

Information Brochure

Admission

To

Ph.D. (Full Time)

January 2018



**Visvesvaraya National Institute of
Technology, Nagpur**

1.1 PROGRAMMES OFFERED BY THE INSTITUTE

Sr. No.	Programme	Departments
1.	Ph.D. (Full Time) with Teaching Assistantship *	Engineering : Civil, Electrical, Electronics & Communication, Centre for VLSI & Nano Technology, Computer Science, Chemical, Mechanical, Metallurgical & Materials, Mining, Applied Mechanics. Architecture & Planning Applied Sciences: Physics, Chemistry, Mathematics, Humanities.
2.	Ph.D. (Full Time) Sponsored (place of research work VNIT only)	
3.	Ph.D. (Full Time) Sponsored Candidate category from 100% centrally funded research laboratories including public sector and private industries #	

NOTE : Institute will not provide any stipend or any other financial support to Ph.D. (Full Time) sponsored candidates.

***Candidates desirous of seeking admission to Ph. D. (Full Time) programme with teaching assistantship should note that**

1. The candidate's admission and eligibility for emolument shall be subject to his signing agreement with the institute
2. The emoluments for full-time Ph.D. scholar with Teaching Assistantship:

Sr. No.	Qualifying Degree	Emoluments per month
i)	Post Graduate (M. Sc. or equivalent) Degree in Basic Science with NET/GATE Qualification or Graduate Degree in Professional Course with NET/ GATE 2Qualification	Rs. 25,000/-
ii)	Post Graduate degree in engineering/ technology (M.E./M.Tech./M.Arch. or equivalent) with NET/GATE qualification	Rs. 25,000/- (1 st & 2 nd Year) Rs. 28,000/- (3 rd year onwards)

3. Stipend enhancement after 2nd year and stipend extension after 4th year, both will be subject to satisfactory progress assessment by a review committee.
4. Teaching assistantship shall be offered for a maximum period of five years only.
5. Number of seats per department may change depending on availability of Ph.D. vacancy under Supervisor & suitability of the candidates.

Special instructions to the candidates seeking admission under Ph.D. (full time) sponsored candidate category from 100% centrally funded research laboratories including public sector and private industries:

The candidates desirous of seeking admissions for Ph.D. program under the above scheme should meet the following requirements:

1. Candidate should posses M.E. / M. Tech. / M.Arch. / M.Plan. / M.Sc. degree having **qualified GATE / NET exam** in past and he/she should have minimum Five years experience in Industry.

2. VNIT committee shall examine the research facilities in research laboratory in which the candidate is employed where the candidate wishes to carry out part of his Ph.D. research. In case the committee report is favorable and suitable co-supervision (as certified by the committee) is available in the candidate's parent organization where the candidate proposes to carry out research, VNIT may exempt the stay requirement on campus on case to case basis.
3. In any case, minimum stay at VNIT is **Six** months for completion of course work and other related research work. If he/she fails to do so, he/she has to stay another six months at VNIT Nagpur to complete the course work. It is candidate's responsibility to obtain deputation / leave from parent organization.
4. Candidate admitted under this program will be treated as a sponsored candidate at VNIT (degree will be awarded by VNIT).
5. He/she should appear for written test & interview as per Institute's norms.
6. Main Supervisor will be from VNIT and optional qualified Co-supervisor approved by VNIT will be from the candidate's parent organization.
7. All six monthly seminars should be delivered at VNIT only. Attendance record of the candidate will be maintained at VNIT. In this respect, it may be noted that the attendance in parent organization of candidate where he carries research, duly certified stating that the candidate has substantially (deemed to be full time) carried out research in the parent organization by Co-supervisor / immediate superior of the candidate, shall be submitted to VNIT before conducting six monthly seminar.
8. As far as possible, co-supervisor shall also attend the six monthly progress seminar and thesis defense viva-voce. However, no financial assistance will be permissible from VNIT for travel of co-supervisor.
9. Institute will not provide any stipend or any other financial support (for conferences etc.) to these candidates.
10. Fees to be paid at VNIT as per the norms & policy of the institute as applicable to full time sponsored candidate(s).
11. Candidates should satisfy all degree requirements (including publications) as specified by VNIT for the award of Ph.D. degree.
12. It is clarified that candidate from academic institute is not considered under this scheme, since such candidates have the opportunity for doing full time Ph.D. program through schemes like Quality Improvement Program (QIP) and Full Time Ph.D. with teaching assistantship and Ph.D. full time sponsored (place of research will be VNIT only)
13. In case candidate fails to complete the course work within one year from the date of registration, his/her admission stands cancelled automatically and no further extension will be granted.

1.2.1 Important dates to remember –

- Date of notification - **Friday, 03.11.2017**
- Last date of submission of application - **Monday, 27.11.2017**
- Display of list of eligible candidates - **Monday, 04.12.2017**
(in website vnit.ac.in)
- Written test for eligible candidates - **Wednesday, 13.12.2017**
- Interview for short listed candidates - **13.12.2017 & 14.12.2017**

1.2.2 Schedule for Written Test & Interview

	Department	Written Test (Date & Time)	Interview (Date & Time)
1.	Applied Mechanics	13.12.2017 10.00 am to 11.00 am	13.12.2017 2.30 pm to 5.00 pm
2.	Architecture and Planning		
3.	Chemical Engineering		
4.	Mathematics		
5.	Electronics & Communication Engineering		
6.	Humanities and Social Sciences		
7.	Chemistry		
8.	Metallurgy and Materials Engineering		
9.	Mining Engineering		
10.	Physics		
11.	Civil Engineering	13.12.2017 11.30 am to 12.30 pm	14.12.2017 10.00 am to 1.00 pm
12.	Computer Science and Engineering		
13.	Electrical Engineering		
14.	Mechanical Engineering		
15.	VLSI & Nanotechnology		

*** Written Test and Interview will be held in the respective department**

1.3 ELIGIBILITY CRITERIA

Sr. No.	Name of the Department	Eligibility for Ph.D
1.	Applied Mechanics	B.E. / B. Tech./ AMIE in Civil Engineering AND M E / M.Tech in Structural Engineering related specialization with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Candidate should have qualified GATE score or equivalent national level exam in past.
2.	Chemical Engineering	1. BE / B. Tech. in Chemical Engineering / Chemical Technology/ Biochemical Engineering / Biotechnology/ Nanotechnology AND 2. M E / M. Tech in Chemical Engineering / Chemical Technology/ Biochemical Engineering / Biotechnology /Nanotechnology/ Environmental Engineering/Industrial Pollution Abatement/ Bio Process Engineering/ Mineral Processing/Food Technology/Computer Aided Chemical Engineering and Chemical Engineering related disciplines with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Candidate should have qualified GATE score or equivalent national level exam in past.
3.	Civil Engineering	B.E. / B.Tech / AMIE (Civil) and M E / M.Tech in any branch of Civil Engineering with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Qualified GATE score or equivalent national level exam in past.
4.	Computer Science and Engineering	B.E. / B. Tech. / AMIE or equivalent in any branch of Engineering and M.E./M. Tech or equivalent in one of the following branches : Computer Science/ Computer Technology/Computer Engineering/ Information Technology/ Information Science with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Candidate should have qualified GATE score or equivalent national level exam in past.
5.	Electrical Engineering	B.E./B.Tech in Electrical Engineering or Allied branches and M E / M. Tech in Electrical & Electronics / Power Systems/ Integrated Power Systems/Power Electronics and Drives/ Energy Systems / Control System/ Instrumentation & Control / Power Electronics / Electric Drives with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Candidate should have qualified GATE score or equivalent national level exam in past.
6.	Electronics & Communication Engineering	1. B.E. / B. Tech. /AMIE/AMIETE/B.Sc.(Engg.) of four years duration in one of the following branches : Electronics and Communication /Electronics and Telecommunication/ Electronics/ Electronics and Instrumentation with a minimum of First Class or C.G.P.A. not less than 6.75/10 AND 2. M.Tech/M.E./M.S.(at least two year program) in above branches or departments with specialization in the following RF/Wireless/Antenna/ Signal and Image Processing/Communication Systems/ Embedded Systems with First class or CGPA not less than 6.75 out of 10. AND 3. Candidate should have qualified GATE in the past.
7.	VLSI & Nanotechnology	M.E. / M. Tech in one of the following branches Microelectronics, Nanoelectronics, VLSI and embedded system, VLSI design, VLSI systems, digital Electronics, Microelectronics AND VLSI design or VLSI and Embedded systems related branches OR

		Microelectronics /Nanoelectronics related branches with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Qualified GATE score or equivalent national level exam in past.
8.	Mechanical Engineering	M E / M. Tech in Mechanical Engineering / Production Engineering / Automobile Engineering / Industrial Engineering / Power Plant Engg. / Chemical Engineering / Aerospace Engineering / Energy Systems & Engineering /Production and Industrial System Engg./ Materials Engg./ Technology, Thermal Engineering, Fluid and Thermal Engineering with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Candidate should have qualified GATE or equivalent national level exam in past.
9.	Metallurgy and Materials Engineering	M E / M. Tech in Metallurgy / Material Engineering / Mechanical / Production / Industrial / Chemical with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Qualified GATE score or equivalent national level exam in past.
10.	Mining Engineering	M E / M. Tech in Mining Engg or related to Mining Engg / Civil Engineering / Env. Engg. / Geo-Tech Engg/ Mine Planning / Rock Mechanics / Opencast Mining / Mineral Engg. OR M.Sc. / M.Sc. Tech in Geology / Applied Geology/ Environment with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Candidate should have qualified GATE score or equivalent national level exam in past.
11.	Architecture and Planning	B.Arch. / BE (Civil) / B.Tech.(Civil) / B.Plan. / B.Tech. (Plan) or equivalent with M.C.P./M. Arch./M.Des. / M.Tech. (Urban Planning) / M. Plan./ M.U.R.P. / ME (T&C.P) / other masters in relevant field with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Candidate should have qualified GATE score or equivalent national level exam in past.
12.	Physics	A Master's Degree in the concerned or an allied subject with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Qualified GATE/NET score or equivalent national level exam in past.
13.	Chemistry	M.Sc. in Chemistry (Organic / Inorganic/ Analytical/ Physical Chemistry/ Biochemistry and other allied specialisations) with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Bachelor's or Master's level. Candidate should have qualified GATE/ NET score or equivalent national level exam in past.
14.	Mathematics	M.Sc. in Mathematics / Applied Mathematics with a minimum of First Class (C.P.I. or C.G.P.A. greater than 6.75 on a 10 point scale) at Master's level. Candidate should have qualified GATE/NET score or equivalent national level exam in past.
15.	Humanities and Social Sciences	M.A. / MBA in English / Sociology /Psychology / Management with a minimum of First Class. Qualified GATE/NET score or equivalent national level exam in past.

Note:

i) The candidates having secured **Government Fellowship** i.e, DST fellowship, CSIR fellowship, UGC fellowship can apply for Ph.D program at VNIT even if candidate does not have valid GATE scores/NET qualification or candidate has not appeared

ii) *Candidates, whose M.E. / M.Tech/ M.Arch. / M.Plan. / M.Sc. result is awaited, can also apply for Ph.D. program. They will have to submit the result of M.E. / M.Tech/ M.Arch. / M.Plan. / M.Sc. exam before Jan 31, 2018, till that time their registration will be provisional.*

1.4 ADMISSION PROCEDURE

1.4.1 The application form is available on institute website www.vnit.ac.in.

Candidate has to pay application fee of Rs 500/- online through "State Bank Collect". After payment, SBI Collect generates receipt mentioning **SBCollect Ref. No.** (e.g.: DU65.....) Candidate shall mention this **SBCollect Ref. No** in the application form & also print a copy of the receipt.

The duly filled application form, along with photo copies of the certificates (self-attested) & photograph, and copy of SBCollect receipt, should be sent to –
Dy Registrar (Academic), VNIT, South Ambazari Road, Nagpur – 440010
Last date of receiving application - **Monday 27th November, 2017**

Incomplete application and/OR applications received after the last date are liable to be rejected. Candidates should mention the department name on the Envelope.

1.4.2 All candidates will be required to appear for the written test, which will be conducted in the respective departments on the date specified in the information brochure. Further, the candidates shortlisted on the basis of performance in the written test shall be interviewed.

Top most scorer of the written test will be normalized to 100 and marks of other candidates will be scaled accordingly. Then depending on the number of candidates to be called for the interview, Department can set a cut-off normalized score. However, normalized cut-off below 40% is not allowed. Candidates will appear for written test / interview at their own cost.

1.4.3. The interviews for the short listed candidates will be conducted in the concerned departments as per the schedule given in this brochure. The constitution of the interview committee will be as follows:

1. HoD of the concerned department - Chairman
2. Dean(R&C) / Dean (Acad)/ Professor from other department - Director's Nominee
3. All faculty members from the concerned department/ discipline who are recognized Ph.D. supervisors– Members

1.4.4

(i) Candidate should have qualified GATE/NET score. The GATE/NET score, percentile GATE score as well as qualified mark should be stated.

(ii) Candidate having M.E./ M. Tech. degree should have **qualified GATE or equivalent national level exam in past.**

(iii) Candidate should also score minimum 40% marks in Interview for selection.

(iv) Final list will be prepared based on following points

Written Exam (As per 1.4.2)	-	40%
Percentile Gate Score	-	40%
Interview	-	20%

Calculation of GATE/NET SCORE:

40% mark weightage for GATE = (0.40) x (percentile GATE score of the candidate)

Percentile GATE score = $100 \times ((\text{Number of candidate appeared in the exam} - \text{candidate's rank}) / (\text{Number of candidate appeared in the exam}))$

1.4.5 The provisional list of selected candidates will be displayed on Institute's website on 15th December, 2017 and no separate intimation will be sent to the candidates. Registration will be w.e.f. **January 1, 2018**. Selected candidates shall report to Dy. Registrar (Academic) for admission and payment of prescribed fees latest by 14th January, 2018.

1.4.6 Candidate shall report to the concerned department for allotted Supervisors. Candidate in consultation with the supervisor shall identify the area of research and prepare a synopsis. The supervisor will propose a **Research Progress Committee, (RPC)** for Ph.D. program. The RPC shall monitor the progress of Ph.D. work of the candidate. Following shall be the composition of RPC.

Head of the Concerned Department – (Chairman)

Supervisor(s)

Expert from Department (nominated by supervisor & approved by HoD)

Expert from allied Department/ Discipline (nominated by supervisor & approved by HoD)

1.4.7 RPC shall recommend the courses to be undertaken by a candidate as per norms.

1.5. REQUIREMENT OF COURSE WORK

Requirement of course work for Ph.D.

Program	Qualification	Courses to be completed
Ph.D.	M. Sc. / M.A.	12 credits (4 theory subjects)
Ph.D.	M. Sc. / M.A. with M. Phil.	06 credits (2 theory subjects)
Ph.D.	M.E. / M. Tech. / M. Arch./ M.Plan	06 credits (2 theory subjects)

RPC may recommend more course work if felt necessary. In addition to above, candidate will be required to undergo the course in **Research Methodology** (Audit Course). Ph.D. candidate will be required to complete all the course work within **one year** of joining the program.

1.6 MINIMUM DURATION OF PROGRAM

Minimum duration of Ph.D. program is three years

1.7 VALIDITY OF REGISTRATION

1.7.1 The registration will be valid for a period of 6 years from the date of registration and no further extension will be granted under normal circumstances.

1.7.2. After 6 years, if a candidate wishes to continue research, he / she will be required to register again. A candidate should apply for re-registration before completion of 6 years of registration period. Failure to do so a candidate will be required to register again following the procedure for fresh candidates.

1.8 PAYMENT OF FEES AND DEPOSITS (This is subject to the revision from time to time)

	Head	Ph.D. Admission (One Time)	Ph.D. Full Time with teaching assistantship (Per Sem)	Ph.D. Full Time (Sponsored) (Per sem)
1.	Registration fees	4000	--	--
2.	Library Deposit (refundable)	2400	--	--
3.	Library Fees	--	1600	3200
4.	Tuition Fees	--	7500	15000
5.	Retention Fees	--	1600	1600
6.	Internet Charges	--	1000	2000
7.	Infrastructure Usage Fee	--	1000	2000
	Grant Total RS.	6400	12700	23800

At the time of joining candidate has to pay one time fees and per semester fees together (i.e Rs. 19100/- for Ph.D. full time with teaching assistantship and Rs. 30200/- for Ph.D. Full Time (Sponsored)).

** Institute has student's medical aid fund policy and premium (one time Rs. 3000/-) towards the same will be required to be paid in addition to above fees. This is applicable to full time scholars.*

Examination Fee : The examination fee of **Rs. 30,000/- for Ph.D. full time/ Sponsored** shall be paid by the candidate prior to the submission of the thesis.

1.9 R&D project STAFF OF VNIT FOR ADMISSION FOR Ph.D.

Candidates who have recently joined as JRF or research staff in R&D projects sponsored to VNIT, may also apply for the Ph.D. program through the same selection process.

2.0 SYLLABUS FOR WRITTEN TEST

The syllabus for written test to be conducted (2.0.1) / Areas of Research (2.0.2) for Admission to Ph.D. (Full Time).

2.0.1. SYLLABUS (Department-wise)

SN	Name of Department	Syllabus for Written Test
1.	Mechanical Engineering	a) Engineering Thermodynamics b) Fluid Mechanics c) Heat Transfer d) Theory of Machines e) Machine design f) Production Technology g) Workshop Technology h) Measurements i) Computer Programming

2.	Electrical Engineering	<ul style="list-style-type: none"> a) Control Systems b) Electrical machines c) Power Systems d) Switchgear and Protection e) Power Electronics
3.	Civil Engineering	<ul style="list-style-type: none"> A.Environmental Engg <ul style="list-style-type: none"> a)Water Supply & Treatment b)Sewerage and Sewage Treatment c)Air pollution & Solid waste B. Water Resources Engg. <ul style="list-style-type: none"> a)Irrigation Engineering b)Hydrology & Water Resources Engg. c)Fluid Mechanics C. Transportation Engg. <ul style="list-style-type: none"> a)Traffic Engg. b)Pavement Design c)Highway Construction Materials D. Construction Management & Concrete Engg. <ul style="list-style-type: none"> a)Concrete Structure & Concrete Technology b)Construction Management c)Building Technology E. Geotechnical Engineering <ul style="list-style-type: none"> a) Soil Mechanics b) Foundation Engineering
4.	Electronics & Communication Engineering	<ul style="list-style-type: none"> a) Electronic Devices & Circuits, Analog Circuits b) Digital Circuits & Microprocessors c) Electromagnetics d) Electronic measurements f) Analog & Digital Communication g) Digital Signal Processing h) Computer Organization i) UHF & Microwave j) Linear Networks
5.	VLSI & Nanotechnology	<ul style="list-style-type: none"> a) Electronics Devices & Circuits, Analog Circuits b) Digital Circuits & Microprocessors c) Electromagnetics d) Electronic measurements f) Analog & Digital Communication g) Digital Signal Processing h) Computer Organization i) UHF & Microwave j) Linear Networks
6.	Computer Science Engineering	<ul style="list-style-type: none"> a) Programming & Data Structures b) System Programming/OS c) Compiler d) Theory of Computation e) Analysis of Algorithm f) Discrete Mathematics g) Computer Organization h) Database Management Systems i) Computer Networks

7.	Chemical Engineering	<ul style="list-style-type: none"> a) Mass Transfer, b) Heat Transfer, c) Chemical Reaction Engineering, d) Fluid Mechanics, e) Process Calculations, f) Process Control, g) Mechanical Operation, h) Chemical Engineering Thermodynamics i) Basic Mathematics j) Numerical Methods
8.	Metallurgical & Materials Engineering	<ul style="list-style-type: none"> a) Physical metallurgy b) Extractive Metallurgy c) Foundry Technology d) Mechanical processing e) Testing of Materials f) Polymeric and Ceramic Materials g) Composites h) Advance Materials
9.	Mining Engineering	<ul style="list-style-type: none"> a) Rock Mechanics and Rock Engineering b) Surface and Mine Environment Engineering c) Rock excavation engineering and blasting d) Drilling, Exploration and Mineralogy e) Mining Methods : Surface and underground f) Mining Machinery
10.	Applied Mechanics	<ul style="list-style-type: none"> a) Engineering Mechanics b) Strength of Materials c) Theory of Structures d) Design of Steel Structures e) Design of Concrete Structures
11.	Architecture & Planning	<ul style="list-style-type: none"> a) Architecture, Art & Design b) Building Sciences & Technology c) Issues in relation to built environment like sustainable development, behavioral aspects, cultural issues etc. d) Historical aspects of built environment e) Issues related to urban areas like Housing, Urban Design, Conservation, Planning, Infrastructure, Transportation etc. f) Fundamentals of Social Research.
12.	Physics	Syllabus as that for NET in Physics
13.	Chemistry	Syllabus as that for NET in Chemistry
14.	Mathematics	<ul style="list-style-type: none"> a) Linear Algebra, b) Real Analysis, c) Complex Analysis, d) Ordinary Differential Equations, e) Partial Differential Equations, f) Integral Transforms, g) Numerical Analysis, h) Probability & Statistics
15.	Humanities	<ul style="list-style-type: none"> a) English – Syllabus as that for NET in English b) Sociology- Syllabus as that for NET in Sociology c) Management – Syllabus as that for NET in management d) Psychology - Syllabus as that for NET in Psychology

2.0.2. AREAS OF RESEARCH (Department-wise)

S N	Department	Area of Research
1)	Mechanical Engineering	1) Design Engineering (Design and development of Industrial product, Vibration based damage detection, FEM/FEA) 2) Thermal Engineering (CFD, Convective heat transfer, Compressible flow) 3) Production and Industrial Engineering
2)	Civil Engineering	1) Water Distribution Systems 2) Environmental Management 3) Water and Waste Water Treatment 4) Solid and Hazardous Waste 5) Traffic Engg. 6) Pavement Design 7) Highway Construction Materials 8) Durability of concrete 9) High Performance Concrete 10) Self-Compacting Concrete 11) Bond Strength of Concrete with Reinforcement 12) Building Construction & Technology 13) Water Resources Engineering 14) Green Building 15) Construction Management 16) Remote Sensing & GIS Applications 17) Geotechnical Engineering
3)	Applied Mechanics	1) 1) Earthquake Engineering 2) Nonlinear Analysis of structures 3) Structural Engineering
4)	Electronics & Communication Engineering	1) Embedded Systems 2) Communication Engineering 3) Signal Processing 4) Electronics Design & Manufacturing 5) Image Processing 6) Antennas 7) Microvave Engineering
5)	VLSI & Nanotechnology	1) Embedded Systems 2) VLSI/ Nanoelectronics /MEMS 3) Communication 4) Signal Processing
6)	Computer Science	1) Parallel & Distributed Computing 2) Data Mining & Warehousing 3) Pattern Recognition 4) Security 5) Artificial Intelligence 6) Soft Computing 7) Mobile Computing 8) Knowledge Management 9) IT and IT enables services 10) Real Time systems 11) Image and Video processing 12) Data Science 13) Machine learning

		14) Internet of Things 15) Cloud Computing
7)	Chemical Engineering	Biochemical Engineering, Bio energy, Environmental engineering, waste Water Treatment, Membrane bio reactor, Physical separation, Bio pesticide and fertilizer, Process modeling and simulation, Green engineering and technology
8)	Metallurgical and Materials Engineering	1) Wear of Composite and Metallic Materials 2) Welding Metallurgy 3) Development of Polymer Blends And Composite Materials 4) Fatigue, Creep and Fracture Behavior of Materials 5) Corrosion Science & Engineering 6) Alloy Development 7) Nano – Bio Materials/ SMART Materials 8) Polymers Polymeric/Ceramics & Composite Materials 9) Processing of Materials 10) Waste Materials Utilization
9)	Mining	1) Blasting and Rock Fragmentation 2) Dust and Other Environmental Pollution in Mines 3) Slope Stability and Geo-Mechanics 4) Applicability of System Engineering and Safety Engineering 5) Reliability and Productivity Analysis of HEMM 6) Numerical Modeling for Rock Mechanics Applications 7) Mine Design
10)	Electrical Engineering	1)Power Electronics 2) Switchgear & Protection 3) Renewable Energy Resources 4) Power System 5) Electric Drives 6) Electrical Machines 7) Control System
11)	Architecture & Planning	1) Urban Planning 2) Environmental Planning 3) Disaster Risk Management 4) Urban Design 5) Urban Infrastructure 6) Architecture and Urban Conservation 7) Housing 8) Energy Efficient Architecture 9) Vernacular Architecture Settlements 10) Building Acoustics and Illumination 11) Pedagogy in Architecture 12) Built Environment and Human Behaviour Studies 13) Urban Heat Island Studies 14) Urban Sustainability 15) Universal Design
12)	Chemistry	1) Polymer Composite / Nano Composites 2) Conducting Polymers / Nanomaterial, Photocatalysis 3) Microwave / Ultrasound / Assisted Organic Synthesis 4) Utilization / Modifications of Industrial Waste- Lignin 5) Chromatographic Analysis (gc/hplc) 6) Supramolecular polymers for industrial applications

		<ul style="list-style-type: none"> 7) Chemical / Electrochemical Biosensors 8) Photochemistry and Photobiology 9) Biochemistry and Biophysical Chemistry 10) Thermodynamics Chemistry/Green Chemistry/Heterogeneous Catalysis 11) Elastometric composites 12) Porous Materials, Hybrid System for Environmental Application 13) Crystal Engineering & Supramolecular Chemistry, Organic Soft Materials and Liquid Crystals 14) Advanced Materials/SMART Materials 15) Biomaterials 16) Ceramics Materials/ Composite Materials 17) Advanced Processing 18) Simulation and Modeling
13)	Physics	<ul style="list-style-type: none"> 1) Solid Electrolytes 2) Functional Ceramics 3) Nanomaterials / Biomaterials 4) Polymers Polymeric/Ceramics & Composite Materials 5) Solar Cells 6) Sensors 7) Supercapacitors 8) Quantum dots 9) Magnetic Nanoparticles 10) Solid Oxide Fuel Cells 11) Thin films 12) Heterojunctions 13) Advanced Materials/SMART Materials 14) Physics of Materials 15) Advanced Processing 16) Simulation and Modeling, computational condensed matter 17) Theoretical and mathematical Physics 18) Quantum Mechanics and Quantum Information Theory 19) Photocatalysis 20) Photoluminescence
14)	Mathematics	<ul style="list-style-type: none"> 1) Relativity & Cosmology 2) Numerical Analysis 3) Singular Perturbation Problems 4) Fluid Mechanics 5) Operator Theory 6) Functional Analysis 7) Spectral Element Methods for Partial Differential Equations 8) Fixed Point Theory : Nonlinear Analysis 9) Singular Boundary Value Problems 10) Algebra 11) Approximation Theory 12) Algebraic Topology 13) Commutative Algebra
15)	Humanities	<ul style="list-style-type: none"> 1) Psychology 2) Sociology 3) Organizational Behavior/ HRM 4) English Language & Literature 5) Entrepreneurship Development

ANNEXURE – I

Ph.D. (full time) sponsored (place of research work VNIT only) category candidates should note that :

1. No teaching assistantship will be paid to sponsored candidates.
2. Since it is a Full Time program, the candidate is required to be available for full time in the respective department for the entire duration of the program (i.e. minimum THREE YEARS from the date of registration).

CERTIFICATE FROM THE HEAD OF THE ORGANISATION

(On the letter-head of Industry / Organization / Institute)

Shri / Ms. _____ who is serving in this Industry/Organization/Institute from _____ as (designation) _____ is hereby sponsored for Ph.D. (Full time) program in _____ Department of VNIT Nagpur. In case of his/her selection he/she will be relieved for the complete duration of the Ph.D. program (Minimum 3 years from the date of registration).

Date : _____

Signature : _____

Name : _____

Designation : _____

Office Seal : _____

ANNEXURE – II

Ph.D. (full time) sponsored candidate category from 100% centrally funded research laboratories including public sector and private industries. Candidates should note that:

1. No teaching assistantship will be paid to candidates admitted under this category.

CERTIFICATE FROM THE HEAD OF THE ORGANISATION
(On the letter-head of Industry / Organization / Institute)

Shri / Ms. _____ who is serving in this Industry/Organization/Institute from _____ as (designation) _____ is hereby sponsored for Ph.D. (Full time) program in _____ Department of VNIT Nagpur. In case of his/her selection he/she will be relieved for the completion of course work and minimum stay at VNIT, Nagpur for 6-12 months as per the condition given on page 2 section 1.1.

Date : _____

Signature : _____

Name : _____

Designation : _____

Office Seal : _____