview the completed application, the candidate can print a draft copy of the application. He should check the completeness and correctness of the information; if needed, corrections can also be made before the final submission.

Final Confirmations and Printouts

15. After finalizing the contents of the application, the candidate should invoke the FINAL version of the application. Click here for printing the FINAL version of the application. **Once the FINAL version option is chosen, the candidate will not be allowed to modify the contents of the application. The FINAL version should be printed only on A4 sheet with the print orientation as 'portrait'**, and **margins as 20 mm (left, right, top and bottom).** The **print report** contains multiple copies of the application. The first copy corresponds to the 'copy for Principal Coordinator QIP, Centre for Development of Technical Education, Academic Affairs Building, Room No.-303, Indian Institute of Technology Kanpur, Kanpur-208016 (U.P.) and one copy each for the preference code **related to the number of institutions and departments, a candidate proposes to apply to**.

16. The following Table indicates the number of printouts to be taken and the number of sets of enclosures required as **related to the number of institutions and departments a candidate proposes to apply.**

No. of Institutions Chosen	Total No. of Departments (Streams or Specializations) Chosen	No. of applications to be printed and No. of sets of enclosures required
1	1	2
1	2	3
2	2	3
2	3	4
2	4	5
3	3	4
3	4	5
3	5	6
3	6	7

17. In each copy, the candidate should **affix his/her recent stamp-size photograph** in the space provided.
18. The candidate should thoroughly verify the contents of the printed documents and sign at the appropriate places.
19. In the "**Forwarding Note" of the Application Form, the space provided for the Name of the Candidate and Teaching Experience must be duly filled in and signed by the Principal / Head of the Institution along with Office Seal.**
20. Applications submitted without signatures of the candidate and the appropriate authorities with seal, and/or without the required enclosures will **automatically be deemed invalid.**

IX. APPLICATION FEE

A demand draft for Rs 1000/-for General/OBC Category and Rs. 500/-for SC/ST/PD/ Female Candidate, drawn in favour of **'Coordinator, Continuing Education Programme, IIT Kanpur'** payable at '**Kanpur'** should be attached with the form marked as, **Copy for Principal Coordinator** on top of the form. Candidate should write their application number, name, address and courses applied on back side of the DD. Candidate should note that the fee paid other than DD i.e., **by IPO, cheques, etc. are not acceptable.** Application fees once paid cannot be refunded.

X. CHECKLIST FOR EACH COPY OF THE APPLICATION FORM

- **In Forwarding Note, the candidate should check his/her Name, years and months of experience, signature, date, and office seal.**
- *Photographs:* Affix recent stamp size photographs at space provided on all copies of Application Forms including **Copy for Principal Coordinator**.
- *Signatures of the Applicant:* The candidate should sign in all the print-outs at relevant places.
- Candidate should ensure that all information's are properly filled in and required number of print-outs are taken and all copies are to be send to the Principal Coordinator QIP.

Enclosures

1. ***Application Fee*:** DD of Rs. 1000/- for General/OBC Category and Rs. 500/- for SC/ST/PD/ Female Candidate should be enclosed with the **copy of the Principal Coordinator QIP form** only.
2. Candidates belonging to SC, ST or OBC category, must attach an attested copy of the **caste certificate** issued by a **competent authority** as per the Government of India rules.
3. **Physically Disabled** candidates must attach a copy of the **certificate** issued by a **competent authority** as per Government of India rules.
4. Enclose attested copies of all the relevant certificates
    - *Certificates of the Qualifying Examination (Bachelor and Master)and other Degrees*
    - *Age proofing Certificate*
    - *Mark Lists of all years/semesters of qualifying examination (mark sheets clearly showing total marks obtained out of maximum marks according to semester or year)*
    - *Teaching Experience*
    - *Industrial/Research Experience Certificates.*
    - *The certificates of Short Term Courses attended.*
    - *All Research Publications.*
    - *Any other Academic qualifications/Awards etc.*

XI. INSTRUCTIONS FOR DESPATCHING

1. For the convenience of the candidate, a check list is also printed as the last page. One can use this list and ensure the completeness of application. Once completed, the entire bunch (all copies) is to be dispatch to the Principal Coordinator QIP/CDTE, IIT Kanpur along with the DD of the relevant amount.
2. **Before mailing the completed forms, please ensure that each copy of application form and its enclosures are properly fastened with a tag separately at the left-hand top corner.**
3. In case, your applications are submitted by your sponsor, it is your responsibility to ensure that the application is forwarded to the Office of the Principal Coordinator QIP well within time so as to reach **on or before November 10th , 2014 (Monday)**. **Applications received after this date will not be considered.**
4. In case, the candidate has forgotten the password, the candidate should send an email (using the email ID mentioned in the on-line application) to tvp@iitk.ac.in furnishing the following details: Application Number, Name of the Candidate, Date of Birth, and Address for correspondence, Gender and Category. After verification, the candidate will be informed the password through email only.
5. The requisite number of the print-outs of the application submitted on-line, along with the required number of enclosures, as mentioned, should be sent to **The Principal Coordinator QIP, Centre for Development of Technical Education, Academic Affairs Building, Room No.-303, Indian Institute of Technology Kanpur, Kanpur-208016 (U.P.),** preferably by **Speed Post or Courier Service**, to reach the Office **on or before November 10th, 2014 (Monday)**. **Applications received after this date will not be considered**: All the completed forms along with enclosures should be sent only to **The Principal Coordinator QIP, Centre for Development of Technical Education, Academic Affairs Building, Room No.-303, Indian Institute of Technology Kanpur, Kanpur-208016 (U.P.),** For any clarification contact: Phone: 0512 2597795; Fax: 0512 2596209, Email: tvp@iitk.ac.in

XII. LAST DATE

The last date for on-line submission of application is **November 03rd, 2014 (Monday).** Print-outs of on-line filled-in application, including the Copy for Principal Coordinator, with its enclosures, complete in all respect should reach **The Principal Coordinator QIP, Centre for Development of Technical Education, Indian Institute of Technology Kanpur, Kanpur – 208016, on or before November 10th, 2014 (Monday). Applications received after this date will not be considered**.

XIII. PROCEDURE FOR ADMISSIONS UNDER QIP

1. **Short-listing** of the candidates will be done first by the office of the Principal Coordinator, then finally at the Department/Institute concerned. Interview letters will be sent to the short-listed candidates by the Department/institute concerned.
2. **Interviews** will be conducted in the Departments at the individual Institutions. **Schedule of interviews** is provided in the next page. Please note that No **TA/DA will be paid to candidates for** attending the Interviews.
3. **Selections** will be made by the National QIP Coordination Committee based on the recommendations of various institutions.
4. **Final Results** will be available at the web site: **http://www.iitk.ac.in/qip/admission**
5. **Admission** letters will be issued to the selected candidates by the respective QIP centres or Academic sections of the institutions offering admission.

SCHEDULE OF INTERVIEWS FOR ADMISSION TO Ph.D. DEGREE PROGRAMMES UNDER QIP

The following dates of interview at various QIP Centres, finalized by National QIP Coordination Committee, are final and cannot be altered under any circumstances.

S.No	Institute	Interview Date	Day
1	IIT Kharagpur	07-01-15	Wednesday
2	Indian Institute of Engineering Science and Technology, Shibpur	08-01-15	Thursday
3	Jadavpur University, Kolkata	09-01-15	Friday
4	National Institute of Technology, Durgapur	12-01-15	Monday
5	IIT Guwahati	14-01-15	Wednesday
6	National Institute of Technology, Silchar	15-01-15	Thursday
7	National Institute of Technology, Agartala	16-01-15	Friday
8	IIT Delhi	20-01-15	Tuesday
9	Delhi Technological University, Delhi	21-01-15	Wednesday
10	Netaji Subhas Institute of Technology, New Delhi	22-01-15	Thursday
11	Shri Guru Gobind Singh Institute of Engineering & Technology, Nanded	23-01-15	Friday
12	S.V. National Institute of Technology, Surat	27-01-15	Tuesday
13	National Institute of Technology, Warangal	28-01-15	Wednesday
14	Government College of Engineering, Amravati	29-01-15	Thursday
15	UVCE, Bangalore	31-01-15	Saturday
16	IISc Bangalore	02-02-15	Monday
17	BMS College of Engineering, Bangalore	03-02-15	Tuesday
18	The National Institute of Engineering, Mysore	04-02-15	Wednesday
19	National Institute of Technology Karnataka, Surathkal	05-02-15	Thursday
20	Basveshwar Engineering College, Bagalkot	06-02-15	Friday
21	Manipal Institute of Technology, Manipal	09-02-15	Monday
22	IIT Madras	11-02-15	Wednesday
23	Pondicherry Engineering College, Puducherry	12-02-15	Thursday
24	Thiagarajar College of Engineering, Madurai	13-02-15	Friday
25	Anna University, Chennai	16-02-15	Monday
26	Govt. College of Engineering, Salem	18-02-15	Wednesday
27	National Institute of Technology, Tiruchirapalli	19-02-15	Thursday
28	College of Engineering Trivandrum, Thiruvananthapuram	20-02-15	Friday
29	PSG College of Technology, Coimbatore	23-02-15	Monday
30	Coimbatore Institute of Technology, Coimbatore	24-02-15	Tuesday
31	National Institute of Technology, Calicut	25-02-15	Wednesday
32	Govt. Engineering College , Kerala	26-02-15	Thursday
33	TKM College of Engineering, Kollam (Kerala)	27-02-15	Friday
34	Rajiv Gandhi Institute of Technology, Govt. Engineering College, Kottayam	02-03-15	Monday
35	IIT Bombay	04-03-15	Wednesday
36	Veermata Jijabai Technological Institute (VJTI), Mumbai	05-03-15	Thursday
37	Sardar Patel College of Engineering, Mumbai	09-03-15	Monday
38	College of Engineering, Pune	10-03-15	Tuesday
39	Govt. College of Engineering, Aurangabad	11-03-15	Wednesday
40	Walchand College of Engineering, Sangli	12-03-15	Thursday
41	Visvesvaraya National Institute of Technology Nagpur	13-03-15	Friday
42	Samrat Ashok Technological Institute, Vidisha	16-03-15	Monday

S.No	Institute	Interview Date	Day
43	SGS Institute of Technology & Science, Indore	17-03-15	Tuesday
44	PDPM Indian Institute of Information Technology Design & Manufacturing, Jabalpur	18-03-15	Wednesday
45	Madhav Institute of Technology & Science, Gwalior	19-03-15	Thursday
46	National Institute of Technology, Rourkela	20-03-15	Friday
47	Veer Surendra Sai University of Technology, Burla	23-03-15	Monday
48	Indira Gandhi Institute of Technology, Sarang, Odisha	24-03-15	Tuesday
49	Guru Nanak Dev Engineering College, Punjab	25-03-15	Wednesday
50	Giani Zail Singh College of Engg. & Tech. Bathinda (Punjab)	26-03-15	Thursday
51	Sant Longowal Institute of Engg. & Tech. (Deemed University), Punjab	27-03-15	Friday
52	Malaviya National Institute of Technology, Jaipur	30-03-15	Monday
53	IIT Kanpur	31-03-15	Tuesday
54	Harcourt Butler Technological Institute, Kanpur	01-04-15	Wednesday
55	Motilal Nehru National Institute of Technology, Allahabad	06-04-15	Monday
56	IIT BHU, Varanasi	07-04-15	Tuesday
57	Madan Mohan Malaviya University of Technology Gorakhpur	08-04-15	Wednesday
58	Kamla Nehru Institute of Technology, Sultanpur	09-04-15	Thursday
59	Indian School of Mines, Dhanbad	10-04-15	Friday
60	IIT Roorkee	14-04-15	Tuesday

XV. DEPARTMENTS & FIELDS OF SPECIALIZATION AT VARIOUS INSTITUTIONS

- The departments offering admission to Ph.D. Degree programmes at various institutions and the fields of specialization in the departments are listed in the Tables.
- Specializations mentioned indicate only areas of interest and are not exhaustive. There may not be admissions open to all the areas indicated, and candidates, if found suitable, may be admitted to related areas also.

The details given are subject to variation and change from time to time and only those operating in the respective institutions at the time of actual admissions are applicable. Candidates desirous of more information on the matter may write to the individual institution or visit their website.

1. Indian Institute of Science, Bangalore 560 012 – BG

In all cases, the minimum eligibility is Second class or equivalent grade in the Bachelor's as well as in the Master's degree.

Code	Department	Fields of specialization	Minimum Qualification
BGAE01	Aerospace Engineering	Theoretical and Experimental Fluid Mechanics, Applied Aerodynamics, Hypersonic and High Enthalpy Flows, Computational Fluid Dynamics, Flight Mechanics of Aircraft and Helicopters; Dynamics and Control of Aerospace Vehicles, Orbital Mechanics, Space Robotics, Guidance, Avionics, Radar and Electromagnetic Systems, Parallel/Distributed Processing and Neural Networks Applications, Optimization & Estimation Techniques in Aerospace Systems; Aerospace Propulsion, Basic and Applied Combustion, Experimental and Computational Studies on Reactive Flows, Combustion of Propellants, Composite Structures, Smart structures, Non-destructive Evaluation, Finite Element Methods, Fracture Mechanics, Structural Integrity and Reliability, Structural Dynamics and Aeroelasticity, Rotor Crafts Dynamics.	M.E./M.Tech. or equivalent degree in Aerospace, Mechanical, Electrical, Electronics, Chemical, Computer Science, Civil.
BGAS01	Centre for Atmospheric & Oceanic Sciences	Monsoon Dynamics, Tropical Convection, Satellite Meteorology, Dynamics of Oceans, Coupled Ocean-atmospheric Systems; Climate Modeling, Boundary Layer, Aerosols and Climate.	M.E./M.Tech. or equivalent degree in Mechanical, Civil/Aerospace /Chemical Engineering, Atmospheric and Oceanic Sciences.
BGCH01	Chemical Engineering	Alternative Energy; Biochemical Engineering; Biophysics; Catalysis; Complex Fluids; Alleviation of Environmental Pollution; Nanotechnology; Optimization and Control; Modeling, Design and Intensification of chemical processes; Molecular Simulations; Theoretical Biology; Thermodynamics; Transport Phenomena	M.E./M.Tech. or equivalent degree.
BGCE01	Civil Engineering	**Geotechnical Engineering**: Earthquake Geotechnical Engineering, Geo environmental Engineering, Physico-chemical Aspects and Constitutive Modeling of Soil Behavior, Foundations, Earth and Earth Retaining Structures, Ground Improvement Techniques, Geosynthetics, Mechanics of Granular Media, Numerical Modeling of soils and rocks, Risk and Reliability Assessment of Geohazards, Soil Dynamics, Rock Mechanics, Experimental Mechanics. **Water Resources and Environmental Engineering**.: Water Resources Systems, Climate Hydrology, Surface and Ground Water Hydrology, Vadose Zone Hydrology, Open Channel Flows, Urban Water Distribution Systems, River Mechanics, Environmental Hydraulics, Water Quality Modeling, Contaminant Transport in Surface and Ground Water Flows. **Structural Engineering**: Structural Mechanics, Finite Element Analysis, RC and Prestressed Concrete, Masonry Structures, Structural Dynamics, Non-Linear and Stochastic Dynamical Systems, Earthquake Engineering, Structural Safety, Fracture Mechanics of Concrete, Materials in Civil Engineering, Low Carbon Materials, Structural Health Monitoring, Contact Mechanics, Computational Plasticity.	M.E./M.Tech. or equivalent degree in Civil.
BGCS01	Computer Science and Automation	**Theoretical Computer Science-**Algorithms, complexity theory, graph theory, algorithmic algebra, automata theory, combinatorial geometry, computational geometry, computational topology, coding theory, cryptology, graph theory, logic, formal verification, computational biology. **Computer Systems and Software-**Computer architecture, multi-core systems and programming, parallelization, embedded systems, energy aware computing, operating systems, storage systems, database systems, distributed computing, cloud computing, systems security, mobile and wireless systems, cyber-physical systems, performance modeling, graphics, visualization, compilers, program analysis, software engineering. **Intelligent Systems-**Pattern recognition, machine learning, convex optimization, graphical models, soft computing, data mining, information retrieval, bioinformatics, social network analysis, network science, reinforcement learning, stochastic control and optimization, stochastic simulation, electronic commerce, game theory, auctions and mechanism design, cognitive systems	M.E./M.Tech. or equivalent Degree in Computer Science and / or Engineering, or Electronics or Electrical Communication Engineering or Electrical Engineering or Information Technology or Information Sciences or allied disciplines.

Code	Department	Fields of specialization	Minimum Qualification
BGEC01	Electrical Communication Engineering	**Communication and Networking**: Information theory, distributed joint source-channel coding; error control coding including space-time codes, network coding,codedmodulationandpseudorandomsequences,Wireless mobile communication, CDMA, multiuser detection, , MIMO, OFDM, cooperative communications. Communication networking: modeling, analysis, optimization and control of resource allocation in wireline and wireless networks; scheduling in networks; quality of service in heterogeneous networks; cross-layer design in wireless networks; energy efficient protocols. Wireless sensor networks: Self organization and distributed signal processing, system architectures for various applications, distributed computing algorithms for sensor networks. Communication protocols-specification and verification, A applications to communication networks and their management, mobile agents. Multimedia communication. **NanoelectronicandVLSI:**Nano-CMOStechnology,non-classicaltransistor design, transistor variability in nanoelectronics, adaptable circuit design, integrated MEMS sensors, VLSI architectures for high performance computing, low power techniques in hardware for embedded systems and system-on-chip, formal and in formal verification technologies, fault-tolerant and self-healing system design, bio-electronics, Technologies for pattern recognition classification, and machine learning. **Photonics:** Fiber Optics communication, DWDM networks, Integrated optics, MOEMS; Fiber Bragg grating Sensors, Nano-photonics, Bio Photonics. **Signal Processing:** Speechandaudio coding, speech recognition and enhancement, Music classification, auditory modes and Hearing aids. Wavelets: application to data transmission, signal detection and denoising. MultiMate signal processing, filter bank design. Statistical signal processing; signal detection and estimation, space-time (MIMO) signal processing algorithms with applications to wireless communications, underwater acoustic systems, acoustic signal separation. Biomedical signal processing. Processing of biomedical signals using non linear dynamical techniques. Abnormality detection in ECG and EEG signals. Connectivity study of network sinthebrain. **Microwave Engineering:** Passive and active circuits (RF and microwave). Microwave antennas, Fractal designs in electromagnetic, MEMS and micromachining (RF MEMS), Composite materials for microwave applications, Computational electromagnetic.	ME / M. Tech. or equivalent degree in Electrical Communication, Electronics and Communication, Telecommunication, Electronics, Electronic Instrumentation, Biomedical Engineering, Computer Science and Engineering, Electrical Engineering.
BGEE01	Electrical Engineering	**Power Systems and Power Electronics:** Distributed Generation: Wind-Solar integration, Power quality, Harmonic suppression, Reactive power control, Intelligent systems applications to Power Systems protection, Power Electronics and Drives, Switch mode power supplies. **High Voltage Engineering:** EHV Power Transmission, Overvoltage Protection, Lightning Protection, Computational Electromagnetic, Gas Insulated Systems, Partial Discharges, Insulation Engineering, Condition Monitoring and Diagnostics for HV Power Apparatus, Nanodielectrics, Environmental applications of electrical discharges. **Systems Science and Signal Processing:** Pattern Recognition, Data Mining, Machine Learning, DSP Theory and Applications, Sparse Signal Processing & Compressive Sensing, Image and Video Analysis, Computer Vision, Medical Imaging and Analysis, Optimisation, Speech Processing, Sensor Networks.	ME / M. Tech. or equivalent degree in Electrical, Electronics Communication, High Voltage Engineering, Instrumentation, Computer Science, Information Technology or Biomedical Engineering Or related disciplines.
BGED01	Electronic Systems Engineering	**Power Electronics & Drives:** Control of inverters, multi-level inverters for drives, renewable energy, power supplies **Signal and Information Processing:** Information theory, coding and signal processing for magnetic and optical nano- memories, mathematical biology and applications, quantum information processing and systems architecture. **Communication Networks:** Physical layer security, network science, peer-to-peer and delay-tolerant networking, function computation on networks, optimal data transport in sensor, wireless and mesh networks, modelling energy harvested networked embedded and cyber physical systems, Internet to Things. **Computational Nanoelectronics:** Compact modeling, Device Simulation, Electro Thermal Simulation, Non-Equilibrium Green Function, Tunnelling Devices, 2D Materials, Ab-initiosimulation	ME / M.Tech. or equivalent degree with Electronics as one of the subjects of study.

Code	Department/ Centre	Fields of specialization	Minimum Qualification
BGIN01	Instrumentation and Applied Physics	Sensors and related instrumentation, Nanoscale Imaging, Super-resolution Microscopy, Fluorescence Microscopy, Microfludics, Atomic Force Microscopy, Printed and flexible electronics, Electronic Circuits, Bioinstrumentation, Carbon nanotubes, Nano-Micro Systems, Tomographic imaging for biomedical and other applications, Lasers and Optical metrology, Switching devices for information storage, Mass spectrometry, Photo voltaic, Electrical and thermal contact resistance Microeletromechanical Systems(MEMS), Fibre-Bragg Grating Sensors.	ME/M.Tech. Instrumentation Electrical and Electronic Engineering OR M.Sc. o equivalent degree i Physics/Applied Physics/Engineering Physics/Biophysics/Materials Science
BGMG01	Management Studies	Bayesian Statics, Empirical Finance, Energy & Environmental Policy and Management, Entrepreneurship, Human Resource Management, Industrial Economics, Innovation Management, Intellectual Property Commercialization, Knowledge Management, Logistics and Supply Chain Management, Marketing, Operations Management, Operations Research, Organizational Behavior, Project management, Public Policy, R&D Management, Reliability Theory, Strategic Management, Technology Management.	BE/B.Tech or equivalent degree in any discipline or Master's degree in Economics, commerce, Mathematics, Statistics, Psychology, social Work, Operation Research, Computer Science/ Application or MBA or equivalent or PGDBM (2 year full time program)
BGMR01	Materials Research Centre	Preparation of Advanced Materials by Physical, Chemical and Nonequilibrium Routes. Feroelectric and Semiconducting Thin Films, Multilayers and Hard Coatings; Nanomaterial's and Composites, Self Assembly and Nanopatternings; Theoretical and Computational Materials Science. Ferroic materials, glasses and glass-ceramics, Electro and Nonlinear Optics. Magnetic materials, Biomaterials.	M.Sc. or equivalent degree in Materials Science, Chemistry or Physics or ME/ M.Tech/ MSc. (Engineering or equivalent degree in materials Science / Engineering, Ceramic Engineering and Technology.
BGMA01	Mathematics	Partial Differential Equations, Homogenization, Controllability, Nonlinear Dynamics and Chaos, Time Series Analysis with Applications to Neuroscience, Probability and Stochastic Processes, Stochastic Control, Stochastic Dynamic Games, Random Matrix Theory, Functional Analysis, Operator Theory, Algebraic Topology, Differential Topology, Commutative Algebra, Algebraic Geometry, Harmonic Analysis, Several Complex variables, Differential Geometry, Mathematical Finance, Low Dimensional Topology, Numerical Analysis, Number Theory, Combinatorics, Statistical Mechanics, Representation Theory, Combinatorial Topology	M.Sc. or equivalent degree in Mathematics, Statistics, Physics or any branch of Mathematical Sciences or BE / B.Tech. or equivalent degree (provided they have good aptitude for Mathematics).
BGME01	Mechanical Engineering	Experimental Stress Analysis and Fracture Mechanics, Tribology; Mechanisms, Robotics and CAD, Fluid Mechanics, Turbulence, Heat Transfer, Combustion, Laser Diagnostics applied to Thermo-fluid Sciences, Refrigeration and Air Conditioning, Dynamics, Micro Electro-Mechanical Systems (MEMS), Nano Tribology, Structural Optimization and Design, Mechanical Properties of Materials, Bio- mechanics, acoustics and noise control.	ME / M.Tech. in Mechanical/Aeronautical/Civil/ Material Engineering.
BGMT01	Materials Engineering	Mechanical Behavior of Metals, Ceramics, Polymers Glasses and Thin Films, Biomaterials Engineering, Polymer Nanocomposites, Organic Electronics Sensors. Mineral Processing, Biohydrometallurgy, Extractive Metallurgy, Process Modeling Physical Metallurgy, Phase Stability and Transformation, Diffusion, Solidification.	ME / M.Tech. or equivalent degree in Metallurgical, Mineral, Chemical, Ceramics or Mechanical, Electrical, Electronics or Materials Science/ Engineering or Biotechnology, Polymers
BGPD01	Product Design	Computer Aided Engineering Tools for Product Design, Vehicle Crashworthiness and occupant Safety, Occupational Health and Safety, Product Safety, Computer Aided Ergonomics, Human Physiology, Digital Human Modelling, Biomechanics, Kinesiology, Biosensors, Computer Aided Fit and Usability Studies, Haptics Integrated Design interfaces, knowledge Management, Product Life Cycle Management, Artificial Intelligence in Design, Design for Environment, Design Creativity Collaborative Design, Design Synthesis, Requirements Engineering, Design Methodology.	ME/M Techor EquivalentdegreeinDesignanybranch of Engineering, Architecture, Instrumentationandmedicineor Master'sdegree in physics, Mathematics, Computer Sciences, Physiology Psychology or BE / B TechorequivalentdegreeinDesign,anybranch of Engineering, Architecture *Instrumentation*.

Code	Department	Fields of specialization	Minimum Qualification
BGPH01	Physics	(A)Experimental studies in I. Condensed Matter Physics II. Atomic, Optical Physics, and Specific areas include: Raman and other Spectroscopy, Fast Ionic Conductivity, Manipulation of Matter by Light, Laser Cooling and trapping of atoms, Ion trapping, Precision Laser Spectroscopy, Magnetism, Spintronics, Magnetic thin films, Magneto-transport, quantum transport in low- dimensional and disordered materials, the metal-insulator transition, Magnetic Resonance Phenomena, Nano science and nanomaterial's, Superconductivity in bulk as well as thin films, Semiconductors, Ferro electricity, Crystal Growth Studies, Nonlinear Optical Materials, Phase Transition Studies, High Pressure and Low Temperature Studies, Study of Low Dimensional Materials, Amorphous Systems, Soft Condensed Matter: colloids, surfactants and biological materials, Polymer Physics, Surface X-ray scattering, surface phase transitions, Thermoelectrics. (B) Theoretical Studies on a variety of aspects of condensed matter physics, in particular; Strongly Correlated Systems, Quantum many-body theory and magnetism, exotic order and quantum criticality; Phase transitions, equilibrium statistical physics; Disordered and Amorphous Systems, the glass transition, neural networks, Spatiotemporal Chaos and Turbulence in fluids, plasmas and cardiac tissue; Soft condensed matter: colloids, surfactants, membranes, liquid crystals, vortex lattices; biological physics: the mechanics of living matter; Molecular modeling of soft and bio-materials	ME / M.Tech / M.Sc(Engineering or equivalent degree or M.Sc. or equivalent degree in Physics, Biophysics, Biotechnology, Mathematics, Chemistry or Polymer Science or B.E./ B.Tech. or equivalent degree or B.Sc or equivalent degree followed by AMIE, Grad, IETE, AMIIChE, AMIIM, AMAeSI.
BGSE01	Super Computer Education and Research Centre	Compiler Optimization, Computer Aided Design for VLSI Systems, Computational Electromagnetics, Computer Architecture, Database Systems, Embedded System-on-Chip Architectures, Cloud Computing, Grid Applications, Grid Computing and Grid Middleware, High Performance Computing, Graphics and Scientific Visualisation, Mathematical Software/Libraries, Network and Information Security, Video Analytics, Virtualization, bioinformatics, computational biology, biomedical diagnosis/imaging, numerical analysis, photonics, Pervasive Computing, Quantum Computing, and Scientific Computing, Machine Learning, and Natural Language Processing.	ME/M.Tech. or equivalent degree in any discipline
BGST01	Centre for Sustainable Technologies	Water quality and sustainable supply; Water andsanitation; Renewable energy; solar, biomass combustion and gasification, biomethanation, bio- fuels, etc. Energy planning, demand side management, energy efficiency; Alternative building technologies and materials, energy efficient and environmentallysound technologies; Climate-responsive architecture/buildingtechnology; Building Integrated Photovoltaics (BIPV) and Green Buildings; Building-comfort studies in tropical regions; Waste management; reuse and recycling; Natural Resources Management; Climate change mitigation; Aquatic biodiversity; Ecotoxicology and remediation.	M.Arch or M.E./M.Tech/M.Sc. (Engg.) In Mechanical, Civil, Chemical including Renewable Energy, Environmental Engineering, Energy Studies or MSc (Environmental Sciences)

2. Indian Institute of Technology Bombay, Mumbai 400076 – BM

In all cases, the minimum eligibility is a First class or equivalent (Min. 60%) Master's Degree in Engineering / Technology (55% for SC/ST) OR a First class or equivalent (Min. 60%) Master's degree in Science (55% for SC/ST) or a first class or equivalent (Min. 60%) in Bachelor's degree in Engineering / Technology (55% for SC/ST).

Code	Department	Fields of Specialization	Minimum Qualification
BMAE01	Aerospace Engineering	• Aerodynamics • Dynamics and Control • Aerospace Propulsion • Aerospace Structures	Master's degree in Aerospace, Mechanical, Civil Engineering Electrical/ Electronics. (If academic credentials are exceptional and the candidate has proven research capabilities, Bachelor's degree (First Class) holders in the mentioned disciplines may also be considered to be eligible. Exceptions: Graduates/Postgraduates with Electrical / Electronics, instrumentation background will be considered only for Dynamics & Control specialization. Graduates/Postgraduates with civil engineering background will be considered only for Aerodynamics and Aerospace structures specializations.
BMCE01	Civil Engineering (Code no. of specialization to be indicated in the datasheet)	Transportation Systems Engineering	M.Tech or Equivalent degree in Civil Engineering The minimum eligibility is a First class or equivalent (Min.60%) Master's Degree in Engineering/Technology (55% for SC/ST)
BMCE02		Geotechnical Engineering	
BMCE03		Water Resources Engineering	
BMCE04		Structural Engineering	
BMCE06		Ocean Engineering	
BMCH01	Chemical Engineering	Research Areas i. **Process Systems Engineering:** Process Simulation, Optimization, Process Integration and Scheduling, Energy Conservation and Optimal Resource Management. Artificial Intelligence and Mathematical Modelling, Multi-scale Modelling, Systems Identification and Process Safety Analysis, Nonlinear control, fault diagnosis. **ii. Biotechnology & Bio-Systems Engineering:** Metabolic & Genetic Engineering, Bio-separations, Bioinformatics, Systems Biology, Drug Discovery, Enzymology, Bioprocess Development, Bio-fuels **iii. Materials Engineering:** Polymer materials, Polymer Reaction Engineering Polymer Processing, Polymer Physics, Polyurethane , Rubber, Polymer Rheology, Ceramics, Polymer Biomaterials, Drug Deliver, Food Engineering Microscopy Nano-composites, Statistical Thermodynamics, and Supercritical Fluids. **iv. Catalysis & Reaction Engineering:** Catalysis, Multiphase Reaction, Bio-reaction Engineering and Reactor Modelling. Process intensification & reactive distillation, micro-reactors v. **Transport, Colloids & Interface Science:** Granular flows. Power Mixing, Membrane Separations, Rheology of Complex Fluids, Colloids, Sol-gels, Emulsions & Foams, Paints and Coatings, Microstructural Engineering, Aerosols, Electro-hydrodynamics, Fluid Mechanics & Stability, Computational Fluid Dynamics, Heat & Mass transfer, Porous media, and Surfactants, micro-fluidics vi. **Energy and Environment:** Climate change, Coal Gasification, Energy Integration, Green Engineering, Renewable Resources, Waste Management, Pollution Control, Air Pollution Prediction & Control, sustainability studies. **vii. Thermodynamics and Molecular Simulations:** properly prediction through molecular simulation, fuel cell, catalytic properties, biological systems, polymers	Master's degree in Engg / Technology or Bachelor's degree in Engg / Tech. or Master's degree in Science disciplines consistent with the research areas of the departments

Code	Department	Fields of specialization	Minimum Qualification
BMCS01	Computer Science and Engineering	Computer graphics, computer vision, image understanding and retrieval, Database and information systems, hypertext mining and information retrieval, data dissemination networks, Programming languages and compilers, Computer networks, performance modeling and distributed systems, Algorithms, combinatorics, graph theory, Artificial Intelligence, natural language processing, machine learning, Software engineering, Formal specification, design and verification biologically inspired computing.	M.E / M.Tech. in CS&E with at least 60% marks or M.E /M.Tech. in any branch with 5 years teaching experience in CS&E.
BMCY01	Chemistry	Theoretical / Computational Chemistry – Main Group - Transition Metal Chemistry. Organometallics – Electrochemistry / Conducting Polymers – Ultrafast Spectroscopy – Organic Synthesis – Peptide Synthesis, Enzyme Mechanism = Homogeneous / Heterogeneous Catalysis – Physical inorganic Chemistry – Protein Folding. Theoretical Organic Chemistry – Photochemistry, Photobiology – Statistical Mechanics – Chemical & Biosensors, Single Molecule Spectroscopy, Structural Biology, Bioorganic, Bioorganic and Biophysical chemistry.	M.Sc. or equivalent degree in Chemistry/ Physics/ Biochemistry / Biotechnology. Candidates with Master degree in science must have valid GATE score to become eligible for the Teaching/ Research Assistantship provided by the Institute.
BMES01	Earth Sciences	Mineralogy Geochemistry and Ore Deposits, Structural Geology, Igneous and Metamorphic Petrology, Engineering Geology, Hydrology and environmental geology, Sedimentlogy, Stratigraphy and Micro-Paleontology, Geomorphology and Remote Sensing, Mathematical Geology and Geostatistics, Rock Magnetism and Geology, Seismology and Exploration Geophysics, Geothermal Energy Resources, Geomagnetisum, Well –Logging, Petrophysics, Numerical Modeling Geophysics, Volcanology, Seismic Modeling.	1) M.Sc./ M.Tech. degree in Geology/ Geophysics/ Geo-Chemistry 2) M.Sc./ M.Tech./ M.Sc. (Tech)/ M.Phil (2yr) degree in Physics, Chemistry, Mathematics, Life Sciences, Marin Sciences, Atmospheric Sciences or equivalent and having Geology/ Physics/ Geochemistry at the B.Sc. stage as principle subjects.
BMEE01	Electrical Engineering	**Communication Engineering**: Communication Systems, Communication Networks and Internet, Computational Electromagnetics, Image Processing and Computer Vision, Microwaves, RF and Antennas, Multimedia Systems, Optical Communication and Photonics, Signal Processing, Speech Processing, Wireless and Mobile Communication, Information Theory and Coding, Magnetic Resonance Imaging.	I. For General category students and/ or for students where no concession in academic performance is called for eligibility requires meeting ANY ONE of the following criteria as regards performance in the qualifying degree. 1. a minimum of 60 percent marks in the final academic year of the programme. 2. a minimum of 60 percent marks in aggregate or as specified by the university (any one of them) 3. a first class as specified by the university. 4. a minimum CPI of 6.0 on the scale of 10; with corresponding proportional requirements when scales are other than on 10 – for example, on a scale of 8, the minimum will be 4.8 For Students from the SC/ST category the corresponding criteria are: 1. a minimum of 55 percent marks in the final academic year of the programme 2. a minimum of 55 percent marks in aggregate or as specified by the university (any one of them) 3. a first class as specified by the University. 4. a minimum CPI of 5.5 on the scale of 10; with corresponding proportional requirements when the scales are other than on 10 – for example, one a scale of 8, the minimum will be 4.4

Code	Department	Fields of specialization	Minimum Qualification
BMEE02	Electrical Engineering	**Control & Computing**: Linear systems Theory, Optimal Control & Optimization, Modeling and Identification of Dynamical Systems, Control of Distributed Parameters Systems, Non-Linear Systems, Modern Filter & Network Theory, Behavioral Systems Theory, Computational Methods in Electrical Engineering Software and System Reliability Cryptography and Security, GPU-based Computing.	
BMEE03		**Power Electronics & Power Systems**: FACTS, HVDC and Power Quality, Distributed Generation, Power System Restructuring, Wide Area Measurements and System Protection, EMI/ EMC, Coupled Field computations, Electrical Machines; Modeling, Analysis, Design and Control, Special Machines, Power Electronic Converters, Electric Drives, Power Electronics for Non-Conventional Energy Sources, Reliability in Power Systems and Power Electronic Systems, Smart Grids for Energy Harvesting.	
BMEE04		**Microelectronics**: Devices & IC Technology, Reliability of Electronics Devices and Circuits, Device Simulation and Modeling, VLSI and System Hardware Design, CAD Tools, MEMS Design and Technology (including Bio-MEMS), Flash Memory Devices, Organic Semiconductor Devices, CMOS Devices, Spintronic Devices, Photovoltaic Devices, Material Growth and Characterization.	
BMEE05		Electronics Systems: Electronic Instrumentation, Signal Processing Applications, Speech and Audio Processing, Biomedical Electronics, Embedded System Design.	II. The qualifying degrees are as following B.E/B.Tech/M.E./M.Tech. Biomedical Engineering, Computer Science, Computer Science and Engineering, Computer Engineering, Electrical Engineering, Electronics Engineering, Telecommunications Engineering, Instrumentation Engineering, Engineering Physics, Materials Science and Engineering. Master of Science (M.Sc) Mathematics, Physics, Electronics/Electronic Sciences III. The admission of a student as a Ph.D Candidate shall be confirmed only after he/she has successfully completed the prescribed coursework and the comprehensive qualifier examination. A student who is unsuccessful in the comprehensive qualifier even after the prescribed number of attempts shall have to discontinue the Ph.D Programme.

Code	Department	Fields of specialization	Minimum Qualification
BMMA01	Mathematics	**Algebra:** Commutative Algebra, Hilbert functions, Blowup algebras, Local cohomology, Hopf, Algebras, Coxter Groups. Homological algebra, Gorenstein rings. **Analysis:** Functional Analysis, Operator Theory, unbounded subnormals, Hilbert modules, Numerical Functional Analysis, Approximate Solutions of operator equations and eigenvalue problems, Spline Theory, Numerical Functional Analysis, Real Analysis, Mean periodic functions, Generalized integrals. Several Complex Variables **Combinatorics:** Combinatorics, Posets, Generating functions, Polyhedral Combinatorics. Extremal Combinatorics, Probabilistic methods, Design theory, Arithmetic and Boolean circuit complexity, Randomness and Lower bounds, Explicit constructions of pseudorandom combinatorial objects **Geometry and Topology:** Algebraic Geometry and Combinatorics, Schubert varieties, Linear codes, Varieties over finite fields, Algebraic Topology, Operads, Differential Geometry, Harmonic Manifolds, Algebraic & Differential Topology, Topology of Matrix varieties. Stable homotopy theory, Algebraic K-theory, Combinatorial Topology. **Number Theory:** Number Theory, Automorphic Forms, Representation theory of p-adic groups. Representations of Algebraic Groups, L-functions, Converse Theorems. **PDE and Numerical Analysis:** Numerical Analysis, Applied Mathematics, Finite Element Methods, Finite volume methods. Hyperbolic systems of quasilinear partial differential equations, Non-linear waves, Partial Differential Equations, Shock waves in hyperbolic systems of conservation laws, partial integro-differential equations, Visco-elastic fluid-flow problems. **Statistics and Probability:** Statistical Data mining, Computational Biology, Biostatistics, Bioinformatics, Probabilistic optimization problems in Molecular Biology, Reliability Theory, Industrial Statistics, Construction of reliability test plans, Statistical Inference, Geostatistics, Modeling bivariate distributions, Stochastic Differential Game Theory, Risk-sensitive control theory, Stochastic control Mathematical Finance, Applied Probability, Poisson and compound poison approximations, Estimation after selection, Reliability test plan. Statistical signal processing, Time series analysis, Reliability analysis, High dimensional multivariate analysis, Non-Parametric curve estimation, Statistical machine learning. Large dimensional random matrices, Free probability, Extreme value theory and Statistics.	First Class Master degree in Maths/ Statistics/ Computer Science
BMME01	Mechanical Engineering	**Thermal and fluid Engineering:** Convective and Radiative Heat Transfer, Two-Phase Flow, Design of Thermal Equipments and Systems, Numerical Techniques, Modeling and Analysis, combustion and Flames, Fuel injection, Petrol and Diesel Engines, Power Plant, Nuclear Engineering, Reactor Neutronics Reactor Heat Transfer, Steam Generator, Fluid Mechanics, Fluid Machinery, Hydraulic controls, Micro Fluidics, Fuel Cells, Computational Fluid Dunamics, Refrigeration, AC Systems Cryogenics, Absorption, Heat Pumps	***For all fields of pecialization:*** i) B.Tech / M.Tech for equlvalent degree in Mechanical Engineering with First Class (or 60% minimum) at UG & PG levels (55% for SC / ST) ii) B.Tech. / M.Tech. degree or equivalent in Production Engineering / Industrial Engineering / Aerospace Engineering with First Class (or 60% minimum) at UG & PG levels (55% for SC / ST) may be considered. **iii)** Candidates with an outstanding academic record and a Post-Graduate degree in other branches of Engineering / Technology may also be considered for research areas consistent with their academic background and special interests of the Development.
BMME02		**Design Engineering:** Stress Analysis using Analytical and Numerical Methods, Studies of Failure Due to Fatigue and Fracture, Fracture Mechanics, Application of Finite and Boundary Element Methods, System Modeling, control and Automation, Kinematics, Machine Dynamics, Synthesis of Mechanisms, Robotics, Mechatronics, Tribology Design of Elements and Systems, Optimization, CAD, Interactive Graphics, Vibration, Noise and Acoustics, MEMS, Vehicles Dynamics, Smart Materials and Structures, NDT.	
BMME03		**Manufacturing Engineering:** Machining, Casting, Welding and Forming Processes. Tool Design, Rapid Prototyping and Tooling, Modeling and Simulation of Manufacturing Processes, Manufacturing Automation and Control, CAD/CAM, CNC, Feature Based Modeling, Computer Aided Process Planning Intelligent Product Design and Manufacturing Applications of AI in Manufacturing, Flexible Manufacturing Systems, Modeling and simulation of Manufacturing Systems, CIMS product Lifecycle Management, Inventory and Supply Chains Management, Quality Engineering, Planning Scheduling Queuing, Management of Operations, Maintenance Management.	

Code	Department	Fields of specialization	Minimum Qualification
BMMM01	Metallurgical Engineering and Materials Science	**i. Metals** Process analysis, instrumentation and control, Iron and Steel making, deformation behavior and microstructure evolution during creep and superplasticity, mineral processing and extractive metallurgy, metal forming, mechanical behavior, welding, physical metallurgy, phase transformation, structure property relationship, thermomechanical processing and texture analysis. **ii. Ceramics** Electronic ceramics, bioceramics, glass ceramics, ceramic foams, industrial ceramics, IR transmitting glasses, near net shape forming, gel casting, rheology of suspensions. **iii. Semiconductors and magnetic materials** Devices of thin film elemental semiconductors and alloy systems, surface treatment and surface engineering, chemical vapor deposition, structure property correlation in nanocrystalline magnetic materials, magnetoresistor materials In addition, research into materials for sensors and batteries, superconductors, synthesis and processing of ion conductors, materials for energy generation and storage is going on in the Dept. **iv. Polymers and Composites** Polymer blends, Polymercarbon nanotube composites, metalmatrix composites, structure property relations. **v. Wear and Corrosion** Fracture and failure, localized corrosion, alloy development passivity, Stress Corrosion cracking, weld related corrosion, protective coating, high temperature corrosion **vi. Modeling and Simulations** Modeling of metallurgical processes, heat and mass transport, modeling of metal forming,Optimization, Monte Carlo simulations, Dislocation dynamics simulations	B.Tech./M.Tech.in Metallurgical, Ceramic, Chemical, Electrical, Electronics, Electrochemical, Mechanical / Production / Manufacturing and Polymer Science / Technology or M.Sc. in Chemistry, Materials Science, Physics, Corrosion Science & Engg. and surface Engineering
BMPH01	Physics	Condensed Matter Physics (Theory)	In all cases the minimum eligibility is a First Class or equivalent (Min. 60%) Master's Degree in Engineering/ Technology (55% for SC/ST) OR a First Class or equivalent (Min.60%) Master's degree in Science (55% for SC/ST) or a First Class or equivalent (Min.60%) in Bachelor's degree in Engineering/ Technology (55% for SC/ST)
BMPH02		Condensed Matter Physics (Experimental)	
BMPH03		Laser, Optics and Spectroscopy	
BMPH04		Nuclear Physics (Experimental)	
BMPH05		Particle Physics	
BMPH06		Statistical Physics	

Code	Department	Fields of specialization	Minimum Qualification
BMHS01	Humanities and Social Science	**Economics:** Managerial Economics, Applied Econometrics, Monetary Economics, Open Economy Macroeconomics, International Trade & Finance, Indian Economy, Environmental Economics, Industrial Economics, Multinationals and Technology Transfer, Industry – Environment Linkages, International Trade, Socio Economic Impacts of Climate Change, Development economics, Natural resource and environmental economics, Water resource Economics, Climate change, Green Accounting, Environmental Policy, Financial Economics, Monetary Economics, Macro Economics, Macro Economics, Industrial Economics, and Corporate Investment , Applied Econometrics, Micro econometrics, Health Economics, Development Economics **English:** Critical Theory, Aesthetics, Translation Theory, Creativity and Creative Writing discourses, Science as a Cultural Construct in Literary/Performative Genres with special focus on Science-Drama, Novel, Victorian Studies, Postmodern Literature and Intertextual theory, Syntactic theory, First language acquisition, Linguistic deficits, Conservation of endangered language(especially Dravidian minority languages)Women's Studies, Autobiography Studies, "Crisis" in English Studies, African American Writing, Partition Literature, South Asian Fiction in English, Cultural Studies, Gender Studies, Film Studies, Regional Literatures in India **Philosophy:** Philosophy of Language, Contemporary Western Philosophy, Meta-Ethics, Buddhism, Classical Indian Philosophy, Comparative Religion, Comparative Philosophy, Vedanta Philosophy, Philosophy of Mind, Analytic Philosophy, Contemporary Western Philosophy, Contemporary Indian Philosophy, Existentialism, Phenomenology, Continental Philosophy, Applied Ethics, Twentieth Century Continental Philosophy, Philosophy of Artificial Intelligence, Cognitive Science, Wittgenstein, Alfred Korzybski, Philosophy and Popular Culture, Ethics **Psychology:** Social Psychology, Organizational Behavior Human Resource Development, Organizational Psychology, Organizational Behavior, Human resource management, personality , Cognitive Psychology, Clinical Psychology, Neuro Psychology, Ergonomics, Event Related Potential, Social Psychology, Fertility, Health Behaviours, Role of Psychology in Development **Sociology:** Political Sociology, Technology and Development, Rural Sociology, Environmental Sociology, Sociology of religion, kinship and family; Indian society, Development Studies, Law and Governance, Urban Studies,Vulnerability and Adaptation to Climate Change, Women and Gender Studies, Research Ethics, Urban Sociology, Ethnicity and Multiculturalism, Sociological Theory, Sociology of Development, Environmental Sociology, Social and Environmental Movements, Environmental Politics with a focus on Social inequality and Natural Resource Conflicts especially in Rural India., Issues of livelihood and problems of marginalized class and Political Ecology, Caste today, religious institutions, Hierarchy/Stratification, Sociology in/of India, Contemporary Karnataka. **Sanskrit:** Sanskrit language, Paninian Grammar, Philosophy of language, Aesthetics in Sanskrit Texts, Astronomy (Jyotisha), Mathematics (Ganita), Logic (Nyaya-sastra), Philosophy (Advaita-Vedanta), Meta-Physics, Self-development, Application of Non-linear dynamics	M.A./M.Com/M.Sc/ B.Tech. with minimum of 60% marks or equivalent grade at the qualifying examination In case of SC/ST category of candidates, it is 55%
BMBS01	Bioscience & Bioengineering	**BIOTECHNOLOGY (BT)** **Research Areas:** Enzyme kinetics and enzyme secretion, microbial metabolism and regulation, aromatic hydrocarbon metabolism and genetic engineering, enzyme inhibitor design, peptide synthesis, protein structure, function and engineering; yeast molecular biology, transcriptional regulation of gene expression; microtubule dynamics and cancer chemotherapy, immunology, signal transduction, Glycobiology; molecular and membrane biochemistry; proteomics and systems biology, bacterial cell division, protein aggregation and neurodegenerative diseases, computational biology of nucleosome dynamics, Chromatin assembly and statistical dynamics, cytoskeletal dynamics, chromosome segregation during mitosis and meiosis in yeast. Regulation of gene expression in the malaria parasite, bioinformatics of parasite genomes.	**Minimum Eligibility for Admission:** I) First Class or 60% marks (55% for SC/ST) in M.Sc or equivalent degree in subjects related to Life Sciences / Physics / chemistry or B.Tech Biotechnology with a) A valid GATE score (eligible for Institute TAship / RAship) or A valid CSIR / UGC / DBT JRF (eligible for FA category) or b) A valid ICMR JRF (not linked to ICMR project) (eligible for FA category) OR c) Two years of relevant post M.Sc research experience (eligible only for project positions) OR d) UGC / CSIR (Lectureship) eligible only for project position ii) First Class or 60% marks (55% for SC/ST) in M.Tech of equivalent degree in Biotechnology.

Code	Department	Fields of specialization	Minimum Qualification
BMBS02		**BIOMEDICAL ENGINEERING (BME)** **Research Areas:** Currently fundamental and applied research is being conducted in the broad areas of. Bioinstrumentation for diagnostics and therapeutics,, Physical system modeling and analysis. Biomedical transducers and sensors including biosensors and bio MEMS devices, Cardiac electrophysiology and muscle mechanics, Development and validation of novel biomaterials and implantable devices, prosthetic devices including aids for the handicapped, Signal processing, Telemedicine and knowledge based systems. Nano medicine, Drug delivery, Nano biotechnology. Tissue engineering, biomechanics and mechanobiology, microfluidics and Lab-on-a-chip systems, computational neurophysiology, modeling of microtubule dynamics.	**Minimum Eligibility for Admission:** M.Tech / M.E. or B.Tech / B.E. in Biomedical, Chemical, Computer Science, Electrical, Electronics, Telecommunications, Instrumentation and Mechanical Engineering, and Engineering Physics. M.Sc. or equivalent in biochemistry, Biophysics, Biotechnology, ceramics, Chemistry, Electronics Egronomics, Material Science, Mathematics, Molecular Biology, Physics and Physiology First Class / Division in MBBS / BDS degree, occupational Physiotherapy, with AIMS (PG Entrance Test) / MCI entrance examination for MD / MS (for Medical graduate) / MBBS with MD / MS, MDS M.Pharm, B.Pharm with entrance examination GPAT Applicants desiring Institute financial support should have cleared GATE (for engineering and science graduates) or AIIMS / MCI / GIPMER / PGI- Chandigrach / AFMC – Pune post graduate entrance examinations. Eligibility / rank certificates are required for all such entrance examinations. * B Pth with M Pth with MOTh
BMEV01	Environmental Science and Engineering	Environmental Monitoring, Industrial Air & Water Pollution Control, Solid and Hazardous Waste Management, Air & Water Quality Modeling, Environmental Systems Optimization, Environmental Microbiology & Biotechnology, Bioremediation, Indoor Air Quality, Aerosol Science and Technology, Environmental Impact Assessment and Global Issues.	Master of Technology/Engineering Bachelor of Engineering degree in Agricultural, Chemical, Civil, Energy, biotechnology, Environmental, Mechanical Metallurgical and Mining Engineering or a Master of Science degree in Atmospheric Science, Biochemistry, Biotechnology, Chemistry, Earth Sciences, Environmental Toxicology, Environmental Sciences, Meteorology, Microbiology and Physics for MSc graduates, Mathematics is mandatory at Higher Secondary / Intermediate / (10+2) level.
BMIO01	Industrial Engineering and Operations Research	The group is interested in research related to modeling, quantitative analysis and optimal resource allocation from decision problems in deterministic and stochastic contexts. Broad areas of application are in supply chains, logistics, transport including railways, manufacturing systems, finance, services, infrastructure and other industrial systems; application of quantitative methods in quality and maintenance management systems; development and application of decision support, intelligent and knowledge-based systems. The specific problems of research interests include: production planning, scheduling and control systems; management of inventories in production, distribution and service systems; industrial scheduling, facilities planning, project management, quality management, materials management and productivity management; operations planning and control related to CMS, MRP, ERP, flexible assembly, FMS, JIT; Supply chain analysis, reverse logistics, closed-loop supply chains and RFID applications, product variety management.	a) First class Master's degree in any branch of Engineering with adequate exposure to Industrial Engineering and Operations Research. b) First class M.Sc. in Mathematics, Statistics or Operations Research with excellent academic record c) First Class Bachelor's degree in any branch of Engineering with an excellent academic record.

Code	Department	Fields of specialization	Minimum Qualification
		Operations Research applications in management of technology and resource allocation; Convex optimization; mixed-integer programming; Markov decision processes; optimal control in deterministic and stochastic systems; (differential) game theory; applications of game theory; modeling and simulation of supply chains, manufacturing and service systems; theory and applications of distributed and hybrid simulations, discrete event and system dynamics simulations; applied stochastic models; scheduling and control of railways and other transport operations; time tabling of services, crew and vehicle scheduling for transport operations; optimization and design problems arising from e-commerce, including auctions and mechanism design for electronic exchanges; risk analysis and contract design; revenue management; quantitative models for financial engineering. Theory and applications of neural nets and fuzzy systems in manufacturing and management; development and applications of modern information systems for managing manufacturing, supply chain and service organizations. The IEOR programme is unique in its contemporary flavor, with new courses in Financial Engineering, Supply Chain Management, Game Theory, Markov decision process, System Dynamics, Neural Networks and Fuzzy Logic, Services Management, Manufacturing systems to name a few. The programme is equally strong in background building, with updated courses in Optimization Techniques, Stochastic Models, Simulation, and Knowledge-based systems.	
BMSC01	Systems and Control Engineering	• Large scale systems, system reduction, nuclear reactor control, sliding mode control (continuous & discrete), power systems stability & control, modeling, control & implementation of smart structures, space launch vehicles – stability & control, gas turbines – stability & control, flexible manipulators, stability & control of multirate output feedback based control (POF/FOS). • Robust stability and control especially using quantitative feedback theory (QFT) techniques, nonlinear system analysis and control and reliable computing using interval analysis techniques. • Optimal control, constrained and optimization based control, in particular, stochastic model-predictive/receding-horizon control. • Nonlinear and adaptive control, geometric mechanics, Lagrangian and Hamiltgonian mechanics • Cooperative control of multi-agent systems, resource allocation, team theory and its application, game theory, decentralized control, cooperative and network control. • Reconfigurable hardware, embedded control systems, robotic path planning algorithms, hardware/software codesign. • Switched and hybrid systems, control under communication and computation constraints; stochastic control; applications of stochastic process in engineering systems.	First class M.E. or M.Tech. in Aerospace / Chemical / Electrical / Electronics / Instrumentation / Mechanical / Metallurgical Engineering / Systems & Control Engineering. Candidates interested in pursuing a Ph.D. should identify and communicate with atleast a couple of faculty members of the group with whom their research interests match. The names of these faculty members should preferably be mentioned in the application form. This is a pre- requisite for short-listing

Code	Department	Fields of specialization	Minimum Qualification
BMEN01	Department of Energy Science and Engineering	**Energy Efficiency / Improvements in conventional** **Energy Systems:** Heat pumps, Energy integration, Process integration for resource optimization, Pinch Analysis-Development of techniques for optimization of Utility systems, Demand Side Management/ Load Management in the Power Sector, Variable Speed Drives, Power Generation and Systems Planning, Energy Management and Auditing, Efficient Motor Drive Systems, Electronics Ballasts, Static VAR compensators, Illumination control, Power Electronics in Energy Efficient Systems, Electric Vehicles, Boilers and Fluidised Bed Combustion, Exhaust Heat Recovery, Cogeneration, Building Energy Management, Efficient Air Conditioning Systems, Hydrogen Generation and Storage **Renewables**: Biomass Gasifier Design, Development and Testing, Pyrolysis for liquid fuels and chemical, CNG Kit development, Testing of Solar Collector and systems, Passive Solar Architecture, Development of Carbon PV cell, Decentralised Power Systems-Grid Integration Issues, Hybrid Systems for Rural Electrification, Wind Energy, Low Cost Solar Drier, Fuel Cells, Thin film solar cells, Carbon nano tubes for hydrogen storage, Solar photovoltaic concentrator, Biomass conversation to Gaseous Fuels and 2nd Generation Biofuels, Development of Engines for SVO, Biodiesel, Dual fuelling etc., Biodiesel manufacturing process. **Clean Coal Technologies :** (UCG, Chemical Looping, Combustion) Co_2 requestrations **Nuclear** : Nuclear Safety, Nuclear Waste management, Thermal Hydraulics Research, Computer Simulation Models for Analysis of Transients in Pressurised Heavy Water Reactor	M.Tech. Degree in any of the following branches of engineering: Aeronautical/ Aerospace, Chemical, Civil, Electrical, Mechanical, Metallurgical. M.Tech. in Energy Studies M.Sc. in Chemistry/ Physics/ Mathematics with a good academic record
BMMG01	School of Management	Accounting, Economics, Innovation and Entrepreneurship, Financial Management, General Management, Human Resource Management, Information Systems, Intellectual Property Rights, International Business, Management of Information Technology, Marketing Management, Operations Management, Organization Behavior, Project Management, Quality Management, Statistics and Operations Research, Strategy and Business Policy, Technology Management, Organisational Excellence Competiveness	*One of the following:* *1) *M.Mgt/MBA/ME/M.Tech/M.Phil or equivalent with first Class or 60% marks/6 CPI (55% marks/5.5 CPI for SC/ST) ** *2).*B.E./B.Tech/ Four year Bachelor Degree in any discipline or M.Sc./M.A./ M.Com/Masters Degree, in any disciplinewith first Class or 60% marks/6 CPI (55% marks/5.5 CPI for SC/ST) OR CA/ICWA/CSand a Bachelors Degree in any discipline withfirst Class or 60% marks/6 CPI (55% marks/5.5 CPI for SC/ST). Candidates meeting this requirement must also fulfill one of the following additional requirements: .Valid GATE Score .CAT score taken within the last two years, with over 80 percentile in each section .GMAT score taken within the last five years, with a score of at least 650 .UGC-CSIR JRF award or fellowship .Minimum of 2 years of professional work experience (for SW/SF/IS category) .Minimum 6 months of project work experience in IIT Bombay (for PS category)

Code	Department	Fields of specialization	Minimum Qualification
BMID01	Industrial Design Centre	Some of the specific areas include: ❖ Studies in Objects and Cultural notions ❖ Indian product tradition ❖ Environments for Learning ❖ Information Visualization ❖ Perception and Cognition ❖ Product Semantics ❖ Cognition, Mental Imagery and Design Problem Solving ❖ Bionics ❖ Materials and Processes ❖ Design Strategy and Innovation ❖ New Product Development ❖ Collaborative Methodology for Innovation ❖ Human-Computer Interaction ❖ HCI – Software Engineering Overlap ❖ Interaction Design for Indian Needs ❖ Print Media, Illustrations, Multimedia, E-learning, ❖ Story Telling in Traditional & Digital Media, ❖ Design Management and Design Methods ❖ Collaborative Social and Learning Environments ❖ Product Interaction Design Innovation ❖ Graphic Language and Information Visualization ❖ Way-Finding and Navigation Systems ❖ Typography and Typefaces ❖ Culture and Story Telling ❖ Form and Product Aesthetics ❖ Repositioning of Bamboo Craft ❖ Creativity and Product Innovation ❖ Holistic Thinking in Design ❖ Automobile, Consumer and Furniture Ergonomics ❖ Workstation Ergonomics and Design ❖ Musculoskeletal Disorders ❖ Manual Material Handling ❖ Products for the People with Special Needs	First Class or 55% marks (50% for SC /ST) In M.Des / M.Arch / M.Tech. / M.Phil / MFA / Post-Graduate Diploma in / Design of NID, Ahmedabad and equivalent OR B.Des / B.Arch / B.FA / MA /M.Sc / Under - Graduate Diploma in Design of NID, Ahmedabad or Equivalent degree with related work with a valid CEED Score Candidate with a minimum of three years of relevant professional experience CEED Score can also be considered.
BMSR01	Centre of Studies in Resources Engineering	Research Areas I) Application Area a) Water Resources b) Terrain Evaluation, Land-use planning and monitoring c) Rural Development and Agro-informatics d) Minerals Exploration e) Natural Hazard of Droughts, Desertification, Landslide, Avalanche, Earthquake, Tsunami etc. f) Marine Resources and Ecology g) Snow, Glaciers and Atmosphere h) Applications of Microwave Remote Sensing II) Theoretical Areas i) Digital Image Processing ii) Digital Photogrammetry and Cartography iii) Geospatial Technologies iv) SAR Interferometry and Polarimetry v) Mineral Systems Studies vi) Global Positioning Systems vii) Climate Change Studies	Candidates with First Class or 60% marks (55% marks for SC/ST) in • B.Tech / B.E in any branch of Engineering OR • M.Sc. in any branch of Science with Mathematics as a subject upto 10+2 level OR • M.Tech. / M.E. in any branch of Engineering

3. Indian Institute of Technology Delhi, New Delhi 110016 – DL

In all cases, the minimum eligibility is Master's degree in Engineering/Technology or Master's degree in Science / Humanities with a minimum of 60% (6.75 CGPA) marks in aggregate (of all the year / semesters of the qualifying examination) or equivalent grade point average (as determined by IIT Delhi). For SC/ST/PD category candidates, the minimum performance in the qualifying degree is relaxed from 60% to 55% (from 6.75 to 6.25 CGPA).

Code	Department / Centre	Fields of specialization	Minimum Qualification
DLAM01	Applied Mechanics	**(a) Design Engineering**: Design Engineering, Design Method and Engineering alternatives, Reliability Engineering. **(b) Fluid Mechanics**: Bio-fluid mechanics, Computational Aerodynamics, CFD- Computational Fluid Dynamics (includes DNS-Direct Numerical Simulation, LES-Large Eddy Simulation, DES-Detached Eddy Simulation, RANS-Reynolds Averaged Navier-Stokes etc.), Internal Flows-Aircraft engine intake ducts and combustors, Hydrodynamic stability theory, Low-dimensional models and chaos, Micro-air Vehicles, Optical flow diagnostics (PIV-Particle Image Velocimetry and Micro PIV), Pipeline Engineering, Pollution Dispersion, Supersonic and Hypersonic Flows, Turbulence, Turbulent boundary-layer stability and control, Two phase flows. **(c) Materials Science**: Crystallography, Fracture Mechanics, Metal foams, physical metallurgy, severe plastic deformation, grain growth, phase transformations. **(d) Solid Mechanics**: Composite structures and materials, Computational methods in solids, Dynamics and Non-linear analysis of structures, off shore structures, Experimental stress analysis, Impact mechanics, Functionally graded materials and structures, Smart structures, damage mechanics, Fluid Structure Interaction, Buckling / Post buckling of plates and shells, soft material, cell and Tissue Mechanics, Nano Mechanics.	Master's degree in Mechanical, Civil, Chemical, Aeronautical, Metallurgy, Naval Architecture, Applied Mechanics, Engineering Mechanics or Design Engineering.
DLAS01	Centre for Atmospheric Sciences	Monsoon dynamics, Micro meteorology, Global and regional climate modeling, Meso-scale studies and local weather prediction, Air quality models, Impact assessment and Environment risk assessment studies, Wind driven ocean circulation, Air-sea interaction, Storm surge prediction, Oceanic fronts and tides.	M.Tech / M.Sc. / B.Tech (with valid GATE Score) degree in Mechanical, Civil, Chemical & Computer Science & Engineering, Physics, Chemistry, Mathematics, Statistics, Oceanography, Environmental Science, Engineering Physics, Atmospheric Science, Meteorology and related fields. For B.Tech or equivalent the minimum eligibility is 70% marks or 7.5 CGPA.
DLAL01	Centre for Applied Research in Electronics	(a) Thermo- Acousto-Optic Non-destructive Characterization, and Biosensors, Microelectronics and MEMS. (b) Microwave Circuits, Antennas, RF MEMS, Ultra wide band systems, MMICS, RFID, Device Modeling. (c) Signal processing and underwater acoustics, airacoustics, Speech and Audio Signal Processing, Communications.	Master's degree with the Preceding degree in appropriate area with First class throughout. Master's degree with the preceding degree in Electrical, Electronics, or Communication Engineering with First class throughout.
DLBM01	Centre for Biomedical Engineering	Biomaterials, Biomechanics, Drug delivery, Polymers in Medicine and Surgery, Biosensors, Bioimaging, Vascular rehabilitation, Technology in mass healthcare, and Tissue Engineering.	Master's degree in any branch of Engineering / Science / Pharmacy / Mathematics/ M.B.B.S. with 60% MD /MS with first class and B.Tech or equivalent having above 70% are also eligible to apply.
DLBC01	Biochemical Engineering & Biotechnology	**Bioprocess Engineering**: Engineering analysis of enzymatic, cellular, metabolic processing involving bioprocess kinetics, Modeling for development of reactor operation strategies & process optimization, Use of Innovative bioreactor designs, Process integration & scale-up for economic production of metabolites, Monitoring and control of process parameters, Animal cell technology, Plant cell/hairy root cultivation in bioreactors for strategic metabolite production, Metabolic flux analysis, Bioenergetics, Biotransformation. **Downstream Processing**: Novel product separation strategies based on sorption, Liquid-liquid extraction, Ultra-filtration, Affinity methods. **Molecular Biology and Recombinant DNA Technology**: Development of recombinant cultures for hyperproduction of metabolites and commercially important enzymes (β glycosidase, laccase, protease) Protein engineering, Heterologous protein production (including therapeutics in Escherichia coli, Pichia pastoris), Cancer molecular biology, microRNA research and RNA technology, Bioinformatics and Genomics. **Bioremediation and Environmental Biotechnology**: Prospecting of microbes & their application in wastewater treatment and agricultural.	M.Tech / M.S. degree in Chemical / Biochemical Engineering, Biotechnology, Food Technology.

Code	Department / Centre	Fields of specialization	Minimum Qualification
DLEN01	Centre for Energy Studies	Electric Power Systems, Energy Planning, Fuel Technology, Fuel Cells, Biomass Utilization, Utilization of alternative fuels in IC engines, Solar Thermal Utilization, Photovoltaic, Plasma Science & Technology, Energy Conservation, Energy and Environment Management.	Master's degree in Mechanical, Civil, Agriculture, Chemical, Electrical / Electronics, Energy, Environment, Instrumentation & Control Engineering, Physics, Chemistry, Automobile Engineering, Computer Science & Engineering.
DLMG01	Management Studies	General Management, Economic Development, Indian Financial System, International Business, Competitiveness, Corporate Planning, Corporate Governance, Organization Management and Development, Organizational Behavior, Human Resources Management, Organizational Culture, Leadership and Business Ethics, Financial Management, Corporate Finance, Portfolio Management, Security Analysis, Management of Investment, International Finance, Production and Operations Management, Optimization Techniques, Facility Layout/Location Problems, Manufacturing Systems, Project Management, Risk Management, infrastructure Projects, Mergers and Acquisitions, Productivity and Efficiency Analysis, Marketing Management, Sales Management, Strategic Marketing Management, IPR Management, Longitudinal and Lateral Thinking, Information Systems & Technology, E- Business, E-Governance, Telecom Systems Management, International Telecom Management, Flexible Systems Management, Management of Change, Entrepreneurship Management & Development, Creativity and Innovation Management, R&D Management, Managerial Ethics, Environment Management, Management of Technology.	Master's degree in any branch of Engineering/Technology or Master's degree in Science, Commerce,
DLPS01	Centre for Polymer Science & Engineering	Polymer Science & Technology	M.Tech in Polymer Science & Engineering or Plastic & Rubber Technology or Chemical Engineering, Chemical
DLRD01	Rural Development & Technology	Artisanal technologies and rural industries, Biogas Production and enrichment and animal power, Dairy and food processing, Renewable energy technologies, Clean Cookstoves, Rural energy systems, Biomass and Environment, Microbial Biotechnology, Ecological Sanitation. Traditional Knowledge, Bamboo based housing, Bioremediation, Waste Management, Biofertilizers and Biopesticides, Tissue culture, Mushroom technology, Algal Biofuels, Food Quality & Safety, RADID COMPORTING, Grass root innovations, Eco-friendly Grain Storage System	Master's degree in any discipline of Engineering / Technology or Science.
DLCH01	Chemical Engineering	Hydrogen and fuel cell technology, Unconventional energy resources, Solid oxide fuel cells, Bio-renewable chemicals and biofuels, Catalytic Hydrocarbon conversion processes, Green industrial processes, Heterogeneous catalysis and Reaction kinetics, Chemical reaction engineering, Interfacial science and engineering, Electrochemical engineering, Chemical Product design, Mass transfer, Thermodynamics, Membrane synthesis and separation, Electrochemical systems synthesis and separation, Composites and materials, nanotechnology, Multiphase reactor engineering, Process intensification, Multiphase flows, Computational fluid dynamics, Numerical methods, Molecular simulations, Transport phenomena, transport at Nanoscale, Structure-property Solvophobic Interactions and Self-Assembly, Instabilities, Adhesion, Debonding, Dewetting and Pattern Formation of Soft Thin Films, Self-organizations, of complex fluids, Granular materials, Process systems engineering Process operations, Planning and scheduling of batch and continuous processes, Modeling and optimization, Evolutionary computation, Meta-heuristic algorithms, Hydrodunamic stability, Theoretical/computational polymer physics, dynamics of complex fluids, Polymer processing, Colloidal interactions and Nanoscale engineering, Molecular Self-assembly, Microfluidics, Nanolithography, Polymer Physics, Biopolymers under flow, Polymer Nanocomposites, Flow through porous media, Reservoir simulation, Enhanced oil recovery, Automotive catalysis, Air pollution control, Water treatment, Environmental engineering, pollution-prevention technologies, Biosimilars, Bioprocessing, Quality by Design (QbD), Process Analytical Technology (PAT), Multi-variate Data Analysis (MVDA)	Master's degree in chemical Engineering.

Code	Department / Centre	Fields of specialization	Minimum Qualification
DLCY01	Chemistry	Physical Chemistry, Organic Chemistry, Inorganic Chemistry, Biochemistry, Analytical Chemistry, Theoretical Chemistry, Materials Chemistry	Master's degree in Chemistry with at least 60% marks or CGPA of 6.75 on a ten point scale.
DLCE01	Civil Engineering (code number of the specialization to be indicated in the data sheet)	Construction Engineering and Management	Master's degree in Civil Engineering or MBEM, SPA or equivalent.
DLCE02		Engineering Geology	Master's degree in Civil Engineering or in Applied Geology.
DLCE03		Environmental Engineering	Master's degree in Civil or in Environmental Science or Chemical Engineering or Biochemical & Biotechnology.
DLCE04		Offshore Structures.	Master's degree in Civil Engineering
DLCE05		Rock Engineering.	Master's degree in Civil or Mining Engineering or in Applied Geology
DLCE06		Geotechnical and Geoenvironmental Engineering	Master's degree in Civil Engineering
DLCE07		Structural Engineering	Master's degree in Civil Engineering
DLCE08		Remote sensing	Master's degree in Civil, Agricultural, or Mining Engineering
DLCE09		Transportation Engineering	Master's degree in Civil Transport Engineering/ Transport Planning/ Urban Planning.
DLCE10		Water Resources Engineering	Master's degree in Civil or Agricultural Engineering.
DLCS01	Computer Science and Engineering	Computer Architecture, Design Automation and VLSI, HW-SW Co-design, Embedded Systems Design, Parallel Processing, Image Processing, Artificial Intelligence, Location Based Services, Computer Vision, Computer Graphics and Animation, Semantics of Programming Languages, Machine learning, Databases, Information Retrieval, Data Mining, Social Network Analysis, Computer Networks, Wireless Networks, Systems and Network Security, Design and Analysis of Algorithms, Optimization, Computational Geometry, Computational and Systems Biology, Computational Logic, Operating Systems, IT for Development, Mobile Computation, Verification, Concurrency, Complier Design, Virtualization and Cloud Computing.	Master's degree in Computer Science, Electronics Engineering, Mathematics or Physics with formal background in Computer Science or MCA. Excellent academic record i.e. ≥ 72.5% or 8.0 CGPA in qualifying degree.
DLEE01	Electrical Engineering	Computer Architecture, Parallel Processing, Multimedia, Embedded/Cyber physical Systems Computer and Communication Networks, Communications, Signal Processing, Image processing, Computer Vision, Pattern Recognition, Machine Learning, Biometrics, Bioinformatics Optical Communications, Control Systems, Biomolecular Circuits and Systems, Intelligent Control, Nonlinear Control, Robotics, Systems Theory, VLSI, Biological Neural Networks, Analog and RF integrated circuits, Device Physics and photonics, Electrical Machines and Drives, Power Electronics, Power Systems, Power quality generation, Distributed generation & Power generation from renewable sources.	Master's degree in an appropriate discipline with excellent academic record.

Code	Department / Centre	Fields of specialization	Minimum Qualification
DLHS01	Humanities and Social Sciences	Development Economics, Macroeconomics, Microeconomics, Endogenous growth, Labour economics, Trade Policy, Discrimination, Health and Nutrition, Empirical Economics, Health Economics, Economics of Education, Demography & Population Economics, Issues of Labour, Industrial Development, Regional Development, Indian Economics Macro and International Development, Sociology of Culture and Knowledge, Sociology of Development, Environmental Sociology, Sociology of Social Movements, Social Anthropology of Medicine, Globalization and Transnationalism, Civil Society and Democratizations Sociology of Religion and Violence, Sociology of Agriculture Technology and Rural Development Policy, Sociology of Information and Communication Technologies (ICTs) for Development, Visual Anthropology/Sociology, Economic Sociology, Technology, Work and Society, Gender Studies, Cultural Studies, Performance Studies, New Media Studies, Science and Technology Policy, Energy and Environmental Policy, Law, Technology, Society, Socio-Legal Studies, Regulation of Technology, Environmental Law + Policy, Climate Change, Disaster Management and Risk Reduction, Modernist and Postmodernist Literature, Indian English Theatre, Indian Writing in English, Contemporary Fiction, Postcolonial Literature, Philosophy of Literature, Phonetics and Phonology, Language Pedagogy, Multilingualism, Computational Linguistics, Language Variation, Formal Syntax and Semantics, Language Acquisition, Cognitive Studies, Philosophy of Language, Epistemology, Metaphysics, Ethics, Aesthetics, Continental philosophy, Phenomenology, Hermeneutics, Philosophy of Science, Philosophy and Film, Philosophy of Mind and Cognition, Wittgenstein, Metaphysics of the Self, Religion and Development, Buddhism (including Buddhism in the Himalayas and Political Buddhism), Philosophy of Culture and History, Social and Political Philosophy, Tibet and Peace Studies, Positive Psychology, Social Psychology.	MA with 1st class in the relevant Subject.
DLID01	Instrument Design and Development Centre	CAD and Simulation of Electronic Systems, Microprocessor Applications, Power Electronics and Control, Electric Drives, Electromagnetic Sensors and Instrumentation, Smart Sensors and Sensors Networks, Digital System Design and DSP Applications, Digital Holography, Digital Speckle Pattern Interferometry, Flame Tomography, Fiber-Optic Sensors, Optical Coherence Tomography, Optical Metrology, Diffractive Optics, Aspheric and Free form Optics and their Applications, Design Methodology and Management, Computer Aided Product Design, Ergonomics, Graphic Design, Passive Solar Architecture, Environment Design, Human Computer Interface, Disaster Management, Designs and Emotions, Design and Culture, Design for user Experience, Effective Interface Design, Design for Customer persuasion and e-commerce, Soft computing applications in product design, Sustainable product design, transportation Design for sustainability, Design Innovation.	Master's / Bachelor's degree in Electrical, Electronics, Mechanical, Applied Optics, Instrumentation, Opto-electronics, Design Engineering, Physics, Or M.Des. degree. For B.Tech or equivalent the minimum eligibility is 70% marks or 7.5 CGPA.
DLTR01	Industrial Tribology, Machine Dynamics & Maintenance Engineering	**Tribology:** Tribology of materials & machine components, Wear Mechanisms and wear modeling, Surface Engineering, Boundary & Hydrodynamic lubrication, EHD lubrication, Lubricant characterization & analysis, Pneumatic conveying of bulk materials, Operational problems like erosion & degradation, etc. **Maintenance Engineering and Machine Dynamics:** Condition based maintenance, vibration, acoustic emission, temperature and wear debris monitoring techniques, maintenance planning and control, computer aided maintenance, Maintenance audit, Reliability, Availability and Maintainability (RAM) engineering, Vibration & noise analysis and control, Risk analysis and safety, Non-destructive testing, Failure analysis & residual life estimation, Performance and Dynamic studies of machine elements and equipment like pumps, compressors, turbines, etc, Design for maintenance, etc.	Master's Degree in Engineering (Mechanical, Chemical, Industrial).

Code	Department / Centre	Fields of specialization	Minimum Qualification
DLMA01	Mathematics	Pure Mathematics, Applied Mathematics, Statistics, Operational Research, Theoretical Computer Science.	Master's Degree in Mathematics, Statistics, or Operational Research or Computer Science, MCA, B.Tech in Computer Science, M.Tech in Computer Applications / M.Tech in Computer Science. For B.Tech or equivalent the minimum eligibility is 70% marks or 7.5 CGPA. 1st Class in B.Sc and M.Sc (or 6.75 CGPA in 10 point scale)
DLME01	Mechanical Engineering	Design, Production, Thermal Engineering	Master's Degree in Mechanical Engineering / Relevant engineering discipline to be approved by the department.
		Industrial Engineering	Master's Degree in any Engineering discipline / any relevant non-engineering discipline e.g. MBA, MCA etc.
DLPH01	Physics	**Materials and Condensed Matter Physics:** Thin Films, Materials and Devices, Novel Functional Magnetic Materials, Nanomaterials, Lattice Dynamics, Semiconductors and Amorphous Materials, Electronics Ceramics, Microwave, Absorbing Materials, Microwave Processing, Quantum Functional Materials, Superconductivity, Nanomagnetism and Spintronics, Spin Dynamics, Charge Carrier Dynamics and Electronic Structure Studies of the Correlated Electron Systems, e.g., Fe-based high-Te superconductors, Complex oxides, etc. **Optics and Photonics:** Holography, High Density Data storage, Liquid Crystals, Nonlinear Phase Conjugation, Optical Information Processing, Optical Data Security, Nonlinear Optics, Nonlinear guided Wave Optics, Solutions, Quantum Optics, Fiber Optics, Integrated Optics, Fiber Optics Sensors and Biosensors, Fiber optics Components, Nanophotonics, Laser Spectroscopy and Applications, Terahertz Spectroscopy and Applications, Ultrafast Dynamics, Laser Processing and Fabrication, Green and Biophotonics, Photonic Metamaterials, Bio-Medical Imaging, Inverse Problems in Imaging, Optoelectronics. **Plasma Physics:** Particle Acceleration, Nonlinear Waves and Instabilities in Plasma, Thermo Nuclear Fusion, Microwaves and Plasma Interaction, Solitons in Plasma, Space Plasmas, Terahertz (THz) Radiation Generation, Hall Thrusters, Interaction of Plasmas with Materials. **Theoretical Physics:** Mathematical, Statistical Mechanics and Computational Physics, Theoretical Studies in ultra-cold atoms, Nuclear Physics Particle Physics, Ultrafast Optics. Soft Condensed Matter and Biophysics. **Interdisciplinary:** Optical Spectronsocy under extreme conditions, High Pressure-High Temperature Physics, Energy Stroage and alternative Energy Materials, C02 sequestration, Mineral Physics.	M.Sc. in Physics / B.Tech. in Engineering Physics / M.Tech. in Applied Optics/ Solid State Materials/ Optoelectronics/Photonics.
DLTX01	Textile Technology	Mechanical Processing of Textiles, Textile Chemical Processing, Fiber Science and Technology, Technical Textiles, Textile Machine Design.	M.Tech or Equivalent degree in Textile Technology, Textile Chemistry, Fiber Science and Technology, Textile Engineering, Chemical or Mechanical Engineering, Civil/Electrical/Electronics/Biotech/Nano Tech., Polymer Science and Technology, Plastic and Rubber Technology, M.Sc. in Physics and Chemistry.

4. Indian Institute of Technology Guwahati, Guwahati 781039 –GW

Relaxation of SC/ST/PD candidates: Eligibility criteria will be relaxed by 5% in percent marks or 0.5 point in CPI in all cases.

Code	Department/ Centre	Fields of specialization	Minimum Qualification
GWBT01	Biotechnology	All areas of Biotechnology	M.Tech. degree or equivalent in an appropriate area with minimum CPI of 6.5 or 60% marks or MSc Degree in Bio Technology/ Life Science/ Agricultural Sciences/ Chemistry with minimum CPI 7.5/10 or 70% marks.
GWCH01	Chemical Engineering	All areas of Chemical Engineering	M.Tech. degree or equivalent in an appropriate area with minimum CPI of 6.5 or 60% marks.
GWCY01	Chemistry	Inorganic Chemistry, Organic Chemistry Physical Chemistry & Theoretical Chemistry.	Masters degree in the relevant discipline with minimum of CPI 6.5/10 of 60% marks.
GWCE01	Civil Engineering	Construction Management, Environmental Engineering, Geotechnical Engineering, Structural Engineering; Transportation Engineering and Water Resources Engineering. Water Resources Engineering and Management, Infrastructural Engineering and Management.	M.Tech. degree or equivalent in an appropriate area with minimum CPI of 6.5 or 60% marks.
GWCS01	Computer Science & Engineering	Algorithms; Computational Geometry; Systems Biology (Bio-computing); Bio-inspired Robotics and related algorithms; Mobile Agent Based Systems; Machine Learning; Speech Processing; Image Processing, Information Retrieval and Web Mining; Formal Verification; Embedded Systems, CAD for VLSI; Multi-processor Computer Architecture; Computer Security; Networks; Operating Systems; Distributed Systems; and Human-Computer Interactions.	M.Tech. degree or equivalent in an appropriate area with minimum CPI of 6.5 or 60% marks.
GWDE01	Design	Industrial Design, Product Design, Communication Design (Including art & visual Culture) Interaction and Usability engineering (Including HCL), Design Management , Ergonomics (Including Occupational health and safety), Environment Design, Animation.	M.Des/M.Arch or M.Tech/ME degree in relevant area with a minimum CPI 6.5/10 or 60% marks. Master's degree in Applied Arts / Ergonomics / Fine Arts/Psychology/Physiology with minimum CPI 6.5/10 or 55% may also be considered.
GWEE01	Electronics & Communication Engineering	All areas of Electrical, Electronics and Communication Engineering	M.Tech. degree or equivalent in an appropriate area with minimum CPI of 6.5/10 or 60%marks.
GWEN01	Energy	Screening and Genetic improvement of Bio-fuel crops, Glycerol, bioconversion and synthesis of alcoholic biofuels, Biodiesel from microalgae, oilseeds, Bioelectronics for bio-fuel cell, Bigas, Combustion and detonation, Energy efficiency in electric machine, Wind energy, Waste heat recovery, Biohydrogen, bioethanol, biobutanol and microbial fuel cell, Thermal energy storage and hydrogen storage , solar driven cooling system, porous medium combustion and hydrogen energy, Solar cells.	M.Tech. degree or equivalent in an appropriate area with minimum CPI of 6.5/10 or 60% marks, OR M.Sc. in Physics, Chemistry, Biotechnology, Environmental Science or in relevant field with minimum of CPI 6.5/10 of 60% marks.
GWEV01	Centre for Environment	Environmental Chemistry/Biotechnology/Economics/Engineering; Waste Water Treatment and Supply, CO2 Capture/storage; Environmental; Environmental; Atmospheric Chemistry; Air Quality monitoring; Environmental Hydraulics; Environmental Genomics; and Other emerging areas of environment with interdisciplinary application of science, technology, arts and humanities.	M.Tech. degree or equivalent in an appropriate area with minimum CPI of 6.5/10 or 60% marks, OR, M.Sc. in Physics, Chemistry Biotechnology, Environmental Science or in relevant field with minimum CPI of 6.5/10 or 60% marks.

Code	Department/ Centre	Fields of specialization	Minimum Qualification
GWHS01	Humanities and Social Sciences	All areas of Humanities and Social Science	Masters Degree in the relevant discipline with a minimum of 55% marks or equivalent.
GWMA01	Mathematics	Numerical Analysis, Fluid Dynamics, Probability and Statistics, Applied Stochastic Processes, Formal Languages and Automata Theory.	Masters degree in the relevant discipline with a first class or a minimum CPI 6.5/10 or 60% marks.
GWME01	Mechanical Engineering	Stress Analysis; Experimental and Computational Fracture Mechanics; Composite Materials and Structures; Smart Materials and Smart Structures; Materials Characterization; Dynamics and Controls; Electro-Mechanical Systems; Robotics; Nonlinear Vibration; Bio-Mechanics; Noise; Tribology; Condition Monitoring; Experimental Fluid Dynamics; Computational Fluid Dynamics (CFD); Bio-MEMS and Micro Fluidics, Heat Transfer; Low Speed and High Speed Acrodynamics; Multiphase Flow; Hydrogen Energy; Metal Hydride Based TGhermal Machines; Energy Storage and Fluidization; Bio-fuels; Metal Cutting; Micro Machining and Micro Fabrication; Unconventional Machining; Mechatronics; CAD/CAM/CAE; Materials Processing and Heat Treatment; Metal Forming; Welding; Bio-Nano Composites and Nanofluids.	M.Tech. degree or equivalent in an appropriate area with minimum CPI of 6.5 or 60% marks.
GWPH01	Physics	**Condensed Matter Physics** – biomaterials, cold atoms and quantum computation, computational materials physics, ferroelectric materials, organic semiconductors, semiconducting materials, smart magnetic materials, soft condensed matter physics, spintronics, statistical physics, strongly correlated systems, superconductivity topological insulators. **Laser and Photonics** – Applied Optics, Fiber Optics, Laser Matter Interaction, Nonlinear Optics, Quantum Optics. **High Energy Physics –** Collider Phenomenology, beyond the standard model and cosmological connections, B-Physics, CP violation, Neutrino physics. **Astrophysics –** Astrophysical flows, ultra high energy cosmic rays	Master's degree in the relevant discipline with a first class or a minimum CPI 6.5/10 or 60% marks.

5. Indian Institute of Technology Kanpur, Kanpur 208016 –KN

The basic qualification for admission to the Ph. D. programme is Master's degree in Engineering, Science, Humanities and Social Sciences respectively or allied area(s). However, the applicants with Bachelor's degree in Engineering may also be considered for admission based on their performance and attainments.

Code	Department	Fields of specialization	Minimum Qualification
KNAE01	Aerospace Engineering	**Aerodynamics:** Experimental Aerodynamics, High Speed Jets, Acoustics, Unsteady Aerodynamics * Flapping Wing, Transition & Turbulence, Hypersonic Aerodynamics, Microfludics, CFD/High performance Computing, Flow Control, Wind Energy & Design, Fluid Structure Interactions. **Flight Mechanics and Control:** Design & Control, Missile Guidance & Control, Flight Testing, Instrumentation & Parameter Esitimation, Unmanned & Autonomous Air Vehicle, Space Dynamics. **Propulsion:** Experimental & Computational Combustion, Emissions, Liquid Atomization, Turbomachinery, Intake Aerodynamics, Thrust Vectoring, Electric Propulsion. **Structures, Structural Dynamics & Aeroelasticity:** Material Characterization, Composite Materials and Smart Structures, Structural Dynamics and Stochastic Modeling, Aeroelasticity, Helicopter Theory (Dynamics & Aerodynamics), Structural Design & Optimization, Damage Modeling, Design and Dynamics of Autonomous Micro and Mini Air Vehicles, Wind Turbines.	Master's degree in: (1) Engineering (Aeronautical, Aerospace, Mechanical, Civil, Chemical, Naval Architecture Electronics). OR (2) Science with a minimum of 3 years of relevant R&D experience in Aerospace Engineering.
KNCH01	Chemical Engineering	Transport phenomena, Chemical Reaction Engineering, Applied Kinetics and Catalysis, Thermodynamics, Membrane Separation Processes, Process Systems Development, Computer Aided Design, Optimization and Control, Petroleum Engineering, Polymer Science and Engineering, Environmental Pollution and Control, Adsorption, Safety and Reliability, Dynamics of Nonlinear Systems, Colloids and Interface Engineering, CFD, Rheology, Non-Newtonian Fluid Mechanics, Nanotechnology, Numerical Methods for Engineers, Mathematical Methods in Chemical Engineering, Modeling and Simulation in Chemical Engineering, Bioinformatics, Modeling and Simulation of Separation Processes. Molecular Simulation.	First class Master's degree in Chemical Engineering or equivalent.
KNCY01	Chemistry	**Inorganic:** Bio-inorganic, Coordination Polymer, organometallic. Inorganic Materials. **Organic:** Supramolecular Chemistry, Bio-organic, Medicinal, Organic photochemistry, Organic synthesis and reaction mechanism, Organometallic. **Physical:** Bio-physical, Chemical kinetics, Magnetic resonance, Mass spectrometry, Physical photochemistry, Ultrafast spectroscopy. Functional materials.	High second class Master's degree in Chemistry or Physics; ***Note:*** *Candidates must* have *had Bachelor's degree with Chemistry and preferably Mathematics as one of the subjects.*
KNCE02	Civil Engineering (Code no. of the specialization to be indicated in the data sheet)	Environmental Engineering.	M.Tech./M.E. in Civil/ Environmental/ Chemical / Mechanical/ Metallurgical Engineering Or related engineering branch. Candidates with M.Sc. degree must have mathematics as one of the subjects at the 10+2 level.
KNCE03		Geoinformatics	M.Tech./ M.E. degree in Civil/ Mining/ Electrical/ Computer Science Engineering./Electronics Engineering./ Information Technology or M.Tech/ MSc. Degree in Earth Science streams/ Geography /Physics/ Mathematics/ Environmental Sciences. Candidates with M.Sc. degree must have mathematics as one of the subject at the B. Sc. level.
KNCE04		Geotechnical Engineering	M.Tech./ M.E. degree in Civil Engineering.
KNCE05		Hydraulics & Water Resources Engineering	M.Tech./ M.E. degree in Civil/ Aerospace/
KNCE06		Structural Engineering	M. Tech./M. E. degree in Civil Engineering. Candidates. with Master's degree in Architecture, Building Construction and allied subjects may also be considered.
KNCE07		Transportation Engineering	M. Tech./ M.E. degree in Civil Engineering.

Code	Department	Fields of specialization	Minimum Qualification
KNCS01	Computer Science & Engineering	**Algorithms**: Randomized, Graph Theoretic, Number Theoretic, Data Streaming algorithms, Algorithmic game theory. **Systems:** Computer Architecture, VLSI testing, Software Architecture, Internet Technologies, Distributed and Mobile Computing, Data bases, Program Analysis, Compilers and optimization. **Theory:** Complexity, Information Theoretic Complexity, Algebraic Computation, Computational arithmetic and Geometry, Quantum Computing, Computational Game Theory, Logic for CS. **Artificial Intelligence**: Machine Learning and Probabilistic Reasoning, NLP, Bioinformatics, Intelligent Tutoring, Game theory and Multi-agent Systems, Computer Vision.	First class Master's degree in Engineering Must possess adequate Computer Science background. (Note: Outstanding candidates)
KNEE01	Electrical Engineering	Microelectronics, VLSI and Display Technologies, Power Systems, Power Electronics, High Voltage Engg, RF Engineering and Photonics, Signal Processing, Communications and Networks, Control and Automation.	Master's degree in Electrical, Electronics or Communication Engineering Or equivalent.
KNHS01	Humanities and Social Sciences	**Economics:** Industrial Organization and Policy, Environmental Economics, Environmental Impact Assessment, Development Economics & Policy, Microeconomics, Inter-Industry Economics, Project Evaluation/BCA, Regional Economics, Macroeconomic Theory & Policy, Monetary Economics, Managerial Economics, Transport Economics, Law and Economics, Heath Economics. Econometrics, Game Theory, Political Economics, Mathematica Economics and Optimizational, International Economics. **English Literature:** American Literature, British Literature, Common wealth Literature, Ethnic Literatures, European Literature, Indian Writing in English, Literary Movements, Literary Theory, Teaching of Literature, Post Colonial Studies, Indian Literature, Translation Studies. **Linguistics: L**inguistic Theory, Cognitive Linguistics, Computational Linguistics, Communication studies, Sociolinguistics, Applied Linguistics and English Language Teaching, First and Second Language acquisition, Linguistic typology, Field Linguistics, Historical Linguistics. **Philosophy:** Twentieth Century Philosophy, Logic, Philosophy of Science Ethics, Philosophy of Language, Philosophy of Social Sciences, Indian Philosophy, Philosophy of Mind, Philosophy of Cognitive Sciences, Philosophical Aesthetics, Philosophy of Religion Ethics. **Psychology:** Social Cognition, Personality, Experimental Social Psychology, Organizational Behavior, Human Cognitive Processes, Consumer Psychology, Cross-cultural Psychology, Health Psychology and Neuropsychology, Cultural Issues in Psychology, Disaster Mental Health. **Sociology:** Sociology of Religion, Urban Sociology, Social Demography, Environmental Sociology, Sociology of Development, Science, Technology and Society, Social Movements, Third Sector Non-government and Voluntary development Organization, Human Rights, Social Gerontology, Sociology of Education and Disability Studies.	55% marks in Master's degree in the respective area with consistently good academic record.
KNIM01	Industrial and Management Engineering	Services Management, Management of Technology, Innovation and Entrepreneurship, Marketing Management, Manufacturing, Operations and Supply Chain, Quantitative Methods & Decision Making, Organizational Behavior, Human Resource Management, Business Economics, Infrastructure and Public Systems, Corporate Governance, Finance, Risk Management and Insurance, Financial Markets and Models, Enterprise Information and Knowledge Systems, Leadership, Ethics, Strategic Management, Business Policy, Energy Economics, Policy and Regulation etc. Intellectual Property Management, Insatiability, Project Management, Business Process Management, E- Governance, Information Systems, Change Management, Business Analysis.	The applicant must have a master's degree in management or relevant disciplines in engineering/ technology with marks/CPI not below the specified minimum. Applicants with a Bachelor's degree in engineering with a minimum of 75 percent marks/ 7.5 CPI, or master's degree in science/ arts/ commerce, satisfying each of the following criteria may also be considered. (a) a minimum of 65 percent marks/ 6.5 CPI in the master's degree, (b) first division in bachelor's degree, and (c) JRF/95 percentile or higher in GATE

Code	Department	Fields of specialization	Minimum Qualification
KNMA01	Mathematics/ Statistics	Algebraic coding theory, Biomathematics, Biomechanics, complex analysis, Fractals and Complex Dynamics, Differential and integral equations, Fluid mechanics, Functional analysis. Harmonic analysis, Nonlinear analysis, Numerical analysis, Stability theory, Tribology, Mathematical Modeling, Computational Fluid Dynamics, Non Linear Control Systems, Algebra, Multivariate analysis, Order statistics, Nonlinear regression, Signal processing, Ranking and selection procedures, Data analysis, Estimation theory, Decision theory, Time Series, Reliability, Optimisation and variational analysis, Logic, Parallel Computing, wavelets. Reliability Theory, Rough Set Theory, Differential Geometry, Fouvier Analysis, Econometrics	High second class Master's degree in Mathematics or Statistics, with at least 55% marks or equivalent.
KNME01	Mechanical Engineering	**Solid Mechanics:** Composite Materials, Fracture Mechanics, Multiscale simulation, Stress Waves, Non-Destructive Testing, Large Deformation Elasto-Plastic Analysis, Impact Contact Problems, Smart Structures-Materials and System, Microelectro-Mechanical Systems. Computer Aided Design, Kinematics and Dynamics of Machinery, Vibration, Friction and Wear, Lubrication, Rapid Prototyping, Rapid Tooling, Reverse Engineering, Compliant Mechanisms, granular media, crystal physics, noise & acoustics, Non Linear dynamics & Control. **Fluid Mechanics:** Active flow control, Turbulence Measurements, Wake Dynamics, Laser-based Techniques Computational Fluid Dynamics, Computerized Tomography, Transport in Hierarchical Porous Media, Holographic PIV. **Thermal Sciences:** Computational Heat Transfer, Heat Pipes, drop- wise Condensation, Gas Turbine Blade Cooling, Heat Exchangers, Turbomachinery, Emission from IC Engines, Biofuels, Hydrogen Technology and Fuel Cells. **Manufacturing Sciences:** Metal Cutting, Metal Forming, Machine Tools, Unconventional Machining, Computer Aided Manufacturing, Computer Integrated Manufacturing System, Netshape Manufacturing. Casting and Solidification, Nanotechnology. **Mechatronics:** Manipulators Dynamics, Task Structuring and Path Planning, Collision Avoidance and Navigation, Sensor Based Intelligent Robotics, Industrial Robotics.	First class or equivalent Master's Degree in Mechanical Engineering/ Master's degree in Production Engineering Is admissible for Manufacturing Science. ***Note:*** *In exceptional cases applicants with first class Master's degree in other branches of Engg. May also be considered.*
KNMS01	Materials Science (Interdisciplinary programme)	Electronic, Magnetic, Opto-electronic, Piezoelectric, Ferro-Electric Organic Semiconductor and Energy Storage/ Conversion Materials. Ceramic Processing, Structural Ceramics and Composites. Nanoscale Materials and Processes, Thin Films, Electron Microscopy, Display materials. Superionic/Fast-ion conductors, Solid electrolytes, High Density and Ni-Metal Hydride Batteries. Polymer processing and Rheology, High Performance Plastics, Polymer Blends-alloys & Composites. Optical Spectroscopy (Raman, IR, Photo luminescence), multiferroics.	M.E., M.Tech., M.Sc. (Engineering) Degree in Materials Science or any equivalent branch of engineering/ technology; or B.E., B.Tech., B.Sc. (Engineering) with a minimum of 75% marks or Cumulative Point Index (CPI) of 7.5/10 in any relevant branch of Engineering/ technology, or M.Sc. degree in an allied area with , Exceptional academic records.

Code	Department	Fields of specialization	Minimum Qualification
KNMT01	Materials Science and Engineering	Heat and Mass Transfer in Metallurgical System, Process Design and Development in Extractive Optimization, Electro-deposition, Physical Metallurgy, Alloy Development, Thermodynamics and Kinetics of Phase Transformations, Heat Treatment, Solidification of Metals and Alloys, Interfacial Processes, Mechanical Processing, Thermo mechanical Processing of Steels and Titanium Alloys, Processing-Structure-Property Relations in Materials, Intermetallics, Nanostructural Materials, Microstructural Characterization and Stereology, Electron Microscopy, Evolution and Characterization ofTextures During processing Environmental Degradation of Materials, Materials Hydrogen Interaction, Powder Metallurgical Processing, Modeling of P/M Processes, Solid State and Liquid Phase Sintering, Structural Ceramics Composite Materials, Metal Matrix Composites, Tribology of Advanced Materials, Welding Processes, Magnetic Materials, Electromagnetic Materials and Processing, Thin Film Technology, Characterization and Applications of Opto-Electronic Materials and Devices, Materials Processing by Solid State Chemistry, Ferroelectric Ceramics, Electronic Materials, White Light Illumination, Display Materials and Technologies, Bio-materials. Multiferroic Materials & Thin films, Photovoltaic and energy materials & devices.	B. E./B. Tech. degree and a M.E./M .Tech degree in Metallurgical or Materials Engineering, Materials Science, Ceramic Engineering, Nanoscience, Nanotechnology, Mechanical, Electronics. Minimum 60% marks or a CPI of 6.0/10 in B.E./ B/ Tech. & Minimum 70% marks or a CPI of 7.0/10 in M.E./M.Tech. **OR** M .Sc. and M. E./ M.Tech. degree in Metallurgical or Materials Engineering, Materials Science, Ceramic Engineering, Nanoscience, Nanotechnology, Mechanical, Electronics. Minimum 60% marks or a CPI of 6.0/10 in B.Sc. and M. Sc. & Minimum 70% marks or a CPI of 7.0/10 in M.E./M.Tech.
KNNE01	Nuclear Engineering & Technology	Nonlinear Dynamics and Control, Bifurcation Theory, Transport and Kinetic Theory, Fusion Plasma Simulation, Reactor Safety, Numerical Methods, Radiation Measurements and Nuclear Instrumentation, Reactor Analysis and Design, Radioisotope Applications, Waste Disposal, Non Invasive Imaging, NDT, Computed Tomography.	First class Master's degree in any branch of Engg., preferably with some knowledge in Nuclear Engineering or equivalent.
KNPH01	Physics	Atomic and Molecular Physics, Astrophysics , Biological and Statistical Physics , Biological and Statistical Physics, Biophotonics, Computational Physics, Condensed Matter Physics, Cosmology, Dynamical Systems and Turbulence, Fiber optics, Ion Beams and Nuclear Physics Techniques, Laser Cooling and Trapping, Light-Matter Interaction, Nonlinear Optics, Particle Physics, Photonics of Micro and Nano Structured Materials, Plasma Physics and Laser Plasma Interaction, QCD and Lattice Gauge Theories, Quantum Phase Transition, Quantum Field Theory, String Theory and Quantum Gravity, AdS/CFT, Hydrodynamics, Quantum Optics, Quantum Computing and Information, with a substantial of Inter-Disciplinary activity.	First class Master's degree in Physics or first class Master's degree in a related subject or first class Bachelor's degree in Engg.
KNLS01	Photonics Science & Engineering	Laser Spectroscopy, Optical communication, Laser Material Processing, Quantum Optics, Biophotonics, Opptofluidics, optical imaging (Tomography), LIDAR, Interferometry, Holography etc, Photonics integration (Semiconductor device & Lasers).	Degree in any branch of Engg. and Science with exposure in Photonics.

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In all cases the minimum qualification for admission is a Master's degree in Engineering/Technology or its equivalent with minimum 60% marks or Master's degree in Sciences, Humanities or Social Sciences with minimum of 55 % marks (or equivalent grade point average).

Code	Department	Fields of specialization	
KHAE01	Aerospace Engineering	Fluid dynamics and Aerodynamics, Computational fluid dynamics, Experimental methods, Aircraft structures, Composite structures and Smart structures, Structural dynamics and aeroelasticity, Aircraft propulsion, Thermal sciences and Engineering, Combustion, Flight mechanics and control.	
KHAG01	Agricultural and Food Engineering	**Farm machinery and power**: Ergonomics, Biofuels, Soil dynamics in tillage and traction. **Land and Water Resources Engineering:** Watershed Modeling and Management, Irrigation Systems Management; Groundwater Modeling; Rainwater Harvesting, Flood Modeling, Non-point Source Pollution, Climate Change, Green House Technology. **Food Process Engineering:** Dairy and Food Engineering, Food Processing and Preservation; Food Science and Technology, Mechanized Processing of Food, Physical and Thermal Properties of Food; Preservation and Packing of Fruits and Vegetables. **Agricultural Biotechnology**: Microbial and Enzyme Technology; Plant Tissue Culture, Algal Biotechnology, Biotechnology of Medicinal and Aromatic Plants. **Agronomy**: Climate Change Impact Assessment on Crop Yields, Organic Farming, Tea Cultivation and Processing. **Soil Science:** Water and Nutrient Management, Soil Physics. **Aquacultural Engineering:** Waste Utilization and Agro Environmental Technology, Aerators, Cage Aquaculture, Fish Processing Technology, Biofloc Technology.	
KHAR01	Architecture and Regional Planning	Universal Design, Building Automation and Management Systems, Building Materials and Composites, Urban design, City Planning, Computer Applications in Architecture and Planning, Disaster Responsive design and planning, Green Architecture, Energy Efficient and Cost-effective Building Technology, GIS and Remote Sensing, Heritage studies and Conservation, Housing and Community Planning, Infrastructure Planning and Systems Management, Metropolitan Planning, Recreation and Tourism Planning, Regional Planning, Spatio-environmental Planning and Design, Transportation Planning and Traffic Engineering, Urban Development Management, Urban Open Space, Water Sensitive Planning.	
KHBT01	Biotechnology	Bioinformatics, Tissue Engineering, Bioreactor /bioprocess development, Enzyme Technology, Plant biotechnology, Down stream processing, Genetics, Environmental biotechnology, Cell/molecular biology, Biochemistry, r-DNA Technology, Structural Biology.	*Minimum Qualification* Minimum 60% of marks (or equivalent Grade point average) is required in case of M.Sc./M.Tech. degree.
KHET01	Center for Educational Technology	Image Processing, Speech Processing, Data Communication, E-learning, Instructional Design, Distance Education, Evaluation and Assessment. Natural Language Processing.	
KHCH01	Chemical Engineering	Transport Operations, Membranes and other Separation Processes, Reaction Engineering, Particulate Technology, Process Dynamics & Control, Fuel and Mineral Processing, Petroleum Refining & Petrochemicals, Industrial Pollution Control, Modeling & Simulation of Chemical Processes, Green Process Technology, Micro-Scale Heat Exchange & other processes, Advanced Materials Engineering using Plasma, Polymer Engineering etc.	
KHCY01	Chemistry	DNA Interacting Molecules, Enzyme Inhibitors, Bio-mimetic, Bio-Inorganic Chemistry, Protein Chemistry, Synthetic Organic Chemistry, Surface Chemistry & Catalysis, Nano Crystalline semi conducting magnetic metal chalcogenides and magnetic ferrites, Biologically Active Compounds: Stereo selective Synthesis, Isolation and characterization of bioactive materials, Macromolecules, Colloids and Drug Delivery, Environmental Chemistry, Energy from non-conventional sources, Aromaticity in metal clusters, Nanoparticle Catalysis, Nano Technology, Solid State Chemistry, Supra- molecular Chemistry, Transition metal chemistry, Self-assembly and metallahelicates in coordination chemistry, Organometallic Chemistry, Homogeneous Polymer Anchored Catalysis, Photochemistry & Photophysics in Organized Assemblies, Carbohydrates and Nucleosides Biological Dual Perspectives, Enantiomeric Separation Using Capillary Electrophoresis, Density Functional Theory: Quantum Chaos, Chemical Reaction Dynamics in Liquids and Biological Systems, Computer Simulations of Complex Systems with Applications in Biology and Materials Science, Electrocatalysis, Electrochemical Biosensors, Chemical Reactivity, Quantum toxicology.	
KHCE01	Civil Engineering	Structural Engineering, Hydraulic and Water Resources Engineering, Geotechnical Engineering, Transportation Engineering, Environmental Engineering and management.	
KHCS01	Computer Science and Engineering	Artificial Intelligence, Speech and Language Processing, Software Reliability, Data-base systems, VLSI System Design, Embedded Systems, Fault Tolerant Computing, Distributed Systems, Computer Networks, Image Processing and Computer Vision, Computational Geometry, Theoretical Computer Science, Bioinformatics, Assistive Technology, Formal Verification, Cryptography and Network Security.	
KHCR01	Cryogenic Engineering	Production, Storage and Utilization of Industrial Gases, Air Separation, Mass Transfer and Separation Processes, Natural Gas Processing and Liquefaction. Hydrogen Energy, Low Temperature Adsorption of Gases, Gas Hydrates, Computer Aided Design of Cryogenic Process Plants, Closed Cycle Cryocoolers, Low Temperature Heat Exchangers, Expansion Machines, Heat Transfer, Cryogenic Rocket Propulsion, Air Breathing Propulsion, Magnetic Refrigeration Materials, Nanofluids, Spintronics, Superconducting Magnets and Applications, Thermo Physical Properties of Nanoscale Materials, Cryobiology, Magnetic Sensors, Vacuum Technology and Process Applications. Helium Liquefaction and Refrigeration, Oxygen Safety, Superconducting Magnetic Energy Storage, Cryogenic/Superconducting/Vacuum aspects for nuclear fusion and Power Applications.	

Code	Department	Fields of specialization	
KHEE01	Electrical Engineering	**1. Machine Drives and Power Electronics:** Control of drives, Switched mode and resonant mode power supplies, Power Converters, Medium voltage converter topology and drives, Digital control of SMPS, Energy Efficient drives, Electro-magnetic Levitation, Variable Speed Constant Frequency Generation Systems, Automated Electrical Vehicles, Non-linear Phenomena in Power Electronics, Bifurcation and Chaos in Hybrid Dynamical Systems. **2. Control System Engineering:** System identification and modeling, Fault detection, diagnosis and control, Learning control, Nonlinear control, Robust control, Intelligent control, System Theory, Large-scale systems, Reduced order modeling, Fuzzy control, Periodic controllers, Attitude and orbit control of launch vehicles and satellites, Embedded Systems Fractional-order systems and control, Control Allocation. **3. Power & Energy Systems:** Power Systems Analysis, Dynamics, Modeling and Control, Power System Stability, Protection, Real-time Simulation, High Voltage Engineering, Photovoltaic, Wind Energy, Energy modeling and Management, Insulation Engineering, Condition monitoring of power apparatus, Digital relaying, Power Quality, Electrical Power distribution systems, Power System deregulation, FACTS design including devices, Distributed generation, Microgrid. **4. Instrumentation and Signal Processing:** Instrumentation and signal Processing: Sensor development MEMS and Mixed signal VLSI design and validation , Magnetic sensing, Medical instrumentation and imaging, Embeded systems, Signal/Image processing, Machine learning.	
KHEC01	Electronics and Electrical Communication Engineering	◆ Device modeling, Technology CAD, Silicon heterosructures, Compound semiconductor electronic and optical devices, MEMS and Nanotechnology, Mixed signal design, Low voltage low power circuit design, Low power RF IC design, Design of VLS based signal processing chips, SOC base embedded system for biomedical instrumentation, VLSI Testing, Fault diagnosis, Design Automation of Analog VLSI circuits, Circuits for high speed wired link, On-chip power management. ◆ Antennas, Planar and Waveguide Circuits, RFICs; RF MEMS; Metamaterials; RF- VLSI Interconnects; EMI, EMC, EMP, Radar cross section, Microwave Imaging; Channel Modeling for Wireless Communication. ◆ Image and Video Coding, Computer Vision, Video Surveillance, Medical Image processing Multimedia, Database, Multimedia Network, Parallel and distributed Processing, Audio coding, Computer architecture, embedded systems.Network-on-Chip. ◆ Computer Networks, Wireless Communications and Networking, Wireless Internet, Multiuser Receiver, Multiband OFDM, Channel Coding, Link Adaptation Techniques, MIMO Systems, Capacity Mobile Adhoc Networks, Wireless Sensor Networks, Optical Communications and Networking, WDM Transmission, Fiber Nonlinearities, Wavelength routed Networks, Passive Optical Networks, Optical Burst Switching, Cognitive Radio, 4G Cellular, Fiber Optics, Fiber Optic Sensors, Fiber Optic amplifiers and Lasers, Plasmonics, Photonic Crystal Fibers and Waveguides. ◆ Architectural Optimization, Adaptive Filters, Wavelets and Multirate-DSP, DSP Application in Wireless Communication, Biomedical Signature Analysis, Voice Signature Analysis, Detection and Estimation, Modeling of Signals and Systems	
KHGG01	Geology and Geophysics	Igneous and Metamorphic Petrology, Ore Petrology, Geochemistry and Mineralogy, Isotope Geology, Precambrian Geology and Tectonics, Structural Geology, Microtectonics, Stratigraphy and Sedimentary Geology, Basin Analysis, Applied Micropaleontology, Paleoceanography and Paleoclimatology, Coastal and Quaternary Geology, Mineral Exploration and Resource Potential Mapping, Hydrogeology, Groundwater Contamination, Remote Sensing and GIS, Environmental Geochemistry of water, soil and air-their contamination by natural and anthropogenic factors, Landslide Hazards,Gravity, Magnetic and Electrical Fields Electrical Fields (including modeling and numerical analysis), Seismic and Electromagnetic wave Propagation (including modeling and numerical analysis), Nuclear Geology and Geophysics, Geophysical Exploration of minerals, ground water and hydrocarbons, Airborne Electromagnetics & Exploration of Deep Seated Uranium Ores, Earthquake Hazard Assessment and Seismic Microzonation, Geotomography, Pattern Recognition in Geophysics, Strong Motion Seismometry, Computational Geophysics,	
KHGT01	G. S. Sanyal School of Telecommunication	Digital Communication, Mobile Communications, Information Theory and Capacity Analysis. Error Control Coding, Digital Signal Processing, Optical Communications, Tele Communication Networks, Multimedia Communications, Detection and Estimation Theory, RF and Digital Design for Telecommunication, Cognitive Radio	
KHHS01	Humanities and Social Sciences	English Language and literature, American Literature, Afro-American Literature, Comparative Literature, Post-colonial Literature, Indian Literature, Dalit Literature, Indian Aesthetics, Media Culture, Culture Studies, Communication Studies, Econometrics and Applied Economics, Economic Planning and Policies, Managerial Economics, Organizational and Development Economics, Agricultural Economics, Manpower Planning. Human Resource Development and Management, Organizational and Social Psychology, Interpersonal Communications, Clinical Psychology and Neuropsychology. Philosophy of Mind, Logic, Applied Ethics. Rural and Urban Sociology, Sociology of Development and Sociology of Health.	
KHIM01	Industrial Engineering and Management	Operations Research, MIS, Facilities Planning and Design, Quality Engineering and Management, Production-Inventory Systems, Logistics and Supply Chain Management, Ergonomics and Human Factors Engineering, Safety and Risk Analysis, New Product Development, Intelligent DSS, Small World Networks, Software Project Management, Production Design, Lean/Agile Manufacturing, System Dynamics and E-Business.	*Minimum Qualification* :Master's degree in Engineering/ Technology MBA with graduation in Engineering/Technology or equivalent with minimum of 60% marks (or equivalent grade point average)

Code	Department	Fields of specialization	
KHMS01	Materials Science	Polymer nano-composites, Polymer Synthesis, Characterization and Application, Semiconductor Materials; Crystal Growth, Opto-electronic Materials, Semiconductor, Wide Band Gap Semiconductors, Synthesis and Processing of Glass and Ceramics, Nano-ceramics and Nanocomposites, Thin and thick Film Ceramic coatings, Magnetic Ceramics, Solid Oxide Fuels, Near net Shape Forming of Ceramic Components, Electronic ceramics, New materials, Chemical and Biological Sensors, Electronic Polymers, Lithium ion Batteries, Magnetic Materials, Organic Semi-conductors, MOCVD growth of III-V Semiconductors. Ferroelectric Thin Films, Nanofluids, Nanopastes/glues.	*Minimum Qualification :* B.Tech/B.E Degree in Chemical Engineering/ Technology, Ceramic and glass Technology,Materials Technology, Plastic and/or Rubber Technology, Polymer Science and Technology / Biotechnology With 60% marks minimum. M.Sc. in Physics, Solid State Physics, Chemistry, Material Science, Polymer Chemistry, Electronic Science. With 60% marks minimum
KHMA01	Mathematics	Fluid Mechanics, Numerical Analysis, Statistics, Operation Research, Computer Science, Functional Analysis, Complex Analysis, Computational Fluid Dynamics, Algebra, Fuzzy Mathematics, Artificial Intelligence, Data Base Management Systems. Cryptography, Graph Theory	
KHME01	Mechanical Engineering	Fluid machanics.CFD, Hydrodynamic stability, Multiphase flow, Numerical heat transfer, Experimental heat transfer and fluid flow, Liquid fuel atomization, and Spray combustion, I.C Engines, Fluidised bed combustion, Refrigeration and air conditioning, Transcritical CO_2 and natural refrigerant based heat pumps, Thermal systems modeling and optimization, Solar energy, Optical diagnostics of thermo-fluid systems, Thermal hydraulics of nuclear plants, Microfluidics and Micro- scale transport processes. Casting, Welding and Metal forming, Maching and grinding, Machine tools, Cutting tools and coating, Tool condition monitoring, Plasma-spray ceramic coating, Electrophysical machining process, Precision manufacturing and laser processing, Computer aided design and manufacturing, Computer Aided Process Planning, Rapid Prototyping, Intelligent Machines and Systems, Numerical Modeling of Manufacturing Process. Systems, Modeling and design using Bond Graphs, Modeling and control of Microsystems, MEMS, Automotive Engineering, Noise Vibration Control, Signal Processing in Mechanical Systems. Finite Element Method and Boundary Element Method, Computational solid mechanics, Non-linear Mechanics, Fracture mechanics, Composite materials, Smart materials and Structures, Biomechanics, Industrial, bio- and nano- Tribology, Surface Engineering, Mechanical Systems Dynamics, Rotor Dynamics, Vehicle Dynamics ,Bifurcation and Chaos, Condition monitoring and Fault tolerant control, Mechanical handling systems and Industrial automation, Industrial fluid power and control.	
KHMT01	Metallurgical and Materials Engineering	Physical Metallurgy, Extractive Metallurgy and Mineral Processing, Steel Technology, Process Modeling, Corrosion Science and Technology, Mechanical Metallurgy, Structural Integrity, Casting and Solidification, Powder Metallurgy, Welding Metallurgy, Computational Material Science and Technology, Nanostructured Materials, Bulk Metallic Glasses, Biomaterials, Electronic and Magnetic Materials, Functionally graded Materials, Intermetallics, Composites. Tribology and Surface Engineering, Thin films and coatings.	
KHMN01	Mining Engineering	Experimental and computational geomechanics, Geostatistics, GIS and Remote Sensing: Subsurface and surface environment (heat, air, water and soil), Fly ash characterization and utilization, Occupational health and safety, Mining systems and management, Material- Rock Interaction, Mineral Quality Control, Environmental Impact Assessment and Management, Waste Remediation, Mining Machinery & Bulk material Handling, clean coal technology; coalbed methane and Shale gas; Mineral processing. Blasting and ground vibrations. **B.Tech/BE/** in Mining Engineering, Petroleum Engineering, Chemical Engineering, Mining Machinery and Mineral Processing, **M.Sc** in Physics, Applied Geology, Mathematics and Geo-Informatics, **M.Tech.**in Chemistry, Geo-Informatics and Geo-Physics.	
KHOE01	Ocean Engineering and Naval Architecture	Marine Hydrodynamics, Marine & Ocean Structures, Ocean Engineering Materials, Fluid – Structure Interaction, Marine Design, Marine Production and welding, Ocean Engineering, Coastal Engineering, Water Wave Mechanics, Physical and Dynamical Oceanography, Ocean Wave Modeling, CFD. Numerical Simulation and Analysis of Ocean Structure.	
KHPH01	Physics and Meteorology	Astrophysics & Cosmology, Condensed Matter Physics, Ferroelectrics & Dielectrics, Fiber Optics, Magnetism, Multiferroics, Nanoscience & Nanotechnology, Nonlinear Optics, Nonlinear Instability, Nuclear Physics, Quantum Mechanics & Field Theory, Radiation Measurements, Semiconductor Devices, Solid State Ionics, Thin Films, Renewable Energy Sources.	

Code	Department	Fields of specialization	
KHRT01	Rubber Technology	Polymer blend & alloys, Composites, Polymer and Rubber Processing, Product Development, Polymerization, Development of Novel Polymers, Structure-Property Correlation, Waste Polymer Recycling, Thermoplastic Elastomer, Adhesion and Surface Treatment, Nanocomposites, Polymer Rheology, Smart Polymers. Rubber Composities and Compounding.	*Minimum Qualification* :Master's degree in Science/ Engineering/ Technology or its equivalent with minimum 60% marks.
KHRD01	Rural Development	Transfer of technology; Socio-economic aspects of Rural Development, Planning and development models, Crop, water and land use planning; Information Technology in Rural Development, Tribal Development, Upgradation of technology.	
KHRE01	Reliability Engineering	System Reliability assessment, Reliability and design, Reliability simulation, Machinery Fault Diagnosis, Maintenance Engineering & Management, Risk and Safety Assessment, Software reliability.	*Minimum Qualification :* Minimum 60% marks (or equivalent Grade point average) in Electrical, Electronics, Civil, Computer Science, Mechanical and allied branches of the above.
KHIT01	School of Information Technology	Computer Security, Computer Vision, Image Processing, Pattern Recognition, Data Minining, Distributed Systems, E-Commerce, E-Learning, Geographical Information Systems, Human Computer Interaction, Information and Database Systems, Internet Technologies, Mobile Computing, Multimedia Systems, Software Engineering, VLSI Design, Speech Processing. Wireless adhoc networks, Wireless Sensor network, Vehicular abhoc networks	*Minimum Qualification:* M.E/M.Tech.in Information Technology or Computer Science & Engineering or Electronics & Communication Engineering
KHID01	Ranbir and Chitra Gupta School of Infrastructure Design and Management	"Project Engineering and Management; Financing Infrastructure Projects; Quantitative Methods for Decision Making; Simulation Laboratory; Environmental Impact Assessment; Infrastructure Regulatory Issues; Virtual Reality Lab.; Transportation : Urban Transportation Systems Analysis, Evaluation and Planning; Airport Planning; Bridges and Tunnels Engineering; Analysis and Design of Pavements, Traffic Engineering; Highway Construction Practice and Planning; Sea and Inland Port Infrastructure; Water Supply Systems; Waste Water Management; Solid Waste Management; Air Quality Management; Environment Sanitation; Hazardous Waste Management; Housing and Community Planning; Facility Programming & Specialized Building Design; Building Management Systems; Regional Infrastructure Development; Remote Sensing and GIS; Thermal, Hydel and Nuclear Power Generation; Power Infrastructure: Generation, Transmission and Distribution; Internal Combustion Engine; Power Transmission Systems; Non-conventional Energy Systems; High Voltage and Insulation Engineering; Power Infrastructure: Economics, Management, and Environment; Power System Planning and Reliability; Air-conditioning and Ventilation; Power Systems Transients and Protection."	
	VGSOM	According, Finance, Business Economics, Strategy, Technology Management, Operations management, Organizational Behavior, Human Resource Management, Marketing, Business Communication. **Eligibility**: MBA with a Postgraduate Degree/M.Tech/A Post Graduate Degree.	

7. Indian Institute of Technology Madras, Chennai 600036 –MD

The minimum educational qualifications for admission to the Ph.D. programme of the Institute are as follows:

- **Ph.D. in Engineering:** Candidates with a Master's degree in Engineering/Technology with a good academic record or a Master's degree by Research in Engineering/Technology with a good academic record. Candidates with Master's degree in Sciences with a good academic record and of exceptional merit where eligible, for the relevant Engineering discipline.
- **Ph.D. in Sciences:** Master's degree in Sciences with a good academic record. Master's degree in Engineering/Technology where eligible with a good academic record.
- **Ph.D. in Humanities and Social Sciences:** Master's degree in an eligible discipline with a good academic record.
- **Ph.D. in Management:** Master's degree in an eligible discipline with a good academic record.

Code	Department	Fields of specialization	Minimum Qualification
MDAE01	Aerospace Engineering	**Aerodynamics**: Helicopter Aerodynamics, Geo-Physical Fluid Dynamics, Subsonic, Transonic, Supersonic, Hypersonic,Rarefied Gas flows (Theoretical and Experimental), Boundary Layers and Stability of Flows, Turbulent Flows, Shock Tubes and Related Problems, Development of Algorithms and Code for Numerical Methods in Gas Dynamics and Computational Fluid Dynamics, Vortex Dynamics, Supersonic Mixing and Combustion, Optical Flow Diagnostics, Linear and Nonlinear Acoustics. **Aircraft Structures**: Finite Element Methods, Numerical Methods, Photo Elasticity, Moire and Holographic Methods of Structural Analysis. Composite Structures, Fatigue and Fracture Mechanics, Contact Mechanics, Vibration and Impact Mechanics. **Aerospace Propulsion**: Rocket Propulsion and Solid Propellant Combustion, Airbreathing Propulsion and Combustion, Cascade Flows, Multiphase Flow Simulation, Combustion Instability, Optical Flow/Combustion Diagnostics. **"Dynamics & Control:** Non-Linear Dynamics in Aerospace Applications, Computational Methods in Nonlinear Dynamics, Nonlinear Control Theory and Applications, Flight Simulations and Controller Development, Design Development of Autonomous Flying Vehicles."	Master's degree or its equivalent in Aerospace /Civil / Applied Mechanics/Mechanical/ Chemical or Master's degree in Mathematics/Physics and aptitude for research. Science Post- graduates should have exceptional merit and research or industrial experience in the appropriate field. Candidates with Master's degree in other allied engineering specializations can also be considered provided they have either basic degree in Aerospace Engineering or atleast five years experience in Aerospace industry / Research Organisation.
MDAM01	Applied Mechanics	**Biomedical Engineering :**Cardiovascular System studies, image and Signal Processing, Speech Signal Processing, Ultrasound and Laser instrumentation in Medicine, Biomechanics, Rehabilitation Engineering, Evoked Response and Functional Electrical Stimulation, Physiological Modeling, Biomaterials, Biosensors, Medical Diagnostics. **Fluid Mechanics:-**Laser Diagnostics, Turbulent Convection, Computational Fluid Dynamics (CFD), Bluff body and Industrial Aerodynamics, Fluid Structure Interaction, Experimental Fluid Mechanics, Sprays and multiphase flows. **Solid Mechanics:** Computational and Experimental studies in fatigue, fracture, smart materials, photo elasticity, plasticity, vibrations, control, composites, biomechanics, constitutive modeling and stochastic mechanics.	**Biomedical Engineering area:** Master's degree in Applied Mechanics / Civil / ECE /Mechanical/Electrical/ Biomedical Engineering/ Computer Science/ Instrumentation/ Metallurgical Engineering. **Fluid Mechanics area:** Master's degree in Applied Mechanics / Civil / Mechanical / Aerospace / Chemical / Biomedical Engineering/ Engineering Mechanics **Solid Mechanics area:** Master's degree in Civil/ Aerospace/ Mechanical/ Naval Architecture, Production Engineering with an aptitude for research in Solid Mechanics
MDBT01	Biotechnology	The research foci of our Department are (a) Medical Biotechnology, especially cardiovascular aspects and (b) Bioprocesses. Our faculty are working in various fundamental and applied aspects which include. Cellular, Molecular and Structural Biology related to Signal Transduction, Ion Channels, Lipid Trafficking, Stem Cell Proliferation/Culture, Cell Stresses, Cancer, Cell Death, etc.; Molecular Genetics of Plant Development. Proteinstructure prediction, Structure-function relationship. Molecular Modeling; Protein-ligand Docking; Computational Neuroscience; Signal Processing; Neural Networks; Character Recognition; Bioinformatics. Drug design, QSAR; siRNA Delivery. Bio-catalysis; Enzymes in Organic (asymmetric) Synthesis; Biosensors. Biotransformation; Molecular Bioremediation; Biodegradation; Green Chemistry. Bioreactor Design and Analysis; Simulation and Control of Bioprocesses; Reactive Oxygen species in Bioreactors; Liquid Phase Oxygen-supply Strategy; Metabolic Engineering; Cloning of Therapeutic Proteins; Ethanol from Biomass; Plant tissue and Animal cell Culture; Downstream Processing; Scale-up; Biomaterials; Biomechanics; Biomedical Devices and Implants	**Same as for our regular Ph.D program**

Code	Department	Fields of speciazation	Minimum Qualification
MDCH01	Chemical Engineering	Transport and Reaction Engineering, Systems and Control, Biochemical Engineering, Environmental Engineering, Materials and processes	Master's degree in Chemical Engineering
MDCY01	Chemistry	Analytical Chemistry, Bioinorganic Chemistry, Chemistry of Main Group Elements, Inorganic Heterocycles, Material Science, Synthetic and Structural Solid State Chemistry, Nanomaterials; Cage and Cluster Chemistry; Transition Metal Organometallics. Organic Synthesis, Natural products, Organometallics, Asymmetric Catalysis, Synthetic and Structural Carbohydrate Chemistry, Bioorganic Chemistry, Enzymes in Organic Synthesis; Homogeneous and Heterogeneous Catalysis, Surface Chemistry, Theoretical and Experimental Electrochemistry, Photochemistry, Polymer Chemistry and its Applications, Gas-phase Chemistry, Monolayers and Clusters; Green Chemistry. Organic Materials. Chemical Physics, Quantum and Theoretical Chemistry, Chemical Reaction Dynamics, Theoretical and Experimental Spectroscopy, Magnetic Resonance Spectroscopy and Imaging (especially NMR based), Fluorescence Spectroscopy, Nuclear Spectroscopy.	Master's degree in Chemistry. (General ,Applied, Analytical, Inorganic, Physical, Organic and Bio) M.Sc. in Physics or M.Tech degree holders with adequate background in Chemistry will also be considered.
MDCE01	Civil Engineering	Building Technology & Construction Management	Master's degree in Civil, Ocean or Industrial Engg., Industrial Management or MBA after obtaining a basic degree in Civil Engineering, or in Architecture, Housing, Town & Country planning after obtaining a basic degree in Civil Engg., or Architecture with first Class.
MDCE02		Environmental and Water Resources Engineering	M.Tech or M.S. or equivalent degree in Engineering Mechanics/ Aerospace Engineering/ Agricultural Engineering / Civil Engineering / Environmental Engineering Or M. Tech or M.S. or equivalent degree in / Chemical Engineering / Biotechnology / Applied Geology.
MDCE03		Geotechnical Engineering	Master's degree in Civil or Ocean Engg. Or Engg. Mechanics, Mining Engineers. With two years experience.
MDCE04		Structural Engineering	Master's degree in Civil, Ocean, Aerospace, Naval Architecture, Mechanical, Computer Science or in Engineering Mechanics with basic degree in Civil Engineering or Infrastructural Civil Engineering.
MDCE05		Transportation Engineering	Master's degree in Civil/Architecture/ Town and Country Planning/Regional Planning/City Planning/Urban Engineering or 2 years full time Postgraduate Diploma in Town and Country Planning with specialization in Traffic and Transportation Planning of the School of Planning and Architecture, New Delhi / MBA after obtaining a basic degree in Civil Engineering
MDCS01	Computer Science & Engineering	Theoretical Computer Science, Analysis of algorithms, Graph theory, , Cryptography. Software Engineering, Object Oriented Systems, Parallel and Distributed systems, Mobile Computing, Programming languages, Performance evaluation Software for VLSI design, Computer architecture, Computer graphics and Visualization. Computer Communication and networks, Network Protocols and security, Real- time systems, Wireless Sensor Networks Data bases, Knowledge based systems, Data mining, Artificial intelligence, Machine learning, Indian language systems, Speech and vision systems, Artificial neural networks, compilers.	Master's degree in Engineering /Technology Preference will be given to those with M.Tech/M.S degree in Computer Science & Engineering.
MDEE01	Electrical Engineering	Communication Systems including Fibre Optics, Computer Networking, Image and Signal Processing, Wireless Communication, Microwave, VLSI Design, Instrumentation, Power Systems, Machines, Control, Microelectronics, MEMS, Organic Electronics Power Electronics, Biomedical Devices.	Master's degree in Electrical or Electronics and Communication Engineering, instrumentation Engineering or Master's degree in Physics followed by a Master's degree in Engineering in an area of relevance to the area of research.

Code	Department	Fields of speciazation	Minimum Qualification
MDER01	Engineering Design	**Automotive Engineering**: Vehicle Dynamics, Tyre Mechanics, Mathematical Modelling of Dynamic Systems, Control, Fault Diagnosis, Automotive Systems, Intelligent Transportation Systems **Biomedical Design**: Medical Imaging, Biomechanical Modeling, Soft Tissue Mechanics, Bio-fluid Mechanics, Prosthetic and Scaffold Design, Biomedical Devices and Control, Microwave Applications, Tissue Ablation and Hyperthermia Physics, Radiometry, Ergonomics, Rehabilitation Engineering **Materials and Design:** Geometric and Solid Modeling, Computational Geometry, Shape Search, Shape Optimization, Image Based Reconstruction, Solid Free Form Fabrication, Design Theory, Reliability, Fatigue and Fracture, Finite Element Analysis, Sustainable Manufacturing **Robotics and Mechatronics**: Parallel Manipulators, Underwater Robots, Path Planning, System Dynamics and Control, Opto-mechatronics, Sensing.	Master's degree in Aerospace, Automobile, Biomedical, Civil, Computer Science, Electrical, Electronics, Engineering Physics, Instrumentation, Mechanical, Metallurgical, Material Science, Naval Architecture, Production / Manufacturing Engineering, or Master's degree in Design (Engineering) (M.Des.) or M.Tech. (Industrial Mathematics).
MDHS01	Humanities & Social Science	British, American, Common Wealth and New Literatures in English;Applied and Theoretical Linguistics; Philosophy of Language and Continental Philosophy; English Language Teaching (ELT); German Studies; European Studies; Political Philosophy; Modern Indian History; Applied Economics and Sociology; Science and Technology Policy Studies; Environment and Natural Resources Policy; Health care Policy; Urban Studies	Master's degree in relevant discipline
MDMS01	Management Studies	Technology Management, Knowledge Management, Financial Management, Human Resource Management, Organizational Behaviour,Marketing Management, Operations Management Supply Chain Management, Project Management, Information Systems & Management, Integrative Methodologies and Practices, Industrial Engineering.	60% and above for UG and PG in Social Sciences and Arts;/70% for UG and PG in Engineering and Management (BE/B.Tech./M.E./M.Tech./MBA); [60% for AMIE and other Associate ships.] [SC/ST candidates will be given 5% relaxation from the above]
MDMA01	Mathematics	Detailed information about the specialization of each faculty member is available in the Department web site.Mat.iitm.ac.in ALGEBRA: Commutative Algebra, Algebraic Combinatorics, Geometry and Topology of toric Varieties,Group Theory, Dynamical Systems, Fuzzy Algebra, Linear Algebra, Algebraic Geometry, Applications of Algebra, Fractal Functions. ANALYSIS:Functional Analysis, Numerical Analysis, Complex Analysis, Function Spaces, Special Functions, Operator Algebras,Inverse and III-posed Problems, Harmonic Analysis,Wavelets, Mathematical Programming, Game Theory,Fractal Signal/ Image Processing, Conformal Geometry,Fixed Point Theory and Applications, Fuzzy Set Theory and Applications, Functional Equations, Summability Theory,Spectral Approximation, Non-smooth Analysis, Optimization Theory, Sampling Theory, Approximation Theory, Control Theory, Computer Aided Geometric Design. APPLIED MATHEMATICS: Convective Heat and Mass Transfer, Computational Fluid dynamics Non-linear Differential Equations, Numerical PDE, Mathematical Modeling, Fluid Mechanics, Bio-Fluid Mechanics, Integral and Differential Equations, Water Waves. APPLIED PROBABILITY AND STOCHASTIC PROCESSES: Applied Probability and Stochastic Processes Operations Research, Stochastic Models, Mathematical Ecology. THEORETICAL COMPUTER SCIENCE AND DISCRETE MATHEMATICS: Theoretical Computer Science, Graph Theory, Combinations, DNA Computing, Theory of Codes, Combinational Optimization, Discrete Mathematics, Formal Language, Automata Theory, Modular Computing, Approximation Algorithms.	Master's Degree in Mathematics / Statistics / Physics / Computer Science or M.Tech (Industrial Mathematics & Scientific Computing).-

Code	Department	Fields of specialization	Minimum Qualification
MDME01	Mechanical Engineering	i) Design Engineering: Machine Elements ~ design development, analysis and performance improvements, New materials and design, composites, nano composites, bio materials, porous materials, radiation damage, surface engineering, design process, contact mechanics, tribology, tyre mechanics, biomechanics, fatigue and failure analysis, computational and experimental fracture mechanics, fatigue crack closure – environment interaction studies, alternate small specimen test methods, small crack propagation under biaxial multiaxialloading, multi crack interaction studies, fatigue damage in composites, failure mechanics of biomaterials. Non linear finite element analysis, Vibration, finite element including coupled problems, Non destructive evaluation, structural health monitoring, Materials Characterization, Measurements of Material Properties and Behavior, machinery signal processing, Condition monitoring of structures machines, machinery diagnosis, and combustion flame noise, Acoustics and Noise Control, Prosthetics and human body movement. (ii) Manufacturing Engineering: Manufacturing Processes, Technologies, CAD/CAM, Manufacturing Planning and Control, Metrology and Computer Aided Inspection, Quality Control, Fracture Mechanics, Materials behaviour in Manufacturing, Surface Treatment, Machining Process, Condition Monitoring, Flexible Manufacturing Systems, Computer Integrated Manufacturing, Non Traditional Machining; Precision Gearing, Sintered Bearings, Manufacturing Methods in Precision Engineering, Surface Technology, Active Noise Control systems, Active Suspensions, Microprocessor Based System Design, Electrohydraulic Servo and Proportional Controls, Pneumatic Systems, Robot-Kinematics, Dynamics, Design and Controls, Multibody Dynamics, System Simulation, Microhydraulics, Mechatronics, Microactuators, MEMS (iii) Thermal Engineering: Micro-miniature and small cryogenic refrigerators, Simulation and optimization of air separation cycles, Heat Transfer in Nano-fluids, Heat Transfer in Multi-Phase Flows, Flow Structure Interaction in High Speed Turbo machinery Seals, Heat Transfer Experiments in Phase Change Material Based Composite Heat Sinks, Two Phase Flow Convection Experiments and Numerical Methods in Porous Media, Solid State Hydrogen Storage, Sorption heating and cooling systems, Desiccant/evaporative cooling and air-conditioning, Conjugate heat transfer in low and high speed flows, Retrieval of geophysical parameters in the atmosphere in the microwave and infra red regions, Turbine rotor stator interaction, Performance improvement of centrifugal compressor by tip modification, subsonic cascade studies, Contrarotating turbines/compressors, Mixed folw compressors, Turbine blade cooling, Secondary loss reduction, Cavitation in hydraulic machines, Micro-scale Flows, Microfluidics, Free Surface flows, Acoustics of Supersonic Jets, Active and Passive Control of High speed flows, Combustion noise, Emissions, Combustion, Propulsion, CFD high speed reacting flows, I.C Engine Combustion and Emissions, alternative fuels, CFD applications in I.C Engines and Gas turbine combustion chambers, fluid flow, heat transfer and combustion related to I.C Engines, advanced I.C Engine technologies such as homogeneous charge, compression ignition, gasoline direct injection, engine management(, Simulation of engine processes and modeling – Combustion diagnostics in engines Heat Transfer in Fuel Cells, Fluidized Bed Combustion, Solar Power Systems, Optimization of Solar Ics Systems.	Master's degree in Mechanical Engineering, Aerospace Engineering, Automobile Engineering, Automotive Engine Tech., Bio-Medical Engineering, Chemical Engineering, Computer Science, Electrical Engineering, Electronics, Energy Engineering, Industrial Engineering, Instrumentation, Maintenance Management, Metallurgical Engineering, Production/ Manufacturing Engineering, Agricultural Engineering and in related areas depending on the research topics.

Code	Department	Fields of specialization	Minimum Qualification
MDMM01	Metallurgical and Materials Engineering	Metal casting, Metal forming, Metal joining, Materials Technology, Physical and Structural Metallurgy, Mechanical Metallurgy, Chemical Metallurgy, Thermodynamics of Metallurgical Systems,. Powder Metallurgy, Ceramics and Composites, Corrosion, Surface Engineering, Biomaterials, Simulation and Modeling of Materials Processing, Nanostructured Materials, Magnetic Materials, Amorphous Alloys, Nonequilibrium Processing, Hydrogen Storage Materials, Smart Materials, Fuel Cells, Metallic Foams, Chemical Sensors, Carbon Nanotubes, Special Steels, Superalloys, Intermetallics, Materials for Optoelectronic Applications, Shape Memory Alloys, Fatigues and Fracture Mechanics, High Temperature Behaviour of Materials and Creep.	Master's degree or other appropriate branch of Engineering/ Technology. Engineering graduates. Engineering graduates (B.Tech/BE or equivalent) and Science postgraduates (M.Sc. or equivalent) to be considered should have exceptional merit and research or industrial experience in the appropriate field.
MDOE01	Ocean Engineering	Ocean Engineering	Master's degree in Aerospace Engineering, Civil Engineering, Marine Engineering, Mechanical Engineering, Marine Structures, Naval Architecture, Ocean Engineering Or any other appropriate engineering discipline. OR M Sc in Physics, Mathematics, Statistics and Oceanography.
MDOE02		Petroleum Engineering	Master's degree in Chemical Engineering, Civil Engineering, Marine Engineering, Mechanical Engineering, Marine Structures, Naval Architecture, Ocean Engineering, Petroleum Engineering Or any other appropriate engineering discipline. OR M.Sc. in Physics, Mathematics, Statistics, Oceanography, Geology and Geophysics.
MDPH01	Physics	Applied Optics, Quantum Optics, Photonics and nonlinear optics, Atomic and Molecular Physics, Complex fluids, Dynamical systems, Statistical physics and field theory, Low temperature physics and superconductivity, Magnetism and Magnetic materials, Hydrogen Storage Materials, Microwaves and Dielectrics, Semiconductor Physics, Photovoltaics, Solid State Ionics and molecular electronics, Thin film phenomena, X-ray diffraction and Amorphous systems, Spintronix and Diluted Magnetic Semiconductors, Condensed Matter Physics/Magnetism in Oxides/Magnetic Materials, Electronic structure of solids/Computational material science, Nonlinear Dynamics, Quantum Chaos, Quantum Information, Metal-oxide Thin films, Nanostructured thin films and heterostructures by PLD.	M.Sc/M.Sc (Tech) in Physics, Applied Physics, Materials Science/M.Tech (Solid State Technology) / M.Tech. (Materials Science) or equivalent.

8. Indian Institute of Technology Roorkee, Roorkee
247 667 – RR

Minimum Educational Qualification:

(a) Masters degree in related discipline with a CGPA of 6.50 on a 10 point scale or equivalent, or 65% for the GENERAL (UR) category. However, candidates having a Bachelors' degree in the related discipline with an excellent academic record, the minimum CGPA being 7.50 on a 10 point scale or equivalent or 75% shall be considered eligible for admission to the Ph.D. programme.

(b) The admission eligibility requirements may be relaxed to 5.5 on a 10 point scale or equivalent, or 55% marks to the SC/ST/PD candidates with Master's degree.

(c) Candidate supported by a sponsoring organization, the applicant having TWO years continuous experience out of which at least ONE year experience with the sponsoring agency at the time of submitting the application form. This category refers to persons who are released from Governmental or Educational Institution on study leave for a period of not less than 3 years for pursuing Ph.D. programme.

Code	Departm	Fields of Specialization	Minimum Qualification
RRAH01	Alternate Hydro Energy	Small Hydro Energy and other Renewable Energy Development.	B.Tech / M.Tech or equivalent in Civil/ Electrical/ Mechanical Industrial/ Chemical/ Environmental / Agricultural/
RRAH02		Environmental management of Rivers and Lakes.	
RRAR01	Architecture and Planning	Architecture, Urban and rural planning, Built Environment including urban design and landscape design, Building science and architecture, Energy and architecture planning, Architectural Climatology, Ecology in relation to architecture and planning, Art in relation to architecture.	Master's degree in Architecture in any of the specializations offered by recognized Institutions of Architecture/Master's degree in Building Science/Technology with a Bachelor's degree in Architecture/Master's degree in Planning in any of the specializations offered by the recognized Institutions of Planning with a Bachelor's degree. in either
RRCH01	Chemical Engineering	**Transport Processes:** Transport phenomena, Fluid dynamics, Fluidization Engg., Packed beds, Slurry transport, Boilingand condensation, Mixing phenomena, Gas-liquid-solid mass transfer. Adsorption, Catalysis and Reaction Engg., Process Intensification, Membrane separation process, Flow of emulsions, Heat integrated Distillation. **Computer Aided Process Plant Design:** Modeling and simulation of Chemical processes. Analysis and optimization of chemical process systems, Heat exchanger networks. Distillation columns. Catalytic reactors and Monolithic converters, Design of chemical equipment, Applied numerical methods, Dynamics and control of chemical processes and equipment, PC-based instrumentation and control, Process Integration, CFD. **Industrial Pollution Abatement:** Environment pollution control strategies, Modeling and simulation of pollution control systems. Modeling of dispersion of air and water pollutants. Treatment methodologies for air pollution and wastewater systems, Hazardous waste management. Risk analysis & hazard management. **Energy Engineering:** Design of energy efficient equipment and Energy conservation in chemical process industries, Bioenergy and Biomass energy systems. **Biochemical Engineering and Down Stream Processing:** Biochemical Engg., Design, Simulation and control of bioreactors, Biogasification. Bioseparation.	i. B.Tech./M.Tech. or equivalent degree in Chemical Engineering. ii. B.Tech./M.Tech. or equivalent degree in any branch of Engineering/ Chemical Technology and interdisciplinary areas. iii. M.Sc. in disciplines consistent with the research areas of the department.
RRCY01	Chemistry	**Analytical; Inorganic; Organic; Physical:** Asymmetric synthesis; Bioanalytical chemistry; Bioinorganic chemistry; Biophysical chemistry; Chemical biology; Chemical kinetics; Coordination chemistry; Development of low cost carbon alternatives for waste water management; Electroanalytical chemistry; Electrochemical sensors and chemical sensors; Electrochemistry; Electronic structure calculations and molecular dynamics simulations; Enantiomeric resolution of pharmaceutically important compounds; Enantioselective catalysis; Environmental chemistry; Epoxidation of olefinic compounds; Evolution and origin of life; Extraction chromatography; Extraction, separation and recovery of metal ions; Heterogeneous catalysis; Inorganic biochemistry; Kinetics and nanomaterials; Liquid chromatography; Macrocycles; Main group chemistry; Metal speciation in environment; Metal-based drugs; Materials modification; Nanomaterials for biomedical and environmental applications; Neutron activation analysis; Organic electrochemistry; Organic materials for OLED and photovoltaic applications; Organic reaction mechanism; Organic synthesis of biological interest molecules and new methodology in organic synthesis; Organometallics (Ru, Si and Sn); Photochemistry; Protein sequencing; Size and shape effects of nanomaterials on their physico-chemical properties; Supramolecular chemistry; Synthesis of heterocyclic compounds; Synthetic polymers/membranes/membrane electrodes; Syntheses of porphyrinoids for material applications; Solid state and materials chemistry; Statistical mechanics of polymers; Rational drug design; Multi component synthesis; Microwave assisted organic synthesis; Theoretical chemistry.	i. M.Sc. or equivalent degree in Chemistry/ Physics. ii. M.Sc. in Bio-technology or M.Sc. in Biochemistry.

Code	Department	Fields of Specialization	Minimum Qualification
RRCE01	Civil Engineering (Specialization code number to be indicated in the data sheet)	**Environment Engineering -** Environmental Pollution, Optimization of distribution network, water and wastewater quality assessment and treatment alternatives, Industrial wastewater treatment, air pollution modeling, abatement and control device, EIA & control water quality modeling, interdisciplinary problems.	i. B.Tech/M.Tech. or equivalent degree in Civil Engineering. Candidate having an M.Tech. Degree but not having a Bachelor's degree in Engineering must have studied Mathematics at the Bachelors level. ii. B.Tech./M.Tech. degree in any branch of Engineering may be considered for research areas consistent with the academic background and experience. iii. M.Sc. Degree in any branch of Science or MCA (with mathematics at the Bachelors level for both M.Sc. and MCA) may also be considered for research areas in Geomatics Engineering.
RRCE02		**Geotechnical Engineering –** Behavior of shallow and deep foundations under static and dynamic loading, Problems of rock mechanics and Underground Space Technology, Static and Dynamic Soil Structure Interaction, Expansive soil, Reinforced earth, Ground Improvement Engineering.	
RRCE03		**Hydraulics Engineering -** Sediment transport & Alluvial stream dynamics. Open channel flows, Wind tunnel studies on Turbulence, Boundary layer and Drag, Ground water hydrology, Ground water flow and transport modeling, Water resources, Surface hydrology, Computational Hydraulics, Irrigation Engineering, Environmental Hydraulics.	
RRCE04		**Geomatics Engineering** - Surveying: Plan, Geodetic and GPS, Photogrammetry-close range, analytical and digital, Geodesy-Geometrical, Physical, Mathematical and Satellite, Remote Sensing-Optical and microwave, Hyperspectral, SAR interferometry, Digital image processing, AI soft computing Fuzzy theory, GIS, Web GIS Applications.	
RRCE05		**Structural Engineering -** Performance Based Design of Concrete/Metal Structures, Risk and Reliability Analysis, Nonlinear Computational Mechanics, Nano-mechanics, Soft Computing and Structural Optimization, Strength and Deformation Characteristics of Reinforced Concrete/Masonry/Structural Steel, High Rise Building Systems, Behavior of Bridge Systems, Laminated Composites and Sandwiched Structures, Thin Walled Structures, Smart Structures, Steel Concrete Composites, Concrete Mechanics, Concrete Durability, Special Concretes, Sustainable Concrete, Recycled aggregate concrete Damage Assessment and Structural Health Monitoring, Retrofit and Rehabilitation of Structures, Structures Subject to Extreme Loads (Wind, Earthquake, Impact, Blast and Fire)	
RRCE06		**Transportation Engineering -**Highway material characterization for pavements, Reinforced flexible pavements, modified binders, composite pavements, pavement management systems, low cost pavements, mixed traffic flow modeling and simulation, highway capacity, Environmental impact assessment, mass transportation systems analysis, Rural Urban and Regional Transport Planning, Road Traffic Safety, Intelligent Transport System, GIS applications.	
RRES01	Earth Sciences	**Geology:** Engineering Geology; Environmental Geology; Geochemistry and Petrology; Geotechnical Investigation; Ore Geology; Petroleum Geology; Remote Sensing and GIS; Sedimentology; Stratigraphy and Paleontology; Structural Geology; Waste Disposal. **Geophysics:** Engineering Geophysics; Exploration Geophysics; Geodynamics; Seismology; Solid Earth Geophysics; Mathematical modeling and Inversion; Geoelectromagnetism.	M.Sc / M.Sc.Tech / M.Tech. degree in Geology / Geophysics / Applied Geology / Applied Geophysics / Geological Technology / Geophysical Technology / Geosciences / Applied Geosciences / Petroleum Geology / Petroleum Geophysics.

Code	Department	Fields of Specialization	Minimum Qualification
RREQ01	Earthquake Engineering	**Structural Dynamics:** Dynamic analysis and design of structures like buildings, dams, bridges and nuclear power plants, Finite & element methods, Static and dynamic nonlinear analysis, Constitutive modeling, Computer aided analysis, Soil-Structure and fluid-structure interaction, Seismic base isolation, Seismic risk analysis, Random vibration theory and probabilistic design methods, Shake table and pseudo dynamic testing of structure and structural components, System identification, Structural response control / Performance Based Design, Seismic Vulnerability and Risk analysis. **Soil Dynamics:** Analytical and experimental studies on dynamic soil properties, Seismic analysis and design of foundations, Wave propagation and ground response analysis, Liquefaction studies using laboratory and field tests, numerical modeling. Nonlinear constitutive models of soils, Finite element dynamic analysis of embankment dams, Dynamic soil-structure interaction analysis, Pile and well foundations for dynamic loads, Machine foundations, Model studies using geotechnical centrifuge for static and dynamic loads, Dynamic earth pressure and retaining walls, Soil improvement techniques, Reinforced earth and geotextiles for seismic loads, Field exploration using SPT, Wave propagation, Block vibration, Cross bore hole and SASW tests. **Engineering Seismology and Seismotectonics:** Microearthquake investigations, Estimation of earthquake source parameters, Seismotectonic modeling, Attenuation characteristics, Strong motion seismology, Broadband seismology, Finite-difference method and study of local site effects, Numerical and empirical ground motion prediction, Estimation of response spectra and design spectra, Probabilistic and deterministic seismic hazard assessment, Vulnerability and Risk Assessment, Seismic microzonation, Remote sensing/GIS/SAR based studies, Pattern Recognition, Earthquake Early Warning Systems.	i. B.Tech. / M.Tech. or equivalent degree in Civil Engineering/ Earthquake Engineering / any branch of Engineering . ii M.Sc./ M.Tech. in Geophysics/ Physics/ Mathematics/ Geology for research areas in Engineering Seismology and Seismotectonics.
RREE01	Electrical Engineering	Power electronics, Electrical drives and their control, Electrical machines analysis and computer-aided design, Power Quality, Embedded Systems, Condition Monitoring of Rotating Electrical Machines, Power Systems Stability, State Estimation, Security, Reliability, Optimization, Expert Systems, Application of neural networks and Artificial Intelligence Techniques, Distribution System Automation, Relaying, Distribution system reforms and bench marking HV engineering, Automatic Generation Control, Restructured Power Systems, Measurement techniques, Smart and intelligent transducer, process instrumentation & control, Power system instrumentation, Applications of digital signal processing, AI & ANN Techniques in Instrumentation, Biomedical Instrumentation, Analysis and modeling of bioelectrical signals and systems, Medical Signals & Image Processing, Operations research, Reliability engg., Optimal scheduling, System modeling, Simulation and analysis, Model reduction techniques, Micro processor and microcomputer based systems for measurement, Monitoring, operation and control, Robotics, Control and optimization.	i. B.Tech./M.Tech. or equivalent degree in Electrical Engineering. ii. B.Tech./M.Tech. or equivalent degree in a branch of Engineering consistent with the research areas as mentioned by the Department from time to time. iii. M.Sc. in a discipline consistent with the research areas as mentioned by the Department from time to time.

Code	Department	Fields of Specialization	Minimum Qualification
RREC01	Electronics and Communication Engineering	Communication Systems	(i) ME. / M.Tech. in Microelectronics/ VLSI / Microwaves / Communication Systems/ Control Systems/Instrumentation/Circuits & Systems or equivalent. (ii) B.E./ B.Tech. in Electronics & Communication/ Electrical Engg. Or equivalent. (iii) M.Sc. in Physics / Instrumentation / Electronic.
RREC02		RF & Microwave Engineering	
RREC03		Microelectronics and VLSI	
RRCS01	Computer Science and Engineering	Computer Science and Engineering	(i) M.E/M.Tech. in Information Technology /Computer Science & Engineering/ Software Engineering or equivalent. (ii) B.E/B.Tech in Computer Science & Engineering/ Information technology or equivalent.
RRDM01	Centre of Excellence in Disaster Mitigation & Management	• Natural/Manmade Hazards and Impact Assessment • Hazard Monitoring, Prediction & Microzonation • Data Processing Techniques & Models	M.Tech. (Civil, Structural, Mechanical, Industrial, Chemical, and Engineering /Computer Science or equivalent, M.Arch & M. 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.
RRHS01	Humanities and Social Science	English, Economics, Psychology and Sociology	(i) M.A. or equivalent degree. (ii) Master's degree in Science / Graduate Degree in Engineering / Technology with 60% marks (or equivalent grade) may be considered for research areas consistent with the academic background and special interest.
RRHY01	Hydrology	Analysis of hydrological extremes, Stochastic hydrology, Reservoir operation, System analysis of water resources, Conjunctive use, Hydraulic and hydrologic routing, Hydrogeology Contaminant transport through open channels and porous media, Surface and ground water pollution assessment, Water quality modeling Remediation of aquatic systems, Water and Wastewater Treatment.	(i) Master's degree in Civil Engg./ Water Resources Development/ Hydrology. (ii) Master's degree in Agricultural Engineering/ Environmental Engg./ Instrumentation / Water use Management. (iii) M.Sc./M.Tech. in Geology/ Geophysics / Soil Science/ Forestry or natural Resources/ Chemistry/ Meteorology/ Atmospheric Physics/ Mathematics/ Nuclear Physics & Environmental Sciences. (iv) M.Sc. Hydrology with Mathematics at bachelor's level.
RRMG01	Management Studies	International Marketing, Service Marketing, Marketing Management, Strategic Management, Health Care Management, Managing Non Profit Organizations, Supply Chain Management, Human Resources Management, Organizational Behavior, Knowledge Management, Financial Accounting and Management, Quality Management, Fuzzy Mathematics, Nonlinear Dynamics and Chaos, Mathematics Finance, Statistical Field Theory, Quantum Information Theory and Quantum Computing, Optimization, General Management including Indian Philosophy Vedic Values, Rural Management & Marketing, Education Business Management, Management Teaching Management, Family Owned Businesses, Bottom of the Pyramid Markets & Business Opportunity Development.	i. B.E./B.Tech. or equivalent, M.E./ M.Tech. or equivalent qualifications. ii. M.Sc./M.A./M.Com. iii. Master of Management/M.B.A. or equivalent.

Code	Department	Fields of Specialization	Minimum Qualification
RRMA01	Mathematics	Elasticity and Vibration, Fracture Mechanics, Fluid Mechanics, Computational Fluid Dynamics, Bio-Mathematics, Numerical Analysis, Operations Research, reliability Theory, Control Computer Applications, Image Processing, Computer Graphics, Summability Theory, Approximation Theory, Statistics, Computerized Tomography, Abstract Algebra, Applied Algebra, Cryptography, Complex Analysis, Mathematical Modeling, Robotics & Control, Symbolic Computation, Theory of Differential Equations, Special Functions.	(i) M.A. / M.Sc. in Applied Mathematics / Statistics /Computer Science / Mathematics / Ind. Mathematics. (ii) M.Stat. (iii) M.C.A.
RRME01	Mechanical and Industrial Engineering	Machine Design Engineering: Machine Design: Computational Mechanics, Computer Aided Design, Experimental Stress Analysis, Fracture Mechanics, Noise Control and Vibrations, Robotics and Control, Solid Mechanics, Tribology, Rotor Bearing Dynamics, Vehicle Dynamics. Machine Diagnostics, Machine Dynamics, Instrumentation & Control, Machanics of Composites, Bio-Mechanics, MEMS/NEMS, Composite and Smart Structures.	(i) B.Tech. / M.Tech. degree or equivalent degree in Mechanical / Industrial / Production Engineering. (ii) B.Tech. / M.Tech.degree in Aerospace / Chemical / Civil / Electrical / Metallurgical Engineering may be considered for research areas consistent with the academic background and special interests
RRME02		Production and Industrial Engineering Systems: Computer Aided Process Planning, Computer Aided Manufacturing, Manufacturing Systems, Metal Casting, Machine Tools and Metal Cutting, Product Design & Development, Unconventional Machining Processes, Advanced Manufacturing, Supply Chain Management, Quality and Reliability Engineering, Processing of Composites, Surface Engineering, ARC Stability Analysis, Design of Weld Joints, Welding Metallurgy, Fracture Mechanics of Weld Joints, Weld Surfacing, Thermal Spraying.	
RRME03		Thermal Engineering Experimental Fluid Mechanics, Micro & Nano Fluidics, Bio Fluidics, Fuel Cell, Combustion and IC Engines, Computational Fluid Dynamics, Energy Systems, Heat Transfer, Thermal Contact Couductance, Refrigeration and Air-Conditioning, Solar Energy, Turbo-Machines, Design of Thermal System, Two-Phase Flow and Heat Transfer Fire Dynamics Erosion Wear.	
RRMT01	Metallurgical and Materials Engineering	Development of Ferrous and Non ferrous Materials, Solidification and P/M Processing of Materials, Mechanical Processing of Materials, Direct reduction process, Aqueous and hot Corrosion, Nano materials and Composites. Tribology of materials, Advanced Welding Technologies and joining of dissimilar materials, Adhesive joining, Fatigue and fracture of materials, Electro Ceramics and Structural Ceramics, Energy Storage Materials, Surface modification and Coatings, Structure property correlation, Polymer technologies etc.	B.Tech / M.Tech. or equivalent, related to following disciplines: Metallurgical Engineering, Materials Engineering, Nanotechnology, Engineering Physics, Engineering Chemistry, Ceramics, Polymers, Corrosion, Mechanical and Production & Industrial Engineering, Chemical Engineering and Electrochemical Engineering. OR 1-M.Sc. degree in Physics, Chemistry, Materials Science. 2-Candidates with a M.Sc. degree, Mathematics as a subject at B.Sc. degree level is an essential requirement. **Note:** Candidate having a degree in Industrial Engineering only shall not be eligible for admission to Ph.D. programme in the Deptt. of Metallurgical and Materials Engineering.
RRNT01	Centre of Nanotechnology	Synthesis of Nanowires/Nanocolloids/Quantum Dots, Nanocomposites & their coatings, Nanobiotechnology, Nanosurface Engineering, Modelling & Simulation, Thin Films & Nanostructures, Photochemistry & Photophysics of Nanomaterials	B.Tech / M.Tech. or equivalent in Nanotechnoloy / Met. & Mat. Engineerign / Mechanical Engineering / Electronics & Communication/ Electronics / Biotechnology./M.Sc. (Physics / Chemistry / Biotechnology) or its equivalent.
RRPH01	Physics	Atmospheric Physics, Atomic and Molecular, Physics, Fibre Optics and Photonics, Laser Physics, Condensed Matter Physics, Nuclear Physics, Thin Film Devices ,High Energy and Particle Physics.	M.Sc. in Physics/ Applied Physics. (i) M.Sc. in Chemistry / Mathematics / Biophysics/ Geophysics/ Computer Science, Provided Physics was a subject at B.Sc. level. (ii) B.Tech. or equivalent in Electrical / Electronics / Chemical / Metallurgical /Engineering Physics. Candidates at Category (ii) and (iii) may be considered for research area consistent with the academic background and special interests.

Code	Department	Fields of Specialization	Minimum Qualification
RRWR01	Water Resources Development & Management	Water Resources Planning, Design, Development and Management (Hydropower, Water Supply, Flood, Control, Irrigation), Surface and Ground Water Hydrology, Environmental Impact Assessment, Water Quality Modeling, Hydraulic and Hydrologic Design Modeling, River Engineering, System Analysis, Interbasin Transfer, Basin Planning and Development, Irrigation Water Management, Agricultural Crop Planning, Natural Resources Management using Remote Sensing and GIS.	(i) Water Resources Development B.E. / B.Tech. / M.E. / M.Tech or equivalent degree in Civil, Electrical, Mechanical or Agricultural Engineering. (ii) Irrigation Water Management Master's Degree in Agricultural Sciences / Social Sciences / Chemical Engineering / Biological Sciences / Environmental Sciences / Engineering / Natural Sciences with at least one paper of Mathematics at the graduate level.
RRBT01	Biotechnology	Molecular Biophysics, Genetics, Microbiology & Microbial biotechnology, Molecular biology, & Proteomics, Endocrinology, Environmental biotechnology, Plant biotechnology, Biochemical Engineering, Biochemistry protein crystallography & Bioinformatics, Virology	i. Master's degree in any disciplines of Science. ii. Bachelor's/ Master's degree in medical sciences, Engineering, Pharmacy, Veterinary and related disciplines.
RRPP01	Paper Technology (Saharanpur Campus)	Pulp Processing, Non-wood fiber pulping, Secondary fiber pulping, Recycling, Paper Making, Paper Properties, Printing, Energy Management, Chemical Recovery, Environmental Science & Engineering, Industrial Chemistry, Pollution free bleaching, Modelling of Process Systems, Wood Chemistry, Electronics, Instrumentation and communication, Biotechnology, Nanotechnology	(i) B.E. / B.Tech. / M.E. / M.Tech. in Pulp & Paper Engg., Chemical Engg., Mechanical Engg., Environmental Engg., Electrical Engg., Electronics & Communication Engg., Computer Science & Engg., Instrumentation Engg. and VLSI Engg., Information Technology, Biotechnology, Material Science or its equivalent degree. (ii) M.Sc. in Chemistry, Environmental Science, Biotechnology, Botany or its equivalent degree (with Mathematics as one subject at the Bachelor's level).
RRPP02	Polymer and Process Engineering (Saharanpur Campus)	Polymer Engineering, Biopolymers, Nanopolymer, Functional Polymers, processing Engineering, Tissue Engineering, Financial Management, Modelling & Simulation Performance Coatings, Process Optimization organic Metallic and Hybrid Polymer.	(i) B.E. / B.Tech / M.E. / M.Tech in Polymer, Chemical, Process Engg., Environmental Engg., Biotechnology, Nanotechnology, Computer Science or its equivalent degree. (ii) M.Sc. in Chemistry, Medical Sciences or equivalent, Biotechnology, Physics, Mathematics, Microbiology or its equivalent degree (with Mathematics as one subject at Bachelors level)
RRPP03	Applied Science and Engineering (Saharanpur Campus)	Degradation of materials, Microbial Corrosion, Coating, Nanomaterials, Nanoscience, Energy Storage devices, Li-battery, Super Capacitor and Fuel Cell, Fuel Cells, Theoretical Physics, Superconductivity, Nanomagnets, Materials Chemistry, Applied Mathematics, Industrial Mathematics, Optimization, Cloud Computing, English, Humanities.	(i) M.Sc. in Physics, Mathematics, Applied Mathematics, Statistics, Chemistry, Material Science, Nanomaterials, Nanoscience and Nanotechnology or its equivalent degree (with Mathematics as one subject at the Bachelor's level). (ii) M.A., M.Com., M.B.A. or its equivalent degree. (iii) B.E./ B.Tech/ M.E. / M.Tech. in Mechanical Engineering, Material Science or its equivalent degree, Metallurgical Engg., Biotechnology, Nanotechnology, Solid State Technology, Chemical Engineering, Computer Science or its equivalent degree.

9. Anna University, Chennai 600025 – AU

A minimum of 55% of marks/CGPA of 5.5 on a 10 point scale in Master's degree in Engineering/Technology. In case of SC/ST candidates, 50% marks or CGPA of 5.0 on a 10 point scale in the respective Master's degree. Candidates will be selected based on written test.

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Code	Department	Fields of specialization
A.C Tech. Campus, Chennai-25		
AUCH01	Chemical Engineering	Petroleum Refining and Petrochemicals, Ceramic Technology, Chemical Engineering, Polymer Science and Engineering
AULT01	Leather Technology	Leather technology, Footwear Science & Engineering.
College of Engineering, Guindy, Chennai- 25		
AUCE01	Civil Engineering	Environmental Engineering, Structural Engineering, Hydrology and Water Resources Engineering, Construction Engineering and Management, Irrigation Water Management, Urban Engineering, Remote Sensing, Soil Mechanics and Foundation Engineering.
AUEE01	Electrical Engineering	Power Systems Engineering, Control and Instrumentation, Power Electronics and Drives, High Voltage Engineering, Electronics Engineering, Instrumentation Engineering.
AUIC01	Information & Communication Engineering	Optical Communication, Medical Electronics, Applied Electronics, Communication Systems, Laser and Electro Optical Engineering, Computer Science & Engineering, Software Engineering.
AUME01	Mechanical Engineering	Internal Combustion Engineering, Refrigeration and Air-conditioning, Energy Engineering, Engineering Design, CAD/CAM, Product Design and Development, Mechatronics, Automobile Engineering, CAD
Madras Institute of Technology Campus, Chennai-44		
AUAE01	Aerospace Engineering	Aircraft Structures, Aerodynamics, Propulsion
AUAU01	Automobile Engineering	Alternate fuels, IC combustion, Simulation of Engine, Vehicle Dynamics, Automotive Chassis
AUEC01	Electronics Engineering	Networking, Communication, VLSI, Embedded, Electronics, Avionics, Signal and Image Processing
AUIN01	Instrumentation Engineering	Process Modeling and Control, Fault diagnosis, VLSI, Biomedical Instrumentation, Transducers and Measurement
AUPT01	Production Technology	Manufacturing Processes, Metrology, Mechatronics, Metallurgy Manufacturing Management, Robotics, Automation, Production

10. Basaveshwar Engineering College, Bagalkot 587 102 –BB (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
BBCE01	Civil Engineering	Structural Engineering, Geotechnical Engineering & Environmental Engineering	M.Tech/ ME in Civil Engineering
BBME01	Mechanical Engineering	Material Science & Metallurgy, Deign and Dynamics & Thermal Engineering	M.Tech in Mechanical/ Automobile/ Industrial & Production Engineering
BBEE01	Electrical Engineering	Renewable Energy Sources, Power Electronics & Drives, Signal Processing	M.E/ M.Tech in Electrical & Electronics Engineering
BBEC01	Electronic & Communication Engineering	Speech Processing, MEMS, Computer Communication & Networking	M.Tech/ M.E in E & E / E & C / Telecommunications/ Instrumentation & Technology
BBCS01	Computer Science & Engineering	Image Processing, Soft Computing, Intelligent Systems & Adhoc networks	M.Tech / M.E CSE, CN, CE, & ECE

11. Indian Institute of Engineering Science and Technology, Shibprur- BE (Formerly Bengal Engineering and Science University, Shibpur)

Code	Department	Fields of specialization	Minimum Qualification
BECE01	Civil Engineering	Structural Engineering. & Concrete Technology, Soil Mechanics & Foundation Engineering, Water resource Engineering, Environment Engineering, Highway and Traffic Engineering Etc.	Post Graduate Degree in the relevant field in engineering or equivalent.
BEEE01	Electrical Engineering	Power Systems, Electrical Machines, Control Systems, Power Electronics & Drives,	Post Graduate Degree in the relevant field in engineering or equivalent.
BEME01	Mechanical Engineering	Machine Design, Heat Power Engineering, Production Engineering.	Post Graduate Degree in the relevant field in engineering or equivalent.
BEMI01	Mining Engineering	GSI/GPS/Remote Sensing, Occupational Health & Safety, Coal bed methane & Carbon sequestration, Mine Environment, Mineral Dressing.	Post Graduate Degree in the relevant field in engineering or equivalent.
BEAE01	Aerospace Engineering and Applied Mechanics	Bio-Mechanics, Soil Structure, Robotics, Fluid Mechanics/ Hydraulics, Computational Mechanic.	Post Graduate Degree in the relevant field in engineering or equivalent.
BEIT01	Information Technology	Systems Architecture Design and Test, Theory and Applications of Cellular Automata, Digital Image Watermarking and Signal Processing, Digital Geometry and Mobile Communication, Sensor Network.	Post Graduate Degree in the relevant field in engineering or equivalent.
BEMT01	Metallurgy and Materials Engineering	Nano Materials, High Strength Steel, Phase Transformation, Diffusion Bonding, Neural Network, Tribology.	Post Graduate Degree in the relevant field in engineering or equivalent.

12. BMS College of Engineering, Bagaluru 560 019 –BS

Code	Department	Fields of specialization	Minimum Qualification
BSCE01	Civil Engineering	Structural masonry, New generation concrete, Alternative building materials and technology, Remote sensing and GIS, Water resource management, Pavement material and evaluation, Environmental Engineering, Fracture behavior of concrete, Soil stabilization, Ground	M. Tech.
BSEE01	Electrical Engineering	Power engineering, power distribution, Power electronics and drives. Nano Technology Photo Voltaic cells Power quality.	M. Tech.
BSME01	Mechanical Engineering	Structural dynamics, Tribology, Solid mechanics, Composite materials, Structural health monitoring, Smart materials and structures, Optimization, Nontraditional machining, Design engineering, Powder Metallurgy, Contact Mechanics, Fretting Mechanics, Fatigue of Materials & FEM, Conventional / Unconventional Machining, Advanced Materials Heat Transfer, Heat Pipes, Fluid Mechanics.	M. Tech.
BSIE01	Industrial Engineering & Management	ERP and Ergonomics, Quality and reliability, Maintenance engineering, Production process, Facility planning.	M. Tech.
BSEC01	Electronic & Communication Engineering	Nonlinear control strategies, Embedded system Design, signal processing, Power electronics, Image Processing and pattern classification. Low power electronics, Wireless Communication, Wireless Sensor Networks, Synthesis and characterization of semiconductor alloys for various applications, Automotive Electronics.	M. Tech.

13. Coimbatore Institute of Technology, Coimbatore 641 014–CC (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
CCCE01	Civil Engineering		
CCME01	Mechanical Engineering		
CCEE01	Electrical & Electronics Engineering		
CCCH01	Chemical Engineering		

14. College of Engineering Trivandrum, Thiruvananthapuram 695 016– CT

Code	Department	Fields of specialization	Minimum Qualification
CTCE01	Civil Engineering	Traffic and Transportation Engineering, Geotechnical Engineering, Structural Engineering.	M.Tech./M.E. degree in relevant field of Engineering
CTME01	Mechanical Engineering	Fluid Mechanics, Heat Transfer, Thermodynamics and Combustion, Computational Fluid Dynamics, Thermal Engineering, Refrigeration and Air conditioning, Energy Management, Alternate Energy Sources and Fuels, Machine Dynamics, Condition Monitoring, Vibration, Fluid Structure Interaction, Smart/Intelligent Structures, Vibration, Machine Design, System Modeling and Simulation, System Dynamics, Optimization Techniques, Operations Management, Supply Chain Management, Financial Engineering, Ergonomics, Tribology, Wear and Lubrication	
CTEE01	Electrical Engineering	Power Systems, Electrical Machines, Control Systems, Guidance & Navigational Control, Power Electronics & Drives.	
CTEC01	Electronics & Communication Engineering	Radio Frequency Engineering, Signal Processing, VLSI Circuits, Motor Drives, MEMS, Image Processing, Computer Vision, Wireless Communication, Optical Communication.	

15. College of Engineering, Pune 411 005 – CP

Code	Department	Fields of specialization	Minimum Qualification
CPCE01	Civil Engineering	Construction Management, Geotechnical Engineering, Soil Liquefaction, Pavement Engineering, Ground Improvement, Laboratory and Field, Practices in Foundation Engineering, Soil, Structure Interaction; Structural Engineering, Water Resources Engineering, Town and Country Planning.	Master's degree in Civil Construction Management, Geotechnical Engineering, Structural Engineering, Water Resources Engineering, Town and Country Planning.
CPME01	Mechanical Engineering	Heat Transfer, Fluid Mechanics, I C Engines, Solar Energy, Automobile Technology, Refrigeration, air conditioning, energy management. Vibration and Acoustics, Tribology, Industrial Engineering, Micro Machining.	Master degree in Mechanical/ Automobile/ Industrial/ Production Engineering and allied specializations.
CPPE01	Production Engineering	Non-Traditional Machining, Machining, Machine Tools and Metal Cutting, Micro Machining, Casting, Welding and Forming Processes, Tool Design, Rapid Prototyping and Tooling, Modeling and Simulation of Manufacturing Processes, Manufacturing Automation and Control, Ergonomics, Intelligent Manufacturing, Cellular Manufacturing, Dimensional Tolerance Technology, CAD/CAM, Finite Element Analysis, Features Based Modeling, Computer Aided Process Planning, Intelligent Product Design and Manufacturing CIMS, Product Lifecycle Management, Quality Engineering, Planning, Scheduling, Queuing, Management of Operations, Advanced Manufacturing, Materials Processing and Heat Treatment, Metal Forming, Structural Ceramics Composite Materials, Metal Matrix Composites, Tribology of Advanced materials, Surface Engineering, Magnetic Materials, Electromagnetic Materials and Processing, Ferroelectric Ceramics, Electronics Materials, System Reliability Assessment, Maintenance Management, Machine Diagnostic and Condition Monitoring, Reliability and Design, Reliability Simulation, Machinery Fault Diagnosis, Terotechnology, Maintenance Engineering & Management, Risk and Safety Assessment, Software Reliability, Enterprise Resource Planning (ERP).	Master degree in Production/ Mechanical/ Auto mobile/ Industrial Engineering and allied specializations.

Code	Department	Fields of specialization	Minimum Qualification
CPEE01	Electrical Engineering	Electrical Machines:- Permanent Magnet Machines, Linear Machines and Special Purpose Machines • Power Electronics:- Topologies, Applications to Drives and Power System (FACTS/HVDC), Power Quality and Super Capacitors. • Control System:- Sliding Mode Control, Robust Control and Modeling of Large System.	Master's degree in Electrical Engineering.
CPEC01	Electronic & Telecommunication	Image Processing and Pattern Recognition, Machine Vision Systems, Next Generation Networks, VLSI Architecture, Development for Signal Processing and Communication Applications, Information Security, Using Water Marking, Image Analysis for Medical/Document/ Agro Based Products/ Microstructure/ Metallographic/ Satellite Images, Speech and Audio Processing, Synthesis and Coding.	Master's degree in Electronics/ Electronics & Telecommunication Engineering.
CPCS01	Computer Engineering & Information Technology	Computer Networks, Information Security, Formal Methods and Verification, Bioinformatics, Machine Learning, Distributed Computing, Biometric Watermarking, Parallel Computing, Data Mining, Cloud Computing, IT enabled Business Transformations and Software Engineering.	Master's degree in Computer Engineering/ Software Engineering/ Information Technology.
CPIN01	Instrumentation and Control	Process Control, Biomedical Instrumentation, Control System Power Converters, Agricultural Instrumentation, Sensors/ Transducers, Clinical Diagnosis/ Predictions	Master's degree in Instrumentation/ Electrical/ Biomedical/ Electronics/ Computer/ Chemical Engineering.
CPMT01	Department of Metallurgy & Materials Science	Physical Metallurgy, Process Metallurgy, Casting, Welding, Metal Working, Corrosion and Surface Modification, Heat Treatment, Cryogenic Treatment, Power Metallurgy, Ceramics, Polymers, Composite Materials; MMC, Nano Composites, Polymer Based Composites, Iron and Steel Making.	Master's degree in Metallurgy, Materials Science, Mechanical Production Engineering.

The College of Engineering Pune is affiliated to Pune University. As per the university rules, the candidate seeking admission to Ph.D course has to qualify in the entrance examination of Paper-1 and Paper-II of the University of Pune and then he/she will be eligible for selection through interview for Ph.D admission.

However the candidate is exempted from qualifying entrance examination in Paper-I and Paper-II of Pune University if the candidate fulfills the following criteria.

(a) Candidates having a **GATE score**

(b) Candidates who are having minimum five years of approved teaching experience

16. Delhi Technological University, Delhi –DD

Code	Department	Fields of specialization	Minimum Qualification
DDCE01	Civil Engineering		
DDME01	Mechanical Engineering		
DDEE01	Electrical Engineering		
DDPS01	Polymer Science & Chemical Technology		

17. Govt. College of Engineering, Aurangabad 431 005 – GA (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
GACE01	Civil Engineering	Water Resources Engineering, Environmental Engineering,	M.E/M.Tech Degree of the recognized University in Civil Engineering/ Environmental Engineering/ Water Resource Engineering/ Water Resource Management.
GAEE01	Electrical Engineering	Power Systems, Control System	M.E/M.Tech Degree of the recognized University in Electrical/Electrical (Electronics & Power)/ Electronics & Power/ Electronics/ Instrumentation and allied branches of Engineering and Technology
GAEC01	Electronics & Telecommunication Engineering	Signal and Image Processing, Communication Engineering	M.E/M.Tech Degree of the recognized University in Electronics/ Electronics and Communication/ Electronics and Telecommunication / Computer Engineering/ Computer Technology / Computer Science and Technology / Computer Science/ industrial Electronics/ Electronics Product Design Technology/Power Electronics / Instrumentation/ Information Technology.

18. Govt. Engineering College, Thrissur 680 009– GK

Code	Department	Fields of specialization	Minimum Qualification
GKCE01	Civil Engineering	Hydraulics & Water resources Engineering, Environmental Engineering.	Masters in Technology / Engineering Degree in the relevant field.
GKME01	Mechanical Engineering	Fracture Mechanics, Structural Mechanics, Computational Mechanics, Finite Element Analysis, Stress Analysis, Manufacturing Technology & Computational Fluid Dynamics	
GKEE01	Electrical Engineering	Power Electronics & Drives, Power Quality, Power systems, Energy Management, High Voltage, Image Processing in Biomedical Applications/Control Systems, Soft Computing & Applications,	

19. Govt. College of Engineering, Salem – 636 011 – GC

Code	Department	Fields of specialization	Minimum Qualification
GCCE01	Civil Engineering	Structural Engineering Environmental Engineering	ME/M.Tech. First Class or M.S.(by research) in the relevant branch of Engineering
GCME01	Mechanical Engineering	Mobile Robotics, Nano Coating/Nano Fluids, Composite Material Characterization, Alternate Refrigerants, Engine Research with Biofuels, Micro Machining, Design/Thermal Engineering	ME/M.Tech. First Class or M.S.(by research) in the relevant branch of Engineering
GCEE01	Electrical Engineering	Electrical and Electronics Engineering including power systems Engineering, High Voltage Engineering, Power Electronics and Drives, Embedded control Systems, Control and Instrumentation, Embedded System Technologies.	ME/M.Tech. First Class or M.S.(by research) in the relevant branch of Engineering

20. Guru Nanak Dev Engineering College, Ludhiana – 141 006 - GN

Code	Department	Fields of specialization
GNCE01	Civil Engineering	1. Structure Engineering, 2.Geo-Technical Engineering, 3. Transportation Engineering. 4. Computer Aided Design.
GNME01	Mechanical Engineering	1. Thermal Engineering, 2. Industrial Engineering, 3. Production Engineering.
GNEE01	Electrical Engineering	1. Power Systems Operation and Control 2. Restructuring of Power System

21. Indian School of Mines, Dhanbad 826004 – IS

The eligibility for Ph.D Programmes is 1st class or equivalent in post-graduate degree.

Code	Department	Fields of specialization	Minimum Qualification
ISMI01	Mining Engineering	Coal Mining, Metalliferrous Mining, Mine Planning & Design, Mine Systems Engineering, Rock Mechanics, Rock Excavation Engineering, Mine Environment, Open Cast Mining, Mine Surveying, Mine and Mineral Economics, Mine Management, Surface Environment, Marine Mining, Mine Safety Engineering.	Master's degree in Mining Engineering.

22. Institute of Technology, Banaras Hindu University, Varanasi 221005 – VN

Minimum eligibility for Ph.D. Programme in Met. Engineering. Is Master's degree in Metallurgical or an equivalent branch of Engineering with 55% marks (or equivalent grade point average) or in Chemistry, or Physics with 60% marks for Ph.D. in Mining Engineering with 55% marks (or equivalent grade point average) or M.Sc. in Geology with 60% marks

Code	Department	Fields of specialization
VNMT01	Metallurgical Engineering	Deformation and Fracture, Phase Stability, Phase Transformations, Rapid Solidification Processing Including Metallic Glasses Nano-materials Metallurgical Thermodynamics and Kinetics, Corrosion and Environmental Stability, Metal Casting Technology and Tribological Studies, Non-Ferrous Extractive Metallurgy, Ferrous Extractive Metallurgy, Process Simulation Studies, Agglomeration of Ore Fines and Utilization of Metallurgical Wastes.
VNMI01	Mining Engineering	Rock Mechanics & Ground Control, Mine Environment, Mine Planning & Design, Mining Machinery, Numerical Modeling of Mining Structures.

23. Jadavpur University, Kolkata 700032 – JU

Eligibility for candidates of SC/ST/PD to Ph.D degree programme (Engineering./Tech./Arch./Pharm.) of Jadavpur University is at least "Pass Class" marks in Master's Degree in Engineering./Tech./Pharm./Arch. or equivalent.

Code	Department	Fields of specialization	Minimum Qualification
JUEE01	Electrical Engineering	**Control Systems:** Control and guidance, Knowledge-based systems, Artificial Intelligence, Software Engineering, Stochastic Processes, Distributed Computer Control Theory, Motion Control and Power Conditioning.	Master's degree in Electrical Engineering
JUEE02		**Electrical Machines:** System Optimization, Optimal Design of Electrical Machines, Synchronous Machines Stability, Electrical Drives, Wind Energy.	
JUEE03		**Electrical Measurements:** Digital and Microprocessor-based Instrumentation, Biomedical Instrumentation, Digital Signal Processing, Process Instrumentation, Fiber Optic Instrumentation.	
JUEE04		**High Voltage Engineering:** High Voltage Laboratory Techniques, Field Analysis and Computation, Discharge Phenomena in Gas, Liquid and Solid and Solid Media, Dielectric Engineering, Surge Analysis.	
JUEE05		**Power Systems:** Computer-Aided Power System Analysis Microprocessor Applications, Power Electronics, Power Systems Protection, Power System Control.	
JUEC01	Electronics and Telecommunication Engineering	**Communication Engineering:** Digital Communication, Data Compression, Image Processing, Fiber Optic Communication, Analog and Digital Mixed Signal Circuits and Systems.	Master's degree In Electrical & Telecommunication Engineering
JUEC02		**Computer Engineering:** Programme Semantics, Compiler, Operating System, Computer Architecture, Artificial Intelligence, Pattern Recognition, Neural Networks	
JUEC03		**Control Engineering:** Digital Control, Robotics, Adaptive and Optimal Control, Fuzzy Control	
JUEC04		**Electronic Devices:** Photovoltaic Energy Conversion, Power Semiconductor Devices, Semiconductor Device Modeling, Electrical Conduction and Related Phenomena in Semiconductors and Superconductors, Microelectronics Technology, Nano Crystalline Materials and Devices, EDA, Sensors, MENS, VLSI Circuit Design and Implementation	
JUEC05		**Microwave Engineering:** Microwave and Millimeter Wave Antenna Theory and Technique, Microstrip Components, Antennas and Arrays, Electromagnetic Interference and Compatibility, Electrostatic Charging and Discharging.	
JUME01	Mechanical Engineering	Applied Mechanics	Master's degree In Mechanical Engineering with at least 60% marks (and also in the preceding degree)
JUME02		Heat Power Engineering	
JUME03		Fluid and Hydraulic Engineering (incl. Water Resources)	
JUME04		Production Engineering	
JUME05		Machine Design (including Bioengineering)	
JUPE01	Production Engineering	**Production Technology:** Machine tools and Metal cutting, Non-tradition machining, Advanced material machining, CAD/CAM, Robotics, Tribology, Computer integrated manufacturing, Flexible automation, Precision engineering, Micro machining, Ergonomics, Designing for production, Manufacturing systems simulation.	Master's degree in any
JUPE02		**Production Management:** Operations management, Quantitative management, Terotechnology, Reliability, Behavioral science, Enterprise resource planning (ERP), Supply chain management (SCM), Quality engineering, Waste management.	

24. Madan Mohan Malaviya University of Technology Gorakhpur - 273 010 (Uttar Pradesh) MM

The minimum requirement is 60% or equivalent CPI (for SC/ST 55% or equivalent CPI) at qualifying degree.

Code	Department	Fields of specialization
MMCE01	Civil Engineering	**1. Geotechnical and Geo-Environmental Engineering** • Ground Characterization • Ground Improvement • Solid Waste Management • Innovative Foundations • Physical Modeling **2. Hydraulics and Water Resources Engineering** • Fluvial Hydraulics • Local Scour • Scour and Scour Counter Measures • Hydraulics Structures • River Training & Protection Works **3. Environmental Engineering** • Air Pollution • Noise Pollution • Effluent Treatment Process and Modeling • Water Characterization 4. **Remote Sensing and Engineering Survey** • GIS and Its Application • GPS and Its Application • Remote Sensing/Geospatial Engg. **5. Structures** • Concrete Structures • Steel Structures
MMEE01	Electrical Engineering.	Bio-instrumentation/Bio-Medical Signal Processing, Power Electronics, Electrical Machines and Drives, Power System Analysis, Restructuring and FACTS Devices, Advance Control, Process Control and Instrumentation.
MMEC01	Electronics & Communication Engineering	1. Communication and Signal Processing • Wireless Communication • Computer Communication • Microwave • Antenna Communication Network • Optical Communication • Signal Processing & Coding Theory
		2. Integrated Electronics & Circuits • **VLSI Design.** • **Analog & Digital Circuits Design & Microelectronics**
		3. Electronic System • **Embedded System Design** • **Electronic Instrumentation Digital Signal Processing and Audio and Speech Processing.**
MMME01	Mechanical Engineering	1. Production & Industrial Engineering • Metal Cutting, Advanced Manufacturing Technology, CAD/CAM.CIM, Automation, Robotics, Quality Management, Inventory Management, Supply Chain Management Operations Research, Modeling and Simulation, System Dynamics, Material Science.
		2. Design Engineering • Design Engineering: Stress-strain Analysis, Mathematical Modeling, CAD, and Optimization. Mechanical Vibration.
		3. Thermal Science • IC Engine, Heat and Mass transfer, Thermodynamics, Refrigeration and Air Conditioning. Turbo-Machines, Compressible flow, Automobile Engineering, Alternate Energy Resources, Emission Control, and Hydrogen Energy.

25. Madhav Institute of Technology & Science, Gwalior – 474 005 – MG

Code	Department	Fields of specialization	Minimum Qualification
MGCE01	Civil Engineering	Water Resources Engineering; Construction Technology & Management; Structural Engineering	M.E./M.Tech. or Equivalent degree in Civil Engineering with at least 60% marks or equivalent grade (55% marks or equivalent grade for SC/ST candidates)
MGEE01	Electrical Engineering	Power systems; Biomedical Signal Processing; Application of AI & Soft Computing Techniques for Electrical Engineering; Condition Based Maintenance of Electrical Machines	M.E./M.Tech in Electrical Engineering with at least 60% marks or equivalent grade (55% marks or equivalent grade for SC/ST candidates)
MGCS01	Computer Science & Engineering	Data Mining & Warehousing; Image Processing & Retrieval Techniques; Networking	M.E./M.Tech in Computer Science & Engineering or Information Technology or any other Specialization of Computer Science & Engineering and Information Technology with at least 60% marks or equivalent grade (55% marks or equivalent grade for SC/ST candidates)
MGME01	Mechanical Engineering	Vibration & Noise Control; Design Engineering; Maintenance Engineering Tribology; Condition Monitoring; Industrial Engineering; Supply Chain Management; Production Engineering; Material Handling; Non-Conventional Energy System.	M.E./M.Tech. in the relevant discipline with at least 60% marks or equivalent grade (55% marks or equivalent grade for SC/ST candidates).
MGAR01	Architecture	Architecture, Environmental Planning, Urban Planning, Construction Technology.	M.Arch., M.Planning, M.E. or M.Tech. (Civil), (Master in any Architecture related subject) with at least 60% marks or equivalent grade (55% marks or equivalent grade for SC/ST candidates).

26. Manipal Institute of Technology – Manipal 576 104 MI

Code	Department	Fields of specialization	Minimum Qualification
MICE01	Civil Engineering	Structural Engineering	BE/B.Tech. in Civil Engineering, PG in Structural/ Geotechnical Engineering with minimum 55% marks
MICE02		Geotechnical Engineering	
MICE03		Environmental Engineering	BE/B.Tech. in Civil/Environmental Engineering, PG in Hydraulics/ Water Resources/ Environmental Engineering with minimum 55% marks
MICE04		Water Resources Engineering	
MICE05		Earth Science	M.Sc. Geology/M.Sc. Marine Geology with minimum 55% marks
MIMM01	Mechanical and Manufacturing Engineering	Tribology	PG in Machine Design/Manufacturing Engineering or related streams with minimum 55% marks.
MIMM02		Machining of Metals & Composites	PG in Manufacturing Engineering or related streams with minimum 55% marks.
MIMM03		IC Engines & Combustion	PG in Thermal Engineering or related streams with minimum 55% marks.
MIMM04		Solar Thermal Energy	
MIMM05		Turbomachinery	
MIMM06		Biomechanics	PG in Machine Design/Biomedical Engineering or related streams with minimum 55% marks.
MIMM07		Corrosion Engineering	PG in Material Science/ Metallurgy/ Manufacturing Engineering with minimum 55% marks

27. Motilal Nehru National Institute of Technology, Allahabad 211 004 – MN

The minimum requirement is 60% or equivalent CPI(for SC/ST 55% or equivalent CPI) at qualifying degree.

Code	Department	Area of Research	Minimum Qualification
MNAM01	Applied Mechanics	Solid Mechanics , Computational Mechanics, Composite and smart structures, stability and dynamics of structures, Advanced Engineering Material, Robotics and Mechanisms, Fluid Mechanics, and Machines, Multiphase Flow, Computational Fluid Dynamics, Biomechanics and MEMS,	M.Tech or Equivalent degree Mechanical Engineering, Civil Engineering, Metallurgical Engineering, Material Science, Applied Mechanics, Fluid Engineering, Aeronautical Engineering, Chemical Engineering, Marine Engineering, Biomedical Engineering, M.Sc of equivalent degree in Physics/ Mathematics
MNAM02	Biotechnology (Under Applied Mechanics)	Molecular Biology, Microbiology, Environmental Biotechnology, Agricultural Biotechnology, Immunology and Bioprocess development.	M.Tech (biotechnology) , Bioinformatics and Biochemical Engineering, or M.Se. in Biotechnology or M.Se. in Applied Biological Science Such as Microbiology, Biochemistry, Genetics, Molecular Biology, Pharmacy and Biophysics,
MNCE01	Civil Engineering	Structural Engineering, Geotechnical Engineering, Environmental Engineering, Transportation Engineering, GIS, Environmental Geotechnical, Remote Sensing, Water Resource Engineering,	M.Tech or Equivalent degree in Aeronautical Engineering, Architectural Engineering, Civil Chemical Engineering, M.Sc. Environmental Science or Equivalent.
MNCS01	Computer Science & Engineering	Data Base, Software Engineering, Mobile Computing, Parallel Computing, Computer Architecture , Computer Algorithmic , Data Mining , Knowledge Based System System, Real Time System, Distributed Computing	M.Tech or Equivalent degree in Computer Science & Engineering, Software Engineering, Information Technology, Electrical Engineering, Electronics Engineering and Communication Engineering.
MNEE01	Electrical Engineering	Control Systems and Mathematical Modeling, Nonlinear Systems, Model Reduction, Fuzzy Logic, Neural Networks, Al in , Power Systems, Wireless Sensor Networks, Transmission Systems & FACTs, Power Electronics, Distribution Systems and Custom Power Devise, Distrubited Generation & Control , Power Quailty Modem, Electric Drives, Instrumentation Systems , Bio-medical Instrumentation, Virtual Instrumentation , Power Systems Protection.	M.Tech or Equivalent degree in Electrical Engineering, Electronics and Communication Engineering and Electronics Electrical Engineering, Electronics Engineering and Communication Engineering.
MNEC01	Electronics & Communication Engineering	Data Communication and Networking, Optical Communication, Digital Signal Processing, Image Processing, Mobile and ATM Networks, Analog and Digital Circuits.	M.Tech or Equivalent degree in Electrical Engineering, Electronics and Communication Engineering and Electronics Electrical Engineering, Electronics Engineering and Communication Engineering
MNME01	Mechanical Engineering	Thermal Sciences (Heat Transfer, Energy Conversion, Refrigeration and Air-conditioning), Turbo machines, CAD/CAM/FMS, Fatigue and Fracture Mechanics, Unconventional Manufacturing Processes, Metal Cutting. Metal Forming, Noise and Vib rations, Industrial Engineering Rapid Prototyping and Reverse Engineering, Knowledge Management.	M.Tech or Equivalent degree in Mechanical, Aeronautical, Automobile, Chemical, Production , Metallurgical Engineering, Industrial Engineering,
MNME02	Chemical Engineering (Under Mechanical Engineering Dept.)	Separation Process , Heat Transfer, Mass Transfer, Chemical Reaction Engineering, Modeling and Simulation, CFD, Energy Conversion,	M.Tech or Eqvielant degree in Chemical Engineering, Petroleum Studies, Environment , Biotechnology.
MNME03	Center of Energy Studies (Under Mechanical Engineering Dept.)	Non- Convectional Energy Resources Management, Thermal Systems Design.	M.Tech or Equivalent degree in Mechanical, Aeronautical, Automobile, Chemical, Production , Metallurgical Engineering,

Code	Department	Area of Research	Minimum Qualification
MNCY01	Chemistry	Organic –Metallic Material Chemistry , Polymer Chemistry, Environmental Chemistry, Nano Technology, Nano Chemistry , Bio- Inorganic, Photo-Chemistry, Drug Delivery , Co- ordination Chemistry.	M.Se in Chemistry/ Applied Chemistry With 60% marks (55% or Equivalent for SC/ST candidates) For interdisciplinary Field of Research Master degree in any Discipline of Science with 60% marks . M.Tech. B.Tech 75% marks (70% or Equivalent for SC/ST candidates),
MNHS01	Humanities and Social Science	Commonwealth Literature, Psychology , Organizational Behavior , Social Psychology, Entrepreneurship, British /literature, American Literature, English Language Speaking and Human Recourses Management , Rural Economics , Allied Social Science, Accounting and Financial Management.	M.A in English or Psychology/ MBA/MSW With 60% aggregate marks or Equivalent CPI (%%% or Equivalent for SC/ST Candidates).
MNPH01	Physics	Condensed Matter Physical/ Solid State Physics, Solid State Gas Sensors, Carrier Transport in Thin Films, Interface States Studies in Semiconductor Device , Characterization of Material, Nonlinear Dynamics , Spectroscopy of Nano-Materials and CNTs, Quantum Chemistry & Bio- Physics , Magnetic Material, Solar Photovoltaic's.	M.Se Physics / M.Tech in appropriate branch of Engineering or With 60% aggregate marks or Equivalent CPI (%%% or Equivalent for SC/ST Candidates).
MNMG01	School of Management Studies	Marketing Human Resource, Finance, Systems Management, Strategic Management, Operations Management, Operations Management, International Business.	Master Degree in Management / Technology/ Engineering/ Economics/ Commerce/ Science / Computer Applications / Social Science with minimum of 60% marks or equivalent (55% or Equivalent for SC/ST candidates) or Bachelor degree in Engineering with a minimum of 75% marks or equivalent CPI (70% or equivalent for SC/ST candidates)
MNGI01	GIS Cell	Geoinformatics (Core and Application)	M.Tech or equivalent in GIS & Remote Sensing/ Civil Engineering/ Computer Science & Engineering,/ Information Technology/ Agricultural Engineering/ Mining Engineering or M.Sc. degree in GIS & Remote Sensing / Applied Geology/ Geophysical / Geography/ Environmental Science/ Computer Science or degree in Master of Computer Application.

Where the eligibility qualification is Master's degree in Science or Commerce or Economics or English or any Subject of Humanities or Life Science or Management qualifying NET is must for getting Institute fellowship as per Letter F.No. 25-2/2010-TS.II, dated 30.09.2010 and subsequent modification which may be issued by MHRD from time to time.

Important Note:

- **Only disservice candidates with B.Tech/MCA or equivalent degree with 75% aggregate marks or equivalent (70% or equivalent for SC/ST candidates), may be considered for admission to Ph.D. programmes as mentioned above.**
- **Number o seats in each department will depend upon the availability of Supervisor in the department.**
- **Preference will be given to SC/ST candidates otherwise found eligible.**

28. National Institute of Technology Calicut, Calicut 673 601 – CL

M.Tech. Degree in Engineering/Technology in the appropriate branch of study with first class or minimum 60% marks (CGPA 6.5/10) in aggregate of all semesters [For SC/ST candidates, the minimum mark is 55% (CGPA 6.0/10)].
Candidates shall be required to have passed the **four-year regular full time** B.E./B.Tech. Degree in an appropriate branch with minimum 60% marks (CGPA 6.5/10) in aggregate in the qualifying examination. [For SC/ST candidates 55% marks (CGPA 6.0/10)].
Candidates under lateral entry should have passed the three year diploma in engineering with minimum 60% marks [For SC/ST candidates 55% marks (CGPA 6.0/10)].

Code	Department	Fields of specialization	* Minimum Qualification-Masters Degree in
CLCE01	Civil Engineering	Structural Engineering;	Structural Engineering.
		Offshore Structures	Offshore Structures / Structural Engineering / Ocean Engineering / Coastal Engineering
		Traffic & Transportation Planning.	Transportation Engineering/Highway Engineering/Traffic & Transportation Planning/Urban Engineering.
		Geotechnical Engineering	Geotechnical Engineering / Environmental Geotechnology
		Water Resources Engineering	Water Resources Engineering/ Environmental Geotechnology
		Environmental Engineering	Environmental Engineering/ Environmental Geotechnology
		Building Sciences	Building Technology/Construction Engineering/ Construction and Management/Structural Engineering
		Town Planning.	Town Planning /Urban Design/Architecture
CLEE01	Electrical Engineering	Instrumentation and Control Systems	Electrical Engineering/ Power Systems / Energy Systems / Energetic / Industrial Power / Industrial Power & Automation / Power Electronics / Control Systems / Instrumentation and Control Systems / Instrumentation Engineering / Applied Electronics and Instrumentation / Biomedical Engineering / Computer Controlled Industrial Power
		Power and Energy Systems	
		Power Electronics & Industrial Drives	
		Biomedical Instrumentation and Signal Processing	
CLEC01	Electronics and Communication Engineering	Communication & Networking/ Signal Processing Micro electronics & VLSI	Electronics / Electronics Design & Technology / Electrical Communication / Microelectronics & VLSI Design / Electronics & Communication / Telecommunication / Signal Processing /Computer Science & Engineering / Electronics & Instrumentation/ Electrical Engineering.
CLME01	Mechanical Engineering	Industrial Engineering and Management	Industrial Engineering and Management / Industrial Engineering/ Industrial Engineering and Operations Research / Manufacturing Technology / Production Engineering
		Thermal Sciences	Thermal Sciences/Energy Engineering / Energy Engineering & Management.
		Manufacturing Technology	Manufacturing Technology/Production Engineering.
		Energy Management	Thermal Sciences/Energy Engineering/Energy Engineering & Management
		Materials Science and Technology	Materials Science and Technology/ Manufacturing Technology / Production Engineering
		Mechanical Design	Mechanical Systems Design / Machine Design / Machine Dynamics

29. National Institute of Technology Karnataka, Surathkal 575 025 – SK

The relaxation is given for SC/ST candidates in the pre-qualifying degree (post graduate degree) marks/CGPA required for Ph.D. programs. They need to have a minimum of 50% marks or CGPA of 5.0 as against 55% marks and CGPA of 5.5 for general candidates.

Code	Department	Fields of specialization	Minimum Qualification
SKAM01	Applied Mechanics and Hydraulics	Marine structures/Coastal Engineering/Ocean Engineering.	Master's degree in Civil/ Marine/ Structures/ Ocean/ Offshore/ Coastal Geotechnical/Soil Mechanics/ Structural /Hydraulics/ Environmental/ Applied Mechanics/ Remote Sensing/GIS/ Geo-informatics.
SKAM02		Hydraulics Engineering /Water Resources Engineering	Master's degree in Civil/ Hydraulics /Water Water Resources/ Aerospace / Agricultural/ Ocean/ Environmental/ Coastal Engineering/ Remote Sensing/GIS.
SKAM03		Remote Sensing & GIS	Master's degree in Civil/ Hydraulics /Water Resources/ Aerospace/ Agricultural/ Ocean/ Environmental/ Coastal Engineering/ Remote Sensing/GIS.
SKCE01	Civil Engineering	Mechanics of Fibre Reinforced Composite Laminates; (Structural Engineering) Mathematical Modeling: Application of Analytical and Numerical Methods for Stress, Thermal, Thermo-Mechanical, Free Vibration and Stability Analysis of Laminated Composite and Sandwich Structures; Non-linear FEM Analysis: Study of Spatial Structures, Bridges, Structural Optimization, Soil-structure Interaction, Structural Dynamics.	M.E./M.Tech./M.Sc.(Engineering) in Structural Engineering or related areas of any recognized Indian Universities.
SKCE02		Soil Engineering, Soil Behaviour, Soil/Ground Improvement Techniques, Earth Pressures, Anchors, Pile Foundations, Stability of Slopes, Environmental Geotechnics, Soil Dynamics, Rock Mechanics, Blasting (using both Experimental and Analytical Approaches such as FEM).	M.E./M.Tech./ M.Sc. (Engineering) in Geotechnical Engineering (Soil Mechanics and foundation Engineering) or any other related fields such as structural Engineering, Mining Engineering, Environmental Engineering, Transportation Engineering, Construction Engineering, Coastal Engineering, Soil Physics and Soil Chemistry from any recognized Indian Universities.
SKCE03		Transportation Engineering, Earthquake Engineering, Environmental Engineering.	M.E./M.Tech./M.Sc. (Engineering) in the relevant Civil Engineering disciplines or related areas of any recognized Indian Universities.
SKCH01	Chemical Engineering	Process Development, Particulate System, Biotechnology, Environmental Engineering, Transfer Operations, Industrial Biotechnology	Master's Degree including Master's degree by Research from a recognized University in Chemical Engineering /Biotechnology/Micro-biology/ Biochemistry.
SKCS01	Computer Engineering	Software Engineering, Communication Network, Distributed Computing, Work Flow Software, Grid Computing, Autonomic Computing, Data Mining, Data Warehouse, Security of Information, Bio-informatics, Bio- informatics	Master's Degree including Master's Degree by Research from a Recognized University; M.E./M.Tech /M.Sc. (Engineering) in Computer/ IT/E & C / Software Engineering / Networks, with B. E. / B. Tech. / B. Sc. (Engineering) in Computer/ E&C/IT/E&E
SKEC01	Electronics and Communication Engineering	Communication/VLSI Design / Signal Processing	Master's Degree including Master's Degree by Research from a Recognized University Master's Degree in Engineering / Technology or Master's Degree by Research in Engineering /Technology in the field of specialization (with a CGPA of at least 5.5 in the 0-10 scale grading system or not less than 55% marks in the aggregate. In the case of SC/ST candidates these shall be a CGPA of 5.0 or 50% marks in qualifying examination – Master's Degree including Master's Degree by Research from a Recognized University)
SKEE01	Electrical and Electronics Engineering	Energy Systems, Power Electronics & Drives, High Voltage Engineering, Power Systems, Control Systems, Instrumentation Engineering	Master's Degree in Electrical Engineering (with a CGPA of at least 5.5 in the 0-10 scale grading system or not less than 55% marks in the aggregate. In the case of SC/ST candidates these shall be a CGPA of 5.0 or 50% marks in qualifying examination – Master's Degree including Master's Degree by Research from a recognized University)

Code	Department	Fields of specialization	Minimum Qualification
SKHS01	Humanities	Management, Economics, English (Comparative literature) and related disciplines	Master's Degree (with a CGPA of at least 5.5 in the 0-10 scale grading system or not less than 55% marks in the aggregate. In the case of SC/ST candidates these shall be a CGPA of 5.0 or 50% marks in qualifying examination from recognized University)
SKME01	Mechanical Engineering	Alternative Fuels, Heat Transfer, Advanced Manufacturing , Mechatronics, IC Engine, Refrigeration and Air Conditioning, Fluid Dynamics, Fracture Mechanics and Fatigue, Machine Dynamics and Vibration, Advance Materials, MEMS, Robotics and Control, Stress Analysis, FEM, Renewable Energy, Tribology	M.E./M.Tech./M.Sc. (Enineering) in the relevant field (with a CGPA of at least 5.5 in the 0-10 scale grading system or not less than 55% marks in the aggregate. In the case of SC/ST candidates these shall be a CGPA of 5.0 or 50% marks in qualifying examination – Master's Degree including Master's degree by Research from a recognized University)
SKMI01	Mining Engineering	Rock Mechanics and Ground Control, Drilling and Blasting, Mine Planning, Environmental Management	Master's degree in Mining Engineering or other related fields such as Geo-technical Engineering, Remote Sensing/GIS, Geoinformatics, Applied Geology and Geophysics or related areas (with a CGPA of at least 5.5 in the 0-10 scale grading system or not less than 55% marks in the aggregate. In the case of SC/ST candidates these shall be a CGPA of 5.0 or 50% marks in qualifying examination – Master's Degree including Master's degree by Research from a recognized University)
SKMT01	Metallurgical and Materials Engineering	Mechanical processes, Chemical processes and materials, Physical Metallurgy, Extractive Metallurgy, Foundry, Welding, Metal Forming, Corrosion, Powder Metallurgy and Transport Phenomena	M.E./M.Tech./M.Sc. (Engineering.) in the relevant field (with a CGPA of at least 5.5 in the 0-10 scale grading system or not less than 55% marks in the aggregate. In the case of SC/ST candidates these shall be a CGPA of 5.0 or 50% marks in qualifying examination – Master's Degree including Master's degree by Research from a recognized University)

30. National Institute of Technology Rourkela, Rourkela 769008 – RK

Minimum eligibility is Masters degree in Engineering Technology with at least 60% marks in aggregate.

Code	Department	Fields of specialization	Minimum Qualification
RKCM01	Ceramic Engineering	Ceramic Engineering	B.E./ B.Tech./ M.Sc. in relevant discipline with minimum 65% marks in aggregate or 7.0CGPA. Or M.E./M.Tech. in relevant discipline with at least 60 percent marks in aggregate (or 6.5 CGPA) at both B.Tech./(or M.Sc.) and M.Tech. levels.
RKCH01	Chemical Engineering	Chemical Engineering	-do-
RKEC01	Electronics and Communication Engineering	Telematics & Signal Processing	-do-
RKEC02		VLSI Design & Embedded System	
RKEE01	Electrical Engineering	Power Control & Drives	-do-
RKME01	Mechanical Engineering	Experimental Stress Analysis	M.E./M.Tech in Mechanical Engineering With at least 60% marks in aggregate.
RKME02		Vibration	
RKME03		Plastic Deformations of Metals	
RKME04		Heat Transfer	
RKME05		Cryogenics	
RKME06		Finite Element Techniques	
RKME07		Computer Aided Design	
RKME08		Computer-aided Manufacturing	
RKME09		Automation & Robotics	
RKMM01	Metallurgical and Materials Engineering	Metallurgy & Materials Engineering.	M.E./M.Tech. in Material Engineering/ Science or Met. Engineering or Mechanical Engineering. or Chemical Engineering or Ceramic Engineering With 60% marks in aggregate.
RKMI01	Mining Engineering	Mining Engineering	B.E./ B.Tech. / M.Sc. in relevant discipline with minimum 65% marks in aggregate or 7.0CGPA. Or M.E./ M.Tech. in relevant discipline with at least 60 percent marks in aggregate (or 6.5 CGPA) at both B.Tech./(or M.Sc.) and M.Tech. levels.

31. National Institute of Technology, Tiruchirappali- 620 015 - TR

Minimum Qualifications: Master's Degree in Engineering / Technology in appropriate branch with first class or minimum 60% marks (CGPA 6.5) or equivalent in UG or PG. for SC/ST candidates a mere pass in UG and PG is sufficient.

Code	Department	Fields of Specialization	Minimum Qualification
TREE01	Electrical and Electronics Engineering	Power Systems, Electrical Machines and Power Electronics, VLSI, Control Systems and Computer Science.	Master's degree in Engineering/ Technology in appropriate branch with first class or minimum 60% marks (CGPA 6.5) or equivalent in UG or PG. For SC/ST candidates, a mere pass in UG and PG is sufficient.
TRMT01	Metallurgical & Materials Engineering	Processing of Newer Materials, Metal Forming, Powder Metallurgy, Corrosion Engineering, Welding Engineering, Process Modeling, and Fracture Mechanics, Surface Engineering, Geo Materials, Nano Materials, Process Metallurgy, Quality management	Master's degree in Engineering/ Technology in appropriate branch with first class or minimum 60% marks (CGPA 6.5) or equivalent in UG or PG. For SC/ST candidates, a mere pass in UG and PG is sufficient. Regular Admission to Ph.D. We consider M.Sc. M.Tech also.
TRPE01	Production Engineering	**Manufacturing**: Mechatronics/robotics, Micromachining, Surface Engineering, Tribology, Intelligent Manufacturing, Composite Materials Processing, Advanced Welding, Non-traditional machining, Rapid Manufacturing. **Industrial Engineering:** Simulation, Supply Chain Management, Lean manufacturing, Quality Engineering, Project Management, Industrial Engineering Management, Data Analysis & Management, Optimization Techniques, Resource Management.	Master's degree in Engineering/ Technology in appropriate branch with first class or minimum 60% marks (CGPA 6.5) or equivalent in UG or PG. For SC/ST candidates, a mere pass in UG and PG is sufficient.
TRCL01	Chemical Engineering	Transfer Operation, Process Control. Bio-Chemical Engineering/Bio-Technology, Reaction Engineering, Particle Technology, Energy and Environmental Engineering, Thermodynamics, Computer Aided Design, Process Systems Engineering, Energy Engineering, Electrochemical Engineering, Polymer Engineering.	Master's degree in Engineering/ Technology in appropriate branch with first class or minimum 60% marks (CGPA 6.5) or equivalent in UG or PG. For SC/ST candidates, a mere pass in UG and PG is sufficient.
TRCV01	Civil Engineering	Transportation Engineering & Management, Structural Engineering, Environmental Engineering, Geotechnical Engineering, GIS.	Master's degree in Engineering/ Technology in appropriate branch with first class or minimum 60% marks (CGPA 6.5) or equivalent in UG or PG. For SC/ST candidates, a mere pass in UG and PG is sufficient.
TRCS01	Computer Science & Engineering	Computer Networks, Mobile Communication, Image Processing, Data Mining, Grid and Cloud Computing, Digital Forensics, Network Security, Wireless Networks.	Master's degree in Engineering/ Technology in appropriate branch with first class or minimum 60% marks (CGPA 6.5) or equivalent in UG or PG. For SC/ST candidates, a mere pass in UG and PG is sufficient.
TRIC01	Instrumentation & Control	Mathematical Control Theory, Algorithms, Computational Complexity, Networked Control Systems, Mobile Robotics-UGVs and UAVs Estimation Theory, Kalman Filtering, Particle Filters, PIDS and Fractional Order Controllers, MEMS, Smart Material and Structures, Instrumentation Systems Control , Systems Design, Intelligent Control, Process Control, System Identification and Multirate Feedback Control, Biomedical Systems.	Master's degree in Engineering/ Technology in appropriate branch with first class or minimum 60% marks (CGPA 6.5) or equivalent in UG or PG. For SC/ST candidates, a mere pass in UG and PG is sufficient.
TRME01	Mechanical Engineering	Thermal Science, Industrial Safety Design, Machine Design.	Master's degree in Engineering/ Technology in appropriate branch with first class or minimum 60% marks (CGPA 6.5) or equivalent in UG or PG. For SC/ST candidates, a mere pass in UG and PG is sufficient.

32. National Institute of Technology Warangal, Warangal 506 004 - WR

Minimum qualification: First class Master's degree in the appropriate branch with a minimum of 60% marks in aggregate. In case of SC/ST/PD Candidates, the Minimum aggregate marks is 55%

Code	Department	Fields of specialization	Minimum Qualification
WRCH01	Chemical Engineering	Fluidization/Modeling & Simulation/Heat Transfer and Two- Phase Flow/ Biochemical Engineering/Non-Linear Control.	Master's degree in Chemical Engineering. or its equivalent.
WRCE01	Civil Engineering	Geotechnical Engineering.	Master's degree in Geo-technical Engineering/ Soil Mechanics or equivalent.
		Engineering Structures.	Master's degree in Structural Engineering or equivalent.
		Transportation Engineering.	Master's degree in Transportation Engineering/ Highway Engineering or equivalent.
		Water Resources & Environmental Engineering.	Master's degree in Water Resource Engineering/ Environmental Engineering or equivalent.
WRME01	Mechanical Engineering	Thermal Engineering / Manufacturing Engineering. /Design Engineering.	Master's degree in Mechanical Engineering in the concerned specialization.
WRMH01	Mathematics and Humanities	Fluid Mechanics / Numerical Analysis.	M.Sc./ M.A. in Applied Mathematics / Mathematics.

33. PSG College of Technology, Coimbatore 641004 -PS

Code	Department	Fields of specialization	Minimum Qualification
PSME01	Mechanical Engineering	Machine Design, Finite Element Analysis, CAD/CAM, Automobile Engineering, Composite materials, Rapid prototyping, Heat Power Engineering, Fluid Power Control & Automation, Energy Engineering, Simulation, Operations Management, Metal Forming, Casting, Welding, Injection Molding, Precision Engineering Tolerance Engineering, Computer Aided Engineering, Smart Systems, Vibration & Noise Engineering, Product Life Cycle Management, Reliability Engineering, Machine Tool Design, Safety Engineering, Innovation & Creativity, Value Engineering, Concurrent Engineering, Pneumatics, Manufacturing, Instrumentation, DFMA, TPM, Tribology, Ergonomics & Industrial Design, Refrigeration & Air Conditioning, Nano Technology.	A Master's degree in Mechanical Engineering/ Production Engineering
PSPE01	Production Engineering	CAD/CAM, Laser Material Processing, Fluid Power Control and Automation, Industrial Engineering, Value Engineering, Systems Engineering, Total Quality Management, Agile Manufacturing, Innovative Management , Metal Forming, Concurrent Engineering, Manufacturing Systems Analysis, Virtual Manufacturing, Lean Manufacturing, Precision Manufacturing, Product Data Management, Product Life Cycle Management, Product Development, Metl Casting Injection Molding, Tool Design (Jigs & Fixtures), Wilding.	A Master's degree in Mechanical Engineering / Production Engineering.

34. Smart Ashok Technological Institute, Vidisha 464001– SV

Code	Department	Fields of specialization	Minimum Qualification
SVCE01	Civil Engineering	Building Technology & Materials, Retrofixing of Buildings, Sub Surface Technology, Transportation Engineering, Environmental Engineering, Structures, Fluid Mechanics.	Master's degree (ME/M.Tech.) in Civil Engineering with first division or equivalent.
SVCS01	Computer Science and Engineering	Data Mining, Image Processing, Ad-hoc Network, Mobile Computing, Computer Network, Security.	Master's (ME/M.Tech.) in Computer Science & Engineering or related areas with first division or equivalent.
SVIT01	Information Technology	Data Mining, Image Processing, Ad-hoc Network, Mobile Computing, Image Processing, Computer Network, Security.	Master's degree (ME/ M. Tech.) in Computer Science & Engineering, Information technology or related areas with first division or equivalent.
SVEE01	Electrical Engineering	Power Electronics, Drives.	Master's degree (ME/M. Tech.) in Electrical Engineering with first division or equivalent.
SVME 01	Mechanical Engineering	Ergonomics, TQM, SQC, Mechatronics, Production and Operation Management, Refrigeration & Air conditioning, Quality, Productivity, Six Sigma, SQC.	Master's degree (ME/M.Tech.) in Mechanical Engineering with first division or equivalent.

35. Shri G.S. Institute of Technology & Science, Indore 452003 – GS

Code	Department	Fields of specialization	Minimum Qualification
GSCE01	Civil Engineering	Structural Engineering, Transportation Engineering, Environmental Engineering, Water Resource Engineering, Geotechnical Engineering, Remote Sensing	
GSEE01	Electrical Engineering		
GSEC01	Electronics & Communication Engineering		
GSCS01	Computer Science & Engineering		
GSME01	Mechanical Engineering		
GSIP01	Industrial & Production Engineering		

36. Shri Guru Govind Singh Institute of Engineering & Technology, Nanded 431 606 – SG

Code	Department	Fields of specialization	Minimum Qualification
SGEC01	Electronics & Communication Engineering	VLSI and Embedded Systems	M.E./M.Tech degree in relevant discipline with minimum 55% marks or equivalent CGPA.
SGEC02		Signal Processing: Speech, Biomedical Signals	
SGEC03		Image and Video Processing	
SGEC04		Pattern Recognition	
SGIN01	Instrumentation & Control	**Measurement and Instrumentation:** Industrial Instrumentation, Process Instrumentation and Control, Recent trends and Applications in Measurement and Instrumentation, Intelligent Instrumentation, Biomedical Instrumentation and Applications, Biomedical Signal Processing and Applications Advanced Sensors and MEMS Devices.	ME/M.Tech or Equivalent degree in Instrumentation, Instrumentation & Control, Electrical Engineering, Electronics, Electronics & Telecommunication, Electronics & Instrumentation, Electrical & Electronics Engineering, Biomedical Instrumentation **with minimum 55% marks or equivalent CGPA**.
SGIN02		**Control System:** Linear System Theory, Nonlinear Systems, Process Identification and Control, Robust and optimal control, sliding Mode control and Applications, Adaptive Control Computer Controlled Systems including Process Control, Large Scale System Modeling and Control, Nuclear Reactor Control, Neural and Fuzzy based Control, Intelligent Control, and Evolutionary Approaches for Control System	
SGIN03		**Digital Signal and Image Processing:** Signal Processing, Speech Processing, Speaker Identification and Recognition, Image Processing and Computer Vision, Biometrics and Applications, Wavelets and Applications in Real Time Processing of Signals.	

Code	Department	Fields of specialization	Minimum Qualification
SGPE01	Production Engineering	Micro-Manufacturing	M.E./M.Tech. degree in Production, Mechanical or equivalent with minimum 55% marks or equivalent CGPA.
SGPE02		Advanced Manufacturing Technologies	
SGPE03		Modeling and Analysis of Manufacturing Processes: Machining, Casting, Welding and Metal Forming.	
SGPE04		CAE for Composites	M.E./M.Tech. degree in Production, Mechanical or with minimum 55% marks or equivalent CGPA.
SGPE05		Robust Design and Simulation Analysis for Products and Processes	M.E./M.Tech. degree in Production, Mechanical or equivalent with minimum 55% marks or equivalent CGPA.
SGPE06		Production/ Operations Management and PLM	M.E./M.Tech. degree in Production, Mechanical or equivalent with minimum 55% marks or equivalent CGPA.
SGPE07		Tool Condition Monitoring	
SGCE01	Civil Engineering	Hydraulics and / Water Resources Engineering	Master's degree in Hydraulics and / or Water Resources / Environmental Engineering or equivalent degree with **minimum 55% marks or equivalent CGPA.**
SGCE02		Environmental Engineering	Master's degree in Hydraulics and / or Water Resources / Environmental Engineering or equivalent with **minimum 55% marks or equivalent CGPA.**
SGCE03		Geotechnical Engineering	Master's degree in Hydraulics and / or Water Resources / Environmental Engineering or equivalent degree with **minimum 55% marks or equivalent CGPA.**
SGCE04		Structural Engineering	
SGME01	Mechanical Engineering	Micro Manufacturing	M.E./ M.Tech. degree in Mechanical / Production Engineering or equivalent with **minimum 55% marks or equivalent CGPA**.
SGME02		Advanced Manufacturing Technologies	
SGME03		Tribological Characterization	
SGME04		Quality and Reliability	
SGME05		Production and Operation Management	
SGME06		Manufacturing Process Modeling and Analysis: Machining, Casting, Welding and Metal Forming	
SGME07		Thermo-Structural Analysis, Design and Analysis of Composites	

37. The National Institute of Engineering, Mysore 570 008 – NM

Code	Department	Minimum Qualification
NMCE01	Civil Engineering	Master's degree in Civil Engineering
NMEE01	Electrical Engineering	Master's degree in Electrical Engineering
NMIE01	Industrial Engineering	A Master's degree in Mechanical/Production Engineering
NMP01	Production	A Master's degree in Mechanical/Production Engineering
NMCS01	Computer Science & Engineering	Master's degree in Computer Science/ IS
NMIT01	Information Technology	Master's degree in Computer Science/ IS

38. Thiagarajar College of Engineering, Madurai 625 015 – TM

Code	Department	Fields of specialization	Minimum Qualification
TMCE01	Civil Engineering	Structural Engineering, Environmental Engineering, Hydrology and Water Resources Management, Geotechnical Engineering, Transportation Engineering, Pollution control, Construction materials, Repair & Rehabilitation.	As per the affiliating University norms. • M.E./ M.Tech. /M.S. (By Research) in the relevant branch of Engineering & Technology and • a minimum of 55% marks or CGPA of 5.5 on a ten point scale in the qualifying exam (50% marks or CGPA of 5.0 on a ten point scale for SC/ST candidates)
TMEE01	Electrical Engineering	Power Systems, Soft computing, Renewable Energy Resources, Energy Conservation and Management, Power Electronics and Drives, Electrical Machines, Optimisation Techniques, Smart Grid, Distributed Generation Systems, Special Machines, Control Systems, FACTS deices and controllers, AI and Expert Systems Applications.	
TMME01	Mechanical Engineering	Thermal Engineering, Computational Fluid Dynamics, Design Engineering, Composite Materials, Automation, CAD/CAM, CIM, Machine Vision, Mechatronics, Rapid Prototyping, Quality Engineering, Reliability Engineering, Industrial Engineering, Manufacturing Management, Logistics and Supply Chain Management, Lean/Agile Manufacturing.	
TMEC01	Electronics & Communication Engineering	Wireless Communication, Digital Signal Processing, RF Circuits and Systems, Antennas., RFMEMS, Image Processing, Remote Sensing and GIS, VLSI Design, Embedded Systems, Sensors and Instrumentation, Wireless Networks, Medical Electronics.	
TMCS01	Computer Science & Engineering	Network Security, Data Mining, Artificial Intelligence, Multicore Architecture, Parallel Processing, Computer Networks, Knowledge Engineering, Machine Learning, Software Testing, Software Quality and Reliability, Grid Computing, Internet Technology, Compliers, Multimedia, Computer Vision, Biometrics, Multimedia and Graphics, Computer Algorithms.	

39. University Visveswaraya College of Engineering, Bangaluru 560 056 - UV

Code	Department	Fields of specialization	Minimum Qualification
UVCE01	Civil Engineering	Structural Engineering, Geotechnical Engineering, Environmental Engineering, Construction Technology; Highway Engineering, Water Resources Engineering, Pre-stressed Concrete.	A master degree in Civil Engineering or any of the branches of Civil Engineering or equivalent fields with minimum 60% marks.

40. Veer Surendra Sai University of Technology, Burla – VB

Code	Department	Fields of specialization	Minimum Qualification
VBCE01	Civil Engineering	Geotechnical Engineering, Structural Engineering, Water Resources Engineering, Environmental Engineering.	M.E./M.Tech with minimum of 6.75 CGPA in 10 point scale (or 60% or more in aggregate) in Master's level and minimum of 6.75 CGPA (or 60% mark in aggregate) at the Bachelor's level.
VBEE01	Electrical Engineering	Power System Engineering, Power System & Devices, Control System Engineering	
VBEC01	Electronics & Communication Engineering	Signal Processing, Image Processing, Electromagnetics & Microstrip Antenna, Computational Intelligence.	
VBME01	Mechanical Engineering	Machine Design & Analysis, Production Engineering, Thermal Engineering.	
VBPE01	Production Engineering	Robotics, Non-Traditional Machining, Manufacturing Systems.	

41. Visvesvaraya National Institute of Technology, Nagpur 440 011 - VR

Code	Department	Fields of specialization	Minimum Qualification
VREE01	Electrical Engineering	Power system Stability/ Operation /Protection, Power Electronics, HVDC/ FACTS, Electric Drives/ Renewable Energy Systems.	First Class Master' degree in Electrical Engineering (Power Systems / Power Electronics / Electric Drives / Control and Instrumentation) **Essential:** Candidate should posses qualified GATE Score in past.
VRMT01	Metallurgical Engineering	1. Alloy Development 2. Corrosion & High temperature oxidation 3. Development of: a) Ceramic & glasses b) Polymeric materials c) Composites 4. Fatigue and fracture behaviour of materials 5. High temperature deformation. 6. Wear behaviour of engineering materials 7. Welding metallurgy	M.Tech./ M.E. (Metallurgical Engineering. OR Materials Science & Engineering OR Mechanical Engineering OR Polymer Engineering) **Essential:** Candidate should posses qualified GATE Score in past.

42. Walchand College of Engineering, Sangli 416 415 – WS

Code	Department	Fields of specialization	Minimum Qualification
WSCE01	Civil Engineering	**Civil – Environmental Engineering:** Water and Wastewater Treatment, Modeling of Environmental Systems, Solid Waste Management, Air Pollution, Constructed Wetlands Building Materials and Technologies, Energy Efficiency in Building, Civil Structural Engineering: Earthquake Engineering, Finite Element Analysis, Structural dynamics, Concrete technology	As per Shivaji University Kolhapur Norms
WSME01	Mechanical Engineering	Heat Power, Thermal Engineering, Cryogenics, Production Engineering Mechatronics, Micromachining, Manufacturing, Design Engineering, Condition Monitoring	
WSEE01	Electrical Engineering	HV Processing, Control Systems/Power Systems, Power Electronics, Electrical Drives, Electrical Machines, Power Electronics.	
WSEC01	Electronics & Communication Engineering	Signal Processing, Communication Engineering, VLSI Design, Image Processing, Electronic System Design, Control Systems, Communication Engineering, Electronic System Design, Image Processing Mobile Communication, Sensor Networks, Image Processing.	
WSCS01	Computer Science & Engineering	Artificial Intelligence, Pattern Recognition, Databases, Data Mining, Networking, Image Processing, Information Security, High Performance Computing, Cloud Computing.	

43. S.V. National Institute of Technology, Surat - 395 007 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
SSCE01	Civil Engineering	Environmental Engineering, Water Resources Engineering, Urban Planning, Transportation Engineering and Planning, Structural Engineering, Soil Mechanics & Foundation Engineering.	Masters degree in relevant area of Engineering Admission as per the norms available on the institute's website: www.svnit.ac.in
SSME01	Mechanical Engineering	Design and Dynamics, Thermal and Fluid Engineering, Manufacturing and Industrial Engineering.	Masters degree in engineering with specialization in Thermal and Fluid Engineering/Manufacturing and Industrial Engineering/Design and Dynamics/Robotics and Mechatronics/Energy Systems Engineering / Automobile Engineering/Aeronautical Engineering/ Cryogenics/ CAD/CAM/CIM/Production/ Tribology/Turbo Machines Admission as per the norms available on the institute's website: www.svnit.ac.in
SSEE01	Electrical Engineering	Power Electronics & Electrical Drives, Electrical Power Systems, Control and Instrumentation, Energy Systems.	Masters degree in relevant area of engineering Admission as per the norms available on the institute's website: www.svnit.ac.in
SSEC01	Electronic & Communication Engineering	Communication and Networking: Wireless mobile communication, CDMA, multiuser detection, MIMO, OFDM, cooperative Communications. Communication networking: modeling, analysis, optimization and control of resource allocation in wireline and wireless networks; Scheduling in networks; quality of service in heterogeneous networks; cross-layer design in Wireless networks; energy efficient protocols. Wireless sensor networks: Self organization, and distributed signal processing, system architectures for various applications, distributed computing algorithms for sensor networks. Communication protocols-specification and verification, Al applications to communication networks and their management, mobile agents. Multimedia communication. Photonics: Fibre Optics communication, DWDM networks, Integrated optics, MOEMS; Fiber Bragg grating Sensors, Bio Photonics and bio sensore. Signal Processing: Wavelets: application to data transmission, signal detection and denoising. Multirate signal processing, filter bank design. Statistical signal processing; signal detection and estimation, Biomedical signal processing. Processing of biomedical signals using nonlinear dynamical techniques. Abnormality detection in ECG and EEG signals. Connectivity study of networks in the brain.	ME/M.Tech. or equivalent degree in Electronics and Communication, Telecommunication, Electronics, Biomedical Engineering Admission as per the norms available on the institute's website: www.svnit.ac.in
SSCS01	Computer Engineering	Information Security and Privacy, Software Requirements Specification using Ontologies. Computer Vision/Image Processing Machine Learning/Soft Computing Wireless Network Automata/Compiler	Masters degree in Computer Engineering or allied fields Admission as per the norms available on the institute's website: www.svnit.ac.in
SSCH01	Chemical Engineering	Catalysis in refining & petrochemicals processes, Catalysis in biomass conversion, Befouls, Nanofuels, Wastewater treatments, Membrane separations, Metal recovery methods, Multiphase flow, Syntheses and applications of metal/metal oxide nanoparticles, Crystallization processes, Energy and environment management, CFD in Chemical Engineering, Polymer nanotechnology and polymer nanocomposites.	Masters degree in Chemical Engineering or allied fields Admission as per the norms available on the institute's website: www.svnit.ac.in

44. Malaviya National Institute of Technology, Jaipur - 302 017 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
MJCH01	Chemical Engineering	Will be notified later	Will be notified later
MJCE01	Civil Engineering	Will be notified later	Will be notified later
MJEE01	Electrical Engineering	Will be notified later	Will be notified later
MJME01	Mechanical Engineering	Will be notified later	Will be notified later
MJMT01	Metallurgical & Materials	Will be notified later	Will be notified later
MJEC01	Electronic & Communication Engineering	Will be notified later	Will be notified later
MJCP01	Computer Engineering	Will be notified later	Will be notified later

45. National Institute of Technology, Durgapur (West Bengal) - 713 209 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
NDBT01	Biotechnology	Will be notified later	Will be notified later
NDCH01	Chemical Engineering	Will be notified later	Will be notified later
NDCE01	Civil Engineering	Will be notified later	Will be notified later
NDCS01	Computer Science & Engineering	Will be notified later	Will be notified later
NDEC01	Electronic & Communication Engineering	Will be notified later	Will be notified later
NDEE01	Electrical Engineering	Will be notified later	Will be notified later
NDME01	Mechanical Engineering	Will be notified later	Will be notified later
NDMT01	Metallurgical & Materials Engineering	Will be notified later	Will be notified later

46. National Institute of Technology, Silchar (Assam) - 788010 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
NSCE01	Civil Engineering	➢ Structural Engineering ➢ Water Resource Engineering ➢ Earthquake Engineering ➢ Geotechnical Engineering ➢ Environmental Engineering ➢ Transportation Engineering	(i) M.E./M.Tech. or equivalent in an appropriate area with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60% of marks). For SC/ST candidates, a minimum CPI of 6.0 (on a 10 point scale) or equivalent (55% of marks). (ii) B.E./B.Tech. with an excellent academic record and with a CPI of at least 8.0 (on 10 point scale) or equivalent (75% of marks). For graduate from IITs/NITs, the minimum CPI requirement is 7.0 (on 10 point scale). For SC/ST candidates, there is a relaxation of 0.5 CPI or 5% of marks.
NSCS01	Computer Science & Engineering	➢ Image Processing ➢ Speech Processing ➢ NLP ➢ Soft Computing Techniques and Applications ➢ Machine Intelligence	(i)M.E./M.Tech. or equivalent in an appropriate area with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60% of marks). For SC/ST candidates, a minimum CPI of 6.0 (on a 10 point scale) or equivalent (55% of marks). (ii) B.E./B.Tech. with an excellent academic record and with a CPI of at least 8.0 (on 10 point scale) or equivalent (75% of marks). For graduate from IITs/NITs, the minimum CPI requirement is 7.0 (on 10 point scale). For SC/ST candidates, there is a relaxation of 0.5 CPI or 5% of marks.
NSEE01	Electrical Engineering	➢ Renewable Energy Generation & Control (Wind and Solar Photo-voltaic) ➢ Power Electronics ➢ Distributed Generation and Control ➢ Electrical Machine Drives ➢ Power Quality ➢ Power System Reliability ➢ Smart Grid ➢ Power System Planning, congestion management, Networking Pricing ➢ CNT and Carbon Nanowire Interconnects ➢ Application of Signal and Image Processing ➢ Grid Power and Bus Management ➢ Renewable Energy and its Applications ➢ Application of Microprocessor/Microcontroller ➢ Application of Soft-Computing in Engineering Applications ➢ Control Systems ➢ Fault detection and diagnosis of dynamical systems ➢ Industrial Automation ➢ Power system Economics ➢ Automatic Generation Control ➢ Image Processing ➢ Power System Protection	(i)M.E./M.Tech. or equivalent in an appropriate area with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60% of marks). For SC/ST candidates, a minimum CPI of 6.0 (on a 10 point scale) or equivalent (55% of marks). (ii) B.E./B.Tech. with an excellent academic record and with a CPI of at least 8.0 (on 10 point scale) or equivalent (75% of marks). For graduate from IITs/NITs, the minimum CPI requirement is 7.0 (on 10 point scale). For SC/ST candidates, there is a relaxation of 0.5 CPI or 5% of marks.
NSEC01	Electronic & Communication Engineering	➢ Microelectronics & VLSI Design ➢ Semiconductor Device, Modelling and Simulations ➢ MEMS-CMOS Co-design related to Spectrum Sensing in Wireless Technology ➢ Digital System Design ➢ Signal Processing ➢ Communication Engineering ➢ Power Electronics ➢ Ad-hoc & Sensor Networks	(i)M.E./M.Tech. or equivalent in an appropriate area with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60% of marks). For SC/ST candidates, a minimum CPI of 6.0 (on a 10 point scale) or equivalent (55% of marks). (ii) B.E./B.Tech. with an excellent academic record and with a CPI of at least 8.0 (on 10 point scale) or equivalent (75% of marks). For graduate from IITs/NITs, the minimum CPI requirement is 7.0 (on 10 point scale). For SC/ST candidates, there is a relaxation of 0.5 CPI or 5% of marks.
NSME01	Mechanical Engineering	Thermodynamics ,Heat Transfer ,Computational Heat Transfer ,Computational Fluid Dynamics ,Combustion Refrigeration & Air Conditioning ,Alternate Fuels ,Solar Energy ,Wind Turbines ,Hydraulic Turbines ,Spray Combustion , conventional Energy ,Tribology ,Fracture Mechanics ,Stress Analysis ,Vibration ,Micro-machining Advanced Manufacturing Processes ,Engineering Materials Virtual Manufacturing ,Composites	(i)M.E./M.Tech. or equivalent in an appropriate area with a minimum CPI of 6.5 (on a 10 point scale) or equivalent (60% of marks). For SC/ST candidates, a minimum CPI of 6.0 (on a 10 point scale) or equivalent (55% of marks). (ii) B.E./B.Tech. with an excellent academic record and with a CPI of at least 8.0 (on 10 point scale) or equivalent (75% of marks). For graduate from IITs/NITs, the minimum CPI requirement is 7.0 (on 10 point scale). For SC/ST candidates, there is a relaxation of 0.5 CPI or 5% of marks.

47. National Institute of Technology, Agartala (Tripura) - 799055 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
NAME01	Mechanical Engineering	Will be notified later	Will be notified later
NAEC01	Electronic & Communication Engineering	Will be notified later	Will be notified later
NAEE01	Electrical Engineering	Will be notified later	Will be notified later
NAPE01	Production Engineering	Will be notified later	Will be notified later
NACE01	Civil Engineering	Will be notified later	Will be notified later

48. PDPM Indian Institute of Information Technology Design & Manufacturing, Jabalpur (M.P.) - 482 005 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
PDCS01	Computer Science & Engineering	Softwear Engineering, Visul Cryptography, Big Data Analysis, I/O Efficient Alogrithms, Soft computing, Networking, Parallel Alogorthms, Image Reconstruction, Biometrics, Image Retrieval, Security, Cloud Computing, Robotics and Automation, Computer Aided Design	M.Tech./ME in Computer Science & Engineering or Information Technology or a similar discipline with minimum of 65 percent marks OR a CPA/CGPA of 6.5 (on the Scale of 10.00)
PDEC01	Electronic & Communication Engineering	Electromnics & VLSI Design: Nano-electronics, Low power system design, Device Simulation and Modeling, SRAM design Control, Instrumentation and Power system: Identification and Control of Processes, Mobile Robot, Power Electronics, Power System Protection Microwave and Communication Engineering, Electromagnetics, Antenna Design fabrication and testing, MMIC, Nanophotonics and Plasmonics, Wireless Communication, Fiber optic Comm system. Signal Processing: Multirate Signol Processing, Biomedical signal processing, Filter bank designing and application	M.Tech./ME in Electronics/ Electronics & Communication Engineering / Electrical Engineering or a similar discipline with minimum of 65 percent marks OR a CPA/CGPA of 6.5 (on the Scale of 10.00)
PDME01	Mechanical Engineering	Tribology, lubrication , fault diagnosis and condition monitoring of machines , Design , vibration, nonliner dynamics, Rapid Prototyping & Tooling, CNC machining, Geometry, Human Power energy Device, Nano Technologies in Manufecturing, Structural Dynamics, Smart Material and Structures , Aeroelasticity, Flappping Wing MAV , Thermal & fluid engineering , Product Design, Supply Chain Management, Operations Manegement, Mechatronics and Robotics,.	M.Tech./ME in Mechanical Engineering/ Production Engineering/ Industrial Engineering/ Production and Industrial Engineering or a similar discipline with minimum of 65 percent marks OR a CPA/CGPA of 6.5 (on the Scale of 10.00)_

49. Rajiv Gandhi Institute of Technology, Govt. Engineering College, Kottayam (Kerala) - 686 501 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
RGEE01	Electrical Engineering	Power and Renewable Energy System, Industrial Drives, Control Engg.	As per M. G. Univewrsity , Kottayam Keral Norms.
RGME01	Mechanical Engineering	----------	
RGCE01	Civil Engineering	Transformation Engg. Environmental Engg., Structural Engg. Geotechnical Engg., Water Resource Engg.	

50. Giani Zail Singh College of Engineering & Technology, Bathinda (Punjab) - 151 001 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
GZCS01	Computer Science & Engineering	Comp. N/ws, Computing, S/w Engg.	M. Tech., in the relevant discipline
GZME01	Mechanical Engineering	Manufacture (Investment Casting) Industrial Engg. (Supply Chain Management)	M. Tech (Mech./Production) M. Tech (Prod. Ind. Engg)
GZEE01	Electrical Engineering	Will be notified later	Will be notified later
GZCE01	Civil Engineering	Structural Engineering, Transportation Engineering	M. Tech. / M. E. (Civil)
GZTX01	Textile Engineering	Yarn Manufacturing, Fabric Manufacturing, (Woven Knitted & Non Woven), Technical Textile	M- Tech with first class with valid Gate score

51. Government College of Engineering, Amravati (Maharashtra) - 444 604 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
AMEE01	Electrical Engineering	Power System Operation and Control, Power System Protection and Stability, Deregulation, Electrical Network, Congestion Management, FACTs and Power re-routing, Application of Optimization and AI Techniques to Power System, Power Electronics, Distributed Generation	ME/M.Tech or equivalent degree in relevant branch **And** As per the affiliating University norms. i.e Sant Gadge Baba Amravati University
AMME01	Mechanical Engineering	Thermal Engineering, Production Engineering	ME/M.Tech or equivalent degree in relevant branch **And** As per the affiliating University norms. i.e Sant Gadge Baba Amravati University
AMCE01	Civil Engineering	**Geotechnical Engineering:** Foundations, Earth and Earth Retaining Structures, Ground Improvement Techniques, Geoenvironment Engineering, Earthquake Geotechnical Engineering	ME/M.Tech or equivalent degree in relevant branch **And** As per the affiliating University norms. i.e Sant Gadge Baba Amravati University
		Water resources and Environment Engineering: Open Channel Flows, Urban Water Distribution Systems, Environmental Hydraulics, Water Quality Modeling, Hydraulics, Water Quality Modeling, Hydraulic Structures	
		Structure Engineering: Structure Mechanics, FEM Techniques, RC and Prestressed concrete, Masonry Structures, Structure Dynamics, Non-Linear and Stochastic Dynamical Systems, Earthquake Engineering, Structural safety, Fracture Mechanics of Concrete, Materials in Civil Engineering, Structural Health Monitoring	

52. Netaji Subhas Institute of Technology, New Delhi - 110 078 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
NNEC01	Electronic & Communication Engineering	Will be notified later	Will be notified later
NNME01	Computer Engineering	Will be notified later	Will be notified later
NNIC01	Instrumentation & Control	Will be notified later	Will be notified later
NNMP01	Manufacturing Process & Automation	Will be notified later	Will be notified later
NNBT01	Biotechnology	Will be notified later	Will be notified later

53. Kamla Nehru Institute of Technology, Sultanpur (Uttar Pradesh) - 228 118 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
KSEE01	Electrical Engineering	Will be notified later	Will be notified later

54. Pondicherry Engineering College, Puducherry - 605 014 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
PYEC01	Electronic & Communication Engineering	Wireless Communications, Antennas, Electromagnetic Systems, Information and Wireless Security, Signal/Image Processing, Bio-Medical Engineering, Communication Networks, Optical Networks, and Embedded Digital System Design.	B.E./ B.Tech degree and M.E./ M.Tech degree in ECE/ Electronics/ Communication/ Other related specializations with an overall minimum aggregate of 60% marks (CGPA 6.5)or equivalent in the qualifying examination (M.E./ M.Tech.)
PYCS01	Computer Science & Engineering	Computer Networks, Software Engineering Software Architecture, Software Metrics and Testing Cloud Computing, Service Oriented Architecture and Computing, Database Systems, Data Mining and Warehousing, Language Technology and Ontology, Internet Technology, Distributed Systems, Digital Image Processing , Data Compression, Multimedia Technology, Artificial Intelligence and Fuzzy Logic, Information Security.	B.E./ B.Tech degree in Computer Science and Engineering/ Information Technology/ other related Specializations in Computer/ IT, and M.E./ M.Tech degree in Computer Science and Engineering/ Information Technology/other related Specializations in Computer/ IT, and an overall minimum aggregate of 60% marks (CGPA 6.5) or equivalent in the qualifying examination (M.E./ M.Tech.)
PYEE01	Electrical & Electronics Engineering	Power systems, power electronics, machines and electro magnetics, signal processing and control, artificial intelligence and digital control /estimation and renewable energy systems.	B.E./ B.Tech degree and M.E./ M.Tech degree in EEE/ Electrical/ other related specializations with an overall minimum aggregate of 60% marks (CGPA 6.5)or equivalent in the qualifying examination (M.E./ M.Tech.)
PYME01	Mechanical Engineering	Thermal Engineering, Design, Manufacturing Technology	B.E./ B.Tech degree and M.E./ M.Tech degree in Mechanical Engg / Other related specializations with an overall minimum aggregate of 60% marks (CGPA 6.5)or equivalent in the qualifying examination (M.E./ M.Tech.)
PYCE01	Civil Engineering	Structural Engg., Geotechnical Engineering, Environmental Engineering Transportation Engineering, Soil Mechanics & Foundation Engineering, Hydraulics & Water Resources Engineering	(a) M.E./M.Tech. degree in Civil Engineering with a minimumof 60% (CGPA 6.5)of marks or equivalent with specialization in: i) Structural Engineering ii) Geotechnical Engineering iii) Hydraulic & water Resource Engineering irrigation water Management / Ocean Engg. iv) Transportation Engineering v) Advanced surveying and Photogrammetry vi) Environmental Engineering / Environmental Technology /Environmental Management / Advanced ConstructionTechnology. vii) Geo informatics viii) Urban Engineering / Town & Country planning Viii) Environmental Bio - Technology / Bio-Technology / Bio-Chemical Engg./ Industrial Biotechnology

55. Sardar Patel College of Engineering, Mumbai (Maharashtra) - 400 058 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
SMCE01	Civil Engineering	Construction Management	M.E/M. Tech. in Construction Management, Transportation Engineering, Geotechnical Engineering, Hydraulic and Offshore Engineering, Environmental Engineering.
		Transportation Engineering	
		Hydraulics and Fluid Mechanics	
		Environmental Engineering	
		Structural Engineering	M.E./M .Tech in Structural Engineering, Geotechnical Engineering

56. Veermata Jijabai Technological Institute (VJTI), Mumbai (Maharashtra) - 148 106 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
VMCE01	Civil Engineering	Will be notified later	Will be notified later
VMEE01	Electrical Engineering	Will be notified later	Will be notified later
VMME01	Mechanical Engineering	Will be notified later	Will be notified later
VMEC01	Electronics Engineering	Will be notified later	Will be notified later
VMTX01	Textile Technology	Will be notified later	Will be notified later

57. Sant Longowal Institute of Engineering & Technology (Deemed University), Punjab - 148 106 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
SPME01	Mechanical Engineering	Will be notified later	Will be notified later
SPFE01	Food Engineering Technology	Will be notified later	Will be notified later
SPIE01	Electronics & Instrumentation Engineering	Will be notified later	Will be notified later
SPCT01	Chemical Technology	Will be notified later	Will be notified later

58. Indira Gandhi Institute of Technology, Sarang, (Odisha) - 759 146 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
IOCE01	Civil Engineering	Structural Engineering, Geotechnical Engineering, Transportation Engineering	First Division or 60% marks in B. Tech in Civil Engineering & M. Tech. in relevant field.
IOME01	Mechanical Engineering	Machin Design, Production Engineering, Thermal Engineering	First Division or 60% marks in B. Tech in Mechanical Engineering & M. Tech. in relevant field.
IOEE01	Electrical Engineering	M/c Drives & Power Electronics Power Systems Engineering Signal & Image Processing	First Division or 60% marks in B. Tech in Electrical Engineering & M. Tech. in relevant field.

59. Harcourt Butler Technological Institute, Kanpur (Uttar Pradesh) - 208 002 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
HKCE01	Civil Engineering	Structural Engineering, Water Resources Engineering, Environmental Engineering, Transportation Engineering,	Master's degree in Civil Engineering with First division or equivalent.
HKME01	Mechanical Engineering	Thermal Engineering, Manufacturing Technology, Design Engineering.	Master's degree in Mechanical Engineering with First division or equivalent.
HKEC01	Electronics & Communication Engineering	1. Optical Network, Optical Communication	M.Tech. Electronics Engineering with First division or equivalent.
		2. Digital Signal Processing, Digital Signal Processors, Computer Arithmetic, VLSI Design	M.Tech. Electronics Engineering/ Electronics & Communication/ Electronics & Instrumentation/Electrical & Electronics with First division or equivalent.
		3. Wireless Communication	M.Tech. Electronics Engineering/ Electronics & Comunication/ Electronics & Instrumation/electrical & Electronics with First division or equivalent.
HKCH01	Chemical Engineering	1. Catalysis & Kinetics	M.Tech Chemical Engineering with First division or equivalent.
		2. Emulsion P)polymerization	
		3. Petroleum	
		4. Environmental Engineering	

60. TKM College of Engineering, Kollam (Kerala) - 691 005 (Addendum)

Code	Department	Fields of specialization	Minimum Qualification
TKCE01	Civil Engineering	Will be notified later	Will be notified later
TKME01	Mechanical Engineering	Will be notified later	Will be notified later

QUALITY IMPROVEMENT PROGRAMME

Application for Advance Admission to Ph.D. Degree Programme 2014-2015
Copy to Principal Coordinator

Specimen Application and NOT to be used for filling application

Stamp Size Photo

1. Application Number :

2. Name :

3. Designation :

4. Department :

5. College Address :

6. Contact Address :

7. Phone (Office) : **8. Mobile :**

9. Phone (Residence) : **10. Email :**

11. Date of Birth : **12. Gender:**

13. Category : **14. Married:**

15. Physically Disabled : **Yes/No**

16. UG Degree :

Year : University :

Class/Division : Overall Percentage/CGPA :

17. UG Degree :

Year : University :

Class/Division : Overall Percentage/CGPA :

18. Teaching Experience as on September 30, 2014 (Tuesday) :

19. Industrial / Research Experience as on September 30, 2014 (Tuesday):

20. Number of QIP/ISTE/AICTE/IMPACT Courses Attended

a) 4 to 7 days Duration: b) Two weeks Duration: c) More than 2 weeks:

21. Number of Research Papers:
a) In Refereed journals: b) In Conference Proceedings:

22. Institutions and Departments to which Admissions are sought

	Name of the Institute	Choice of Specialization	
		First Choice	Second Choice
Preference 1			
Preference 2			
Preference 3			

23. Academic Data (Examination Passed B.E/B.Tech/B.Arch/B.Sc(Engg)/Equivalent)

Semester/Year	University	Year	Specialization	Class	Marks Obtained	Percentage	GPA

24. Academic Data (Examination Passed M.E/M.Tech. or Equivalent)

Semester/Year	University	Year	Specialization	Class	Marks Obtained	Percentage	GPA

25. Any other Qualification

Degree	University	Year	Specialization	Class	Marks Obtained	Percentage	GPA

26. Teaching Experience at Degree Level as on September 30, 2014 (Tuesday)

Sl.No	Name and Address of Employer & Institution	From (Date)	To (Date)	Years-Months	Designation

27. Industrial/Research Experience as on September 30, 2014 (Tuesday)

Sl.No	Name of the Organization	From (Date)	To (Date)	Years-Months	Designation

28. Short Term Courses

Sl.No	Name of the Course & Category	Organizer	Days	From	To

29. Research Papers/Book

Sl.No	Title of Paper/Book	Name of Author(s)	Name of Journal/Conference	Year	Vol.	Pages

Declaration

a. I declare that all the information given by me in this application form is correct to the best of my knowledge and belief, and I understand that false or incomplete information would cause invalidation of the application.

b. I shall abide by the decision of the National QIP Coordination Committee in all matters pertaining to admissions. The decision of the Committee shall be final and binding on me.

c. I shall abide by the rules and regulations of the Institutions to which I will be offered admission, if selected.

d. For all legal actions, suits and proceedings, the jurisdiction of a court of law shall be deemed to lie exclusively at the place at which the Institution considering me for admission is situated or the place where the office of the Principal Coordinator QIP is located and at no other court of place.

e. I understand the contents of this form and, particularly, this declaration being made here.

Place: **Signature of the Applicant**
Date :

Certificate and Forwarding Note by the Principal/Head of the Institution

a) Our Institution as well as the academic department, to which the applicant

Mr/Ms----------

belongs, is approved by AICTE (Not applicable, if the candidate belongs to a National Institute of Technology (NIT) or National Institute of Technical Teacher's Training & Research (NITTTR))

b) The applicant is a full-time regular / permanent faculty member of our Institution and is not on deputation to any other Institution.

c) The applicant has ___ years and ____months of teaching experience as on **September 30, 2014 (Tuesday)** at the graduate level (Certificates enclosed)

d) The applicant will be relieved full-time for the programme on deputation and will be paid full salary and allowances during the tenure of his/her sponsorship, if selected for admission.

Office Seal: **Signature of Principal or Head of Institution**

(with full contact details)

Date:

Note:

- Conditional Recommendation will not be accepted.
- This Forwarding Note should be signed only by the Principal or the Head of the Institution.
- Any alteration made in the text of this Forwarding Note leads to automatic rejection of the application.
- Please attach separate experience certificate.
- Please attach a photocopy & the draft.

For any further details please contact the zonal QIP coordinators at address indicated below:

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