



**INDIAN INSTITUTE OF TECHNOLOGY
(BANARAS HINDU UNIVERSITY),
VARANASI-221005**

INFORMATION BROCHURE

**(PH.D. ADMISSION IN THE DIRECT/LATERAL ENTRY CHANNEL
UNDER PMRF- ODD SEMESTER 2020-21)**

01. IMPORTANT DATES:

1.	Start Date and Time for Application Submission	8.00 a.m., June 20, 2020
2.	Last Date and time for Application	5.00 p.m., July 31, 2020

Note: the last date and time shall not be extended.

02. ELIGIBILITY CRITERIA : Candidates can apply for PMRF through two channels:

A) DIRECT ENTRY CHANNEL

To apply for PMRF through this channel, the candidate must satisfy all of the following criteria:

- (1) The applicant should have satisfied one of the following criteria:
 - (a) Completed or be pursuing the final year of four (or five) year undergraduate or five year integrated M.Tech. or 2 year M.Sc. or five year undergraduate postgraduate dual degree programs in Science and Technology streams from IISc/IITs/NITs/IISERSs/IIEST and centrally funded IIITs. These candidates should have secured a CGPA/CPI of at least 8.0 (on a 10-point scale). For applicants in the five year integrated or dual degree programs, if separate CGPAs/CPIs are awarded for UG and PG parts of the program, the CGPA/CPI of the UG part (first four years) will be considered.
OR
 - (b) Completed or be pursuing the final year of four (or five) year undergraduate or five year integrated M.Tech. or five year integrated M.Sc. or 2 year M.Sc. or five year undergraduate-postgraduate dual degree programs in Science and Technology streams from any other Institute/University recognized in India, not covered in 1(a) above. These candidates should have secured a minimum CGPA of 8 or equivalent apart from a minimum score of 650 in the respective GATE subject.
OR
 - (c) qualified GATE and be pursuing or have completed M.Tech./MS by research at one of the PMRF Granting Institutions having a minimum CGPA or CPI of 8.0 (on a 10-point scale) at the end of the first semester with a minimum of four courses. For those candidates who are applying after the first semester, the CGPA or CPI requirement of 8.0 will be based on all the courses, labs, thesis that the candidate has completed.
- (2) They apply for Ph.D. programme in one the PMRF granting institutes and get selected in the programme.
- (3) The PMRF granting institute, which has admitted the student in the Ph.D. programme makes a strong recommendation, and uploads the relevant information at the PMRF web-portal. Student can only get admission in those institutes where he/she has got selected and wishes to seek admission (i.e., selection in one institute and availing PMRF from another institute which does not support the student for PMRF will not be allowed).

- (4) The metrics on which the candidates will be judged will include (but not restricted to): research exposure, publications, performance in international competitions (like Math. Olympiad, ACM ICPC Programming Contest), grades and recommendation letters.
- (5) Within 12-18 months of admission into the PhD programme, the progress of the candidate will be reviewed by the PMRF panel, and continuation of PMRF will be subject to candidate's satisfactory performance. A strong research proposal is mandatory, and a clear assessment from the host institution in support of continuation of PMRF status. Due weightage would be given to publication in reputed journals/conferences.

B) LATERAL ENTRY CHANNEL

To apply for PMRF through this channel, the candidate must satisfy all of the following criteria:

- (1) The candidate should be pursuing Ph.D. in one of the PMRF granting institutions. Further, he/she should have completed at most 12 months in the PhD programme if he/she joined the programme with a Master's degree; and should have completed at most 24 months in the PhD programme if he/she joined the PhD programme with a Bachelor's degree. The relevant period of 12 months or 24 months will be counted from the date of admission in the PhD programme till the date of application for lateral entry. A candidate can be considered at most twice through lateral entry channel PMRF. In case of Integrated M.Tech/MSc and PhD programmes, the candidate will be eligible to apply within 12 months of the date of satisfying the Master's degree requirement.
- (2) The candidate should have completed at least four courses in the PhD programme, each of which should be a full-semester course, and obtained aggregate CGPA of 8.5 (out of 10) or higher.
- (3) The PMRF Granting Institute, in which the student is enrolled, makes a strong recommendation for the candidate and uploads the relevant information on the PMRF web-portal. This includes a research proposal and soft copies of publications (which could include those under submission).
- (4) Candidate continues work only in the host institute and transfer to another PMRF eligible institute is not allowed. Further, once enrolled in a PhD programme through lateral entry, the candidate cannot be considered for direct entry channel in a subsequent year.
- (5) The metrics on which the candidates will be judged include (but not restricted to) a strong research proposal, publications record and grades. Due weightage should be given to publication in reputed journals/conferences.

Note: Candidates are accordingly advised to visit the PMRF website before applying. The link is given below:

<https://may2020.pmrf.in/index.php/guidelines/eligibility-and-application-procedure>

03. FORMAT OF THE APPLICATION:

Format of the application form is given at Annexure-A. Application forms should be submitted as per the format only. No column/table/field should be deleted if not applicable to a candidate. Link to the Annexure-A is given below:

https://iitbhu.ac.in/contents/institute/academics/academic_info/doc/pmrf_application.docx

04. FOR APPLICATION SUBMISSION, FOLLOW STEPS AS GIVEN BELOW:

Step 1: Application forms (duly filled in all respect) should be converted into PDF.

Step 2: Copy of relevant Degree certificates / Marksheets / GATE Scorecard/ Research Proposal(s) should be converted into PDF.

Step 3: Combining the application form and relevant documents in one single PDF.
 Step 4: Application forms (alongwith relevant documents) in PDF should be e-mailed only at: coordinator.pmr@iitbhu.ac.in on or before the last date and time.

(Application forms submitted through any other channel / mode shall not be accepted)

05. STATEMENT OF PURPOSE:

Candidate should submit his/her ‘**Statement of Purpose**’ (Department / School wise separately) as per the Annexure-B (which is given alongwith the Annexure-A). The Statement of Purpose should include the following components:

- (i) Research Proposal
- (ii) Details of Research publications in reputed journals (SCI/Scopus/Non SCI/ Non Scopus) with impact factor (if any)
- (iii) Details of National / International Conference attended or paper presented.

06. Applications should be submitted in relation to following

(A) Departments/ Schools/ Disciplines and Allied Disciplines for Ph.D. Programmes.

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

Departments/ Schools offering the Programme	Discipline	Allied Disciplines
		Science and Technology. M.Sc./M.Tech. in Geophysics, Geology.
Department of Computer Science & Engineering	Computer Science & Engineering	B.Tech./B.E./M.Tech./M.E. degree in Computer Technology/ Information Technology/ Electronics Engineering/ Electronics and Communication Engineering/All related subjects of Computer Engineering at M.Tech. level/ M.Tech. in Mathematics & Computing.
Department of Electrical Engineering	Electrical Engineering	B.Tech. & M.Tech. in Electronics Engineering.
	Systems Engineering	Bachelor's and Master's Degree in any Branch of Engineering or Bachelor's Degree in any Branch of Engineering.
Department of Electronics Engineering	Electronics Engineering	Master's degree in any of the following areas: Digital Communication Systems, Information and Coding Theory, Telecom Networks, Mobile and Wireless Communication Systems, Digital Systems and Microprocessors, Digital Signal and Image Processing, Computer Vision and Robotics, Signal and Systems Theory, Control Systems, Fuzzy Logic, Neural Networks and their applications, Power Electronics, Microelectronics and VLSI Systems, Semiconductor Device Modelling and Simulation, Solid State Devices, Organic Electronics, Transparent Semiconductors and Photovoltaics, Sensors and Pattern Recognition, Electronic Instrumentation and Virtual Instrumentation, Electromagnetics, RF Engineering and Microwaves, Antennas, Optoelectronics and Optical Communication, Photonic Networks and Systems, Information Technology.
Department of Mechanical Engineering	Mechanical Engineering	Bachelor's degree in Production Engineering and Master's degree in any discipline/ area relevant to Mechanical Engineering.
	Industrial Management	Bachelor's degree in any branch of Engineering and Master's degree in any branch of Engineering/Management.
Department of Metallurgical Engineering	Metallurgical Engineering	Bachelor's / Master's degree in Mechanical / Chemical / Production Engg./Manufacturing Engg./Mineral Engg./ Ceramic Engg. Master's degree in Materials Science / Engg./ Technology Master's degree in Physical Sciences (Solid State Physics)/Chemical Sciences (Inorganic / Physical Chemistry/Industrial Chemistry)/ Biological Sciences/Geology with Mathematics as a subject at Bachelor's level.
Department of Mining Engineering	Mining Engineering	Master's degree in Geology/Geophysics/Geohydrology Mathematics/ Petroleum Geosciences /Chemistry/ Environmental Science/Materials Science/Botany/ Zoology/Polymer Science/Computer Science Master's degree in Chemical Engg. / Environmental Engg. /Civil Engg./Industrial Engg./Mechanical Engg./Electrical Engg./Computer Engg./Electronics Engg./Polymer Engg. or Technology/ Ceramic Engg./Materials Engg./Information Technology

Departments/ Schools offering the Programme	Discipline	Allied Disciplines
Department of Pharmaceutical Engineering and Technology	Pharmacy	MS/M.Pharm./M.Tech. in Pharmacy/ Pharmaceutical Sciences/ Pharmaceutical Engineering/Pharmaceutical Technology/ Pharmaceutical Biotechnology/ Bioinformatics/ Biochemical Engineering/ Biomedical Engineering with graduation in Pharmacy (B.Pharm./B.Tech.).
Department of Physics	Physics	M.Sc./M.Tech. in Applied Physics, Engineering Physics, Bio-Physics, Electronics Engg., Materials Science, Ceramic Engg., Metallurgical Engg., Electrical Engg., Bio-Informatics, Geomatics and Geoinformatics, Computer Science, Computer Engg., Mechanical Engg., Mathematics, Chemistry, Remote Sensing, Astrophysics, Space Physics, Applied Optics, Atmospheric Physics, Fibre Optics & Photonics, Nanotechnology and Biotechnology.
Department of Chemistry	Chemistry	M.Sc./M.Tech. in Microbiology/ Chemistry/ Industrial Chemistry/ Applied Chemistry/ Biochemistry/ Biotechnology/ Medicinal Chemistry/ Materials Science & Technology/ Environmental Science and Nano Technology with chemistry as a subject at Bachelor Level.
Department of Mathematical Sciences	Mathematical Sciences	Master's degree in Statistics/ Computer Science/ Computer Engineering, with Mathematics as a subject at Bachelor's level. Bachelor's degree (B.Tech./B.E.) in Mathematics and Computing/ Computer Engineering/Computer Science.
School of Biochemical Engineering	Biochemical Engineering	Master's degree in Biochemistry / Biotechnology/Microbiology/ Environmental Science. Bachelor's/Master's Degree in Biochemical Engg./ Food Technology/Pharmacy/Chemical Engineering/Biotechnology
School of Biomedical Engineering	Biomedical Engineering	B.Tech./M.Tech. degree in Bioengineering/Electrical Engg./ Electronics Engg./Instrumentation Engg./Mechanical Engg./ Computer Engg./Materials Science & Technology/ Chemical Engg./ Bio-technology/ Nanotechnology. M.Sc./M.Tech./Engineering in Pharmacy. M.Sc./M.Tech. in Statistics, Mathematics. M.Sc. degree in Physics/Chemistry/Polymer Sciences/ Biochemistry/ Life Sciences.
School of Materials Science & Technology	Materials Science & Technology	Master's degree in Chemical Sciences, Materials Science and Physical Sciences. Bachelor's / Master's degree in Ceramic/ Chemical/ Civil/ Electrical/ Electronics/ Mechanical / Metallurgical/ Polymer Engineering/ Plastic Technology/ Materials Technology/ Nanotechnology. Master's degree in Dentistry/ Orthopedics/ E.N.T./ Rasa Shastra.

(B) Discipline-wise Research Areas for Ph.D. Programmes.

The discipline-wise the Research Areas in the Ph.D. programmes are listed below.

Disciplines	Research Areas
Ceramic Engineering	Bio-Ceramics, Ceramic/Metal/Polymer matrix composites, Electro Ceramics, Glass and Glass Ceramics, Refractories, Advanced Ceramics, Nano Technology, Cement & Concrete Technology, Energy Materials.

Disciplines	Research Areas
Chemical Engineering	To be announced at the time of Interview
Civil Engineering	Structural Engineering; Hydraulics and Water Resources Engineering; Environmental Engineering; Geotechnical Engineering; Transportation Engineering; Geo-informatics; Geology.
Computer Science & Engineering	Social Network Analysis, HPC, Machine Vision, Natural Language Processing, Information Extraction, Data Mining, Image Processing, Pattern Recognition.
Electrical Engineering	Electrical machines & Drives; Power Electronics; Control Systems; Power Systems
Systems Engineering	Systems Engineering
Electronics Engineering	Microwave Engineering; Digital Techniques and Instrumentation; Microelectronics, Communication System Engineering
Mechanical Engineering	<p>a) Machine Design: Fracture behavior of fibre composite through thickness, Mechanical behavior of biocomposites; Composites, Impact and failure mechanisms, Computational Fracture Mechanics, Transient Dynamics; Nuclear graphite and Fracture Characterization; Biomechanics, Cardiovascular stent design; Tribology; Fracture Mechanics; Composite Materials such metal matrix composite, hybrid composite and nano composite for the mechanical and tribological applications; Fatigue wear modeling, contact modeling and its relevance to wear, Reliability of MEMS Devices.</p> <p>b) Production Engg.: Additive manufacturing, unconventional manufacturing, Incremental Forming & Manufacturing, Metal forming, Manufacturing automation using: CAD/CAM/CAE/CE/Reverse Engg.; Tool wear condition monitoring; Materials aspect of Tribology, Composite Materials and Laser Surface Texturing; Weld metal characteristics, Thermal effects on weld metal properties, stress removal in casting.</p> <p>c) Thermal and Fluid: Thermal behavior of Fibre Composite Materials; Solar Thermal, Alternate Fuel, Hybrid System; Engine Simulation; Multi-phase flows related to Molten Metal-Gas interaction, Hydro and Gas cyclones, Droplet/Bubble dynamics; Atomization – Pressure assisted, Electrohydrodynamic; Aerosol generation and measurement; Particle Image Velocimetry; Heat and Mass Transfer Analysis of Grains during fluidized bed drying for achieving energy economy and higher quality; Influence of Climate Change for the Specification of Design Wind Speed of Engineering Structure, Gasification based Polygeneration Cycle of Biomass for Hydrogen Production; Numerical and Experimental analysis of pulverized coal and biomass combustion.</p>
Industrial Management	Operations Management, SCM, Production System
Metallurgical Engineering	Microstructural, Structural and Chemical Characterization; Mechanical Behavior, Deformation Processing and Failure Analysis; Phase Equilibria and Phase Transformation; Non-Equilibrium Processing of Advanced Materials; Ultra-Fine Grained and Nano-Structured Material; Metallurgical and E-Waste Utilization; Design

Disciplines	Research Areas
	and Development of Advanced Steels; Tribology and Surface Engineering' Thermodynamics and Kinetics of Metallurgical Processes' Advanced Structural and Functional Materials.
Mining Engineering	To be announced at the time of Interview
Pharmacy	Pharmaceutics, Pharmaceutical Chemistry, Pharmacology, Pharmacognosy.
Physics	Solar & Space Plasma Physics, Condensed Matter Physics (Theory), Quantum Information, Condensed Matter Physics (Experiment) & Materials Science (Experiment), Biophysics, Photonics (Theory and Experiment), Remote Sensing, High Energy Physics, Nuclear Physics, Cosmology.
Chemistry	Synthetic Chemistry, Environmental Chemistry, Surface Chemistry, Computational Chemistry.
Mathematical Sciences	Harmonic Analysis, Differential Geometry, Numerical Wavelet methods for partial differential equations, Numerical Analysis of PDEs, Mathematical Image Processing, Stochastic Modeling (Queuing Theory), Integral Equations, Numerical Analysis, Optimization, Fluid Dynamics, Biomechanics, Non-Linear Waves, Graph Theory and Network Science, Rings and Modules, Mathematical Modeling and Porous Media, Soft Computing, Fuzzy Sets, Algebraic Numerical Techniques, Mathematical Modeling on heat Transfer Problem.
Biochemical Engineering	To be announced at the time of Interview
Biomedical Engineering	Physiology; Electrophysiology & Neuro Biology; Polymer in Medicine; Bioinstrumentation, Biomedical Signal & Image Processing; Modeling of Biological System, Biological Control System Analysis; Biomechanics; Tissue Engineering & Micro fluidics; Molecular Biology, Biochemistry, Biotechnology & Nano Medicine; Optical Nanomaterial, Biosensing, Image Theuranostics.
Materials Science & Technology	M.Sc./B.Tech./M.Tech. Degree in Materials Science/Physics/ Chemistry/ Polymer Science/ Materials Science & Technology/ Polymer Engineering & Technology/Nanoscience and Nanotechnology/ Biotechnology.

For further information, candidates may visit the website of IIT(BHU) → <https://www.iitbhu.ac.in/dept>.

07. OTHER TERMS AND CONDITIONS:

(Before applying, candidates are advised to read each and every instruction given in this Information Brochure very carefully)

1.	The prescribed qualifications and eligibility are the minimum required and the mere fact that a candidate possesses the same will not entitle him/her for being called for an interview.
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2.	A candidate can apply in one or more departments / schools. Accordingly, choice of departments / schools should be in proper sequence in the application form. <i>If you are applying more than one department/ school you must fill Annexure-B of the application form separately for each department/ school.</i> Any alteration/modification/change in choice will not be considered after application submission.
3.	In the application form, all entries should be filled carefully. IIT(BHU) will not be responsible for wrong entries. Candidates shall be solely responsible for the correctness and authenticity of the information / documents provided with the application form.
4.	Candidates must fill/enter their CGPA/CPI as issued by their institute/college/university. Candidate must not convert their CGPA/CPI into percentage and vice-versa.
5.	Application submitted by the candidates shall be considered final and binding. Requests for making correction in the application form shall not be entertained.
7.	Candidates should submit complete application in all respect. No correspondence / communication will be entertained for incomplete application.
8.	Applications will be scrutinized; relevant documents will be checked / verified for their authenticity.
9.	Research Fellows shall be governed by PMRF rules and regulations in practice and as applicable from time to time.
10.	The Institute has the right to cancel, at any stage, the application of the candidate who is found unqualified or ineligible in accordance with the eligibility criteria and rules/regulations/guidelines in force.
11.	Disputes if any, arising out of or relating to any matter whatsoever, concerning the aforesaid shall be subject to the exclusive jurisdiction of Varanasi Court.
12.	The Institute reserves the right to verify the antecedents or documents submitted by the candidate at any time. In case it is found that the documents submitted by the candidate are not genuine, then his/her admission shall be terminated, and disciplinary / criminal proceedings will be initiated.
13.	Merely applying for / being shortlisted / appearing for the interview / written test /or subsequent processes do not imply that a candidate will necessarily be offered admission. No request for considering the candidature in department, other than in which applied, will be entertained.
14.	The candidates should ensure that they fulfill all the eligibility conditions as specified. Their admission will be purely provisional subject to confirmation that they satisfy the prescribed eligibility conditions. Mere issue of call letters to the candidates should not be treated as guarantee towards admission and will also not imply that his/her candidature has been found eligible.
15.	Candidates are advised to fill their correct and active e-mail addresses in the application form as all correspondence will be made by the Institute through e-mail only. No separate communication will be made. Further, for any updates, please visit the Institute website regularly. The Institute shall not be responsible for the failure of candidates with respect to visiting their e-mails and the website on any ground.
