

Annexure-I

Table 1A : Departments/Schools/Disciplines and Allied Disciplines for Ph.D. Programmes.

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

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

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

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

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

Table 1B : Discipline-wise Research Areas for Ph.D. Programmes.

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

Disciplines	Research Areas
Ceramic Engineering	Bio-Ceramics, Ceramic/Metal/Polymer matrix composites, Electro Ceramics, Glass and Glass Ceramics, Refractories, Advanced Ceramics, Nano Technology, Cement & Concrete Technology, Energy Materials.
Chemical Engineering	To be announced at the time of Interview
Civil Engineering	Structural Engineering; Hydraulics and Water Resources Engineering; Environmental Engineering; Geotechnical Engineering; Transportation Engineering; Geo-informatics; Gology.
Computer Science & Engineering	Social Network Analysis, HPC, Machine Vision, Natural Language Processing, Information Extraction, Data Mining, Image Processing, Pattern Recognition.
Electrical Engineering	Electrical machines & Drives; Power Electronics; Control Systems; Power Systems
Systems Engineering	Systems Engineering
Electronics Engineering	Microwave Engineering; Digital Techniques and Instrumentation; Microelectronics, Communication System Engineering
Humanities and Social Sciences	<ul style="list-style-type: none"> a) English b) Philosophy (Indian and Western Logic, Peace and Ahimsa Studies, Gandhian Philosophy, Value Education, Humanistic Philosophy) c) Computational Linguistics (MT, CALL, Computational Semantics, Grammar Formalism, Sanskrit Computation Linguistics) d) Psychology (Intelligence, Indigenou Research, Macro Organizational Behaviour) e) Sociology (Environmental Sociology, Sustainable Urbanization, Smart Cities)
Mechanical Engineering	<ul style="list-style-type: none"> a) Machine Design: Fracture behavior of fibre composite through thickness, Mechanical behavior of biocomposites; Composites, Impact and failure mechanisms, Computational Fracture Mechanics, Transient Dynamics; Nuclear graphite and Fracture Characterization; Biomechanics, Cardiovascular stent design; Tiobology; Fracture Mechanics; Composite Materials such metal matrix composite, hybrid composite and nano composite for the mechanical and tribological applications; Fatigue wear modeling, contact modeling and its relevance to wear, Reliability of MEMS Devices. b) Production Engg.: Additive manufacturing, unconventional manufacturing, Incremental Forming & Manufacturing, Metal firming,

Disciplines	Research Areas
	<p>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 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.
Chemistry	Synthetic Chemistry, Environmental Chemistry, Surface Chemistry, Computational Chemistry.
Mathematical Sciences	Harmonic Analysis, Differential Geometry, Numerical Wavelet methods for partial differential equations, Numerical Analysis of PDEs, Mathematical Image Processing, Stochastic Modeling (Queuing Theory), Integral Equations, Numerical Analysis, Optimization, Fluid Dynamics, Biomechanics, Non-Linear Waves, Graph Theory and Network Science, Rings and Modules, Mathematical Modeling and Porous Media, Soft Computing, Fuzzy Sets, Algebraic Numerical Techniques, Mathematical Modeling on heat Transfer Problem.

Disciplines	Research Areas
Biochemical Engineering	To be announced at the time of Interview
Biomedical Engineering	Physiology; Electrophysiology & Neuro Biology; Polymer in Medicine; Bioinstrumentation, Biomedical Signal & Image Processing; Modeling of Biological System, Biological Control System Analysis; Biomechanics; Tissue Engineering & Micro fluidics; Molecular Biology, Biochemistry, Biotechnology & Nano Medicine; Optical Nanomaterial, 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.