

## ADMISSION TO THE PhD PROGRAMME (2<sup>ND</sup> SEMESTER OF SESSION 2014 -15)

- (i) A candidate seeking admission to the degree of Doctor of Philosophy must have obtained ME/MTech/MPhil/MCA/MSc/MA/MBA/CA or equivalent with minimum CGPA of 6.00 on a 10 point scale or 55% marks in aggregate where marks are awarded or NET (UGC/CSIR) qualified.
- (ii) Candidates with BE/BTech degree or equivalent with excellent academic record (minimum CGPA of 9.00 on 10 point scale or 80% marks in aggregate) may be considered for admission.

Relaxation in CGPA to 7.00 on a 10-point scale or in marks to 65% for the minimum eligibility conditions may be permitted for candidates with a BE / BTech degree or equivalent who have a minimum of 3 years of professional and/or research experience in the area in which the admission is sought. However, candidates admitted with BE/BTech or equivalent qualification will be admitted for PhD after successful completion of eight Masters level courses as suggested by the PhD Admission Committee of concerned Department/School, within a period of two years from the date of admission. A minimum CGPA of 6.00 on a 10-point scale should be earned in the courses prescribed by the concerned Department/School.

- (iii) Part-time studies leading to PhD degree are permitted for professionally employed personnel. Part-time studies leading to PhD shall also be permitted to persons working in Institutions with which a Memorandum of Understanding has been signed for research purposes. Such a candidate must be in employment at the time of admission and be engaged in professional work in the area to which admission is sought.
- (iv) **Admission of a PhD candidate in a department/ school other than his/her basic background:** Suitability of a candidate is the purview of admission committee, if a candidate qualifies the test and interview then he/she should be allowed to pursue PhD Program. However, the admission committee may recommend additional courses for the candidate to clear.
- (v) Candidates shall be admitted on the basis of merit of Entrance Test and Interview to be conducted by the University. **The candidates who secure minimum of 20% marks in the written exam shall only be called for Interview.** During interview, a candidate is required to indicate area of research.

**Relaxation for appearing in the Entrance Test may be given by the University to those candidates who have qualified UGC/CSIR (JRF).**

- (VI) Every admitted candidate shall have to do course work for a minimum of one semester. The course work shall include at least three courses, namely, a course on research methodology (may include quantitative methods and computer Applications) or a course proposed by the Admission Committee (for those who have studied a similar course on Research Methodology at PG level), a professional course (if not offered by any Department/ School, its syllabus to be proposed by the allocated supervisor and approved by DoAA) and a seminar (Relevant in the area of research). Minimum credits for the course work shall be 11 including a seminar of 4 credits. The process of registration in the course work, examination, evaluation and grading shall be same as followed for UG/PG programmes.

Only those candidates who successfully complete the course work within one year of admission and with a minimum CGPA of 6.00 on 10.00 point scale shall be registered in the PhD programme.

Every candidate will be required to submit research proposal, duly recommended by the Supervisor(s), after successful completion of the course work ( December 31 shall be taken as date of completion of course work for odd semester and June 30 shall be taken as date of completion for even semester). The minimum time period to submit the research proposal shall be **one semester** from the date of admission **and maximum time allowed to submit the research proposal shall be one year from the date of admission.**

Research proposal will be submitted to the concerned Head of the Department/School. In case of non-submission of proposal within one year, DoRSP on the recommendations of the Supervisor and Head of the Department/School may grant an extension for a maximum period of six months.

If the candidate fails to submit the proposal even during the extended period her/his admission will be cancelled. In case the proposal is rejected by the URB, she may resubmit it within next six months starting the date of meeting of URB failing which her/his admission will be cancelled

**Notes:**

- (a) Part-time candidates are required to submit the "No Objection Certificate" from their parent organization/department/employer stating that the candidate is permitted to pursue studies on a part-time basis and that the candidate's official duties permit her/him to devote sufficient time for course work and research.
- (b) In case of FN candidates, Research VISA endorsed to TU is required.

## **10.1 GENERAL INFORMATION**

TU offers PhD programme in almost all specializations of Engineering, Technology, Management and Sciences in the following Departments/Schools of the University (currently around 645 PhD candidates are working for their PhD degrees in the University).

### **DEPARTMENTS**

#### **Biotechnology Department**

Agro-Biotechnology, Plant Biotechnology, Bioremediation, Microbial Ecology, Food Technology, Food process and Safety, Plant Microbe Interaction, Tissue culture, Sustainable Agriculture, Bioinformatics, Areas of Animal Biotechnology & drug discovery and Microbial Concrete.

#### **Chemical Engineering Department**

Modeling and Simulation, Catalysis, Environment Pollution, Polymers and Composites, Mass Transfer, Bio-Chemical Engineering, Heat Transfer, Nanofluids, Nanocomposites, Pulp and Paper, Energy Management, Membrane Separation.

#### **Civil Engineering Department**

Structural Engineering, Geo-technical, Engineering, Transportation Engineering, Construction Engineering and Management and Computer Aided Design, Water Resource Engineering.

#### **Computer Science & Engineering Department**

Parallel and Distributed Computing, Software Engineering, Network and Information Security, Soft Computing, Wireless and Sensor Networks, Theoretical Computer Science.

#### **Electrical & Instrumentation Engineering Department**

Optimal Power System Operation ; Electric Drives; Application of FACTS; Power Electronics ;Process Control & Instrumentation, Artificial Intelligence Applications , Biomedical Instrumentation, Embedded systems, Virtual Instrumentation, Control System.

#### **Electronics & Communication Engineering Department**

RF Devices, Antennas and Micro-wave integrated circuits, solid State & thin films, Digital Signal processing;VLSI, Wireless Communication, Optical Communication, Opto Electronics.

#### **Mechanical Engineering Department**

Heat Transfer; IC Engines; Energy Conservation and Management; Bearings & Lubrication; Computer Aided Analysis & Design; Industrial Engineering, Robotics and Vehicle dynamics; Modelling of multibody systems; Fluid Mechanics, Technology Management, Materials and Metallurgy, Production Engineering, Manufacturing Engineering.

### **SCHOOLS**

### School of Physics & Materials Science

Solid State Physics; Materials Science; Nano Science; Liquid Crystal; Electroceramics  
Smart Materials; Magnetic Material, Condensed Matter Physics, Nuclear Physics.

### School of Behavioral Science and Business Studies

Industrial Management, Business Economics, Intellectual Property Rights, E-Business,  
Finance, Organizational Behavior, Cognitive & Experimental Psychology

### School of Mathematics & Computer Applications

Operations Research; Functional Analysis; Reliability; Fourier Analysis;  
Biomathematics; Differential Equations; Algebra; Pattern Recognition; Soft  
computing; Theory of fuzzy sets; Number Theory; Astrophysics; Grid Computing,  
Software Engineering

### School of Chemistry & Biochemistry

Analytical Chemistry, Organic Chemistry, Organometallic Chemistry, Environmental  
Chemistry, Medicinal Chemistry/Inorganic Chemistry/ Nano Chemistry/ Nano –  
Materials/ Bio-physical Chemistry.

### L M Thapar School of Management

International Business; Innovation Systems; Economics; Information Systems; Strategic  
Management; IPR; Supply chain management; Corporate Finance; Investment  
Management

### School of Energy and Environment

Environmental Technology & Management, Environmental Engineering, and  
Bioremediation.

### 10.2 Number of Seats available for second semester of session 2014-15:

Candidates are advised to browse [www.thapar.edu](http://www.thapar.edu) for updated information about  
availability of seats for PhD.

### NUMBER OF VACANT SEATS AS ON 16/10/2014.

Departments	No. of Seats	Specialization
<b>Biotechnology</b>		
	02	Microbiology/Molecular Biology
	01	Cancer Biology/ Genetics
	01	Immunology
	01	Microbiology
<b>Chemical Engineering</b>		
	01	Modeling & Simulation, Environment Production
	03	CO <sub>2</sub> Capture By Adsorption Oxo - Degradable Polyolifines
	02	Environmental Engg., Waste Water Treatment

	01	Divided Wall Column, Modeling & Simulation, Environmental Engg.
	02	Reaction Engg. Separations
	02	Adsorption For Wastewater Treatment, Membrane Separation For Wastewater Treatment
	02	Cfd, Essential Oil Production & Characterization (Experimental), Rtd And Hydrodynamics Of Pulp Digester
	02	Gas Adsorption In Porous Material, Phase Transitions In Nano Confinement
	02	Heavy Metal / Rare Earth Metal Recovery, Reactive Extraction, Biological Treatment
	01	Targeted Drug Delivery/ Biosensing, Bio-Device Fabrication, H <sub>2</sub> Production Using Photocatalysis
	02	Surfactant Enhanced Drying Of Polymer Coating, Drying Of Cross Link Polymer Coating, Drying Of Water Base Coating, Dye Removal Lxing Agri Adsorbent
<b>Civil Engineering</b>		
	2	Structural Materials
	1	Structural Health Monitoring,
	1	Water Resources Engineering, Water Management
<b>Computer Science &amp; Engineering</b>		
	01	Software creation and management, Information systems, Security and privacy, Human-centered computing, Social and professional topics
	01	Network algorithms, Computational complexity and cryptography, Design and analysis of algorithms, Information retrieval
	01	Computer systems organization, Architectures, Cloud Computing, Software and its engineering
	01	Network algorithms, Network performance evaluation, Algorithms for application domains, Machine Learning
	01	Networks, Design and analysis of algorithms, Semantics and reasoning
	01	Software engineering, Models of computation, Formal languages and automata theory, Semantics and reasoning
	01	Software functional properties, Software creation and

		management, Data management systems, Information retrieval
	01	Computer systems organization, Distributed computing methodologies
	01	Image Processing
	01	Databases, Big Data Analytics, Cloud Computing
	02	Semantics, Machine Learning, Compiler Construction, Computer Networks
<b>Electrical &amp; Instrumentation Engineering</b>		
	01	Power System and Optimization
	01	Power System Protection
	01	Biomedical Instrumentation / Cognition
	01	Biomedical instrumentation
	01	Pattern Recognition, Speaker Recognition
	01	Biometrics, Image processing
	01	Solar/Wind Power Generation, Power System Optimization
	01	Substation automation and sustainable energy
	01	Power System, Smart Grid, Renewable Energy
	01	Power System Operation and Control
	01	Digital Image Processing
	01	Power Electronics
	01	Biomedical Signal Processing, Embedded Systems
	01	Instrumentation and Control, Artificial Intelligence, Renewable energy
	01	Integration of distributed Energy Resources, Microgrid
	01	Digital Image Processing
<b>Electronics &amp; Communication Engineering</b>		
	5.5	Wireless Communication and Signal Processing
	04	Signal Processing & Applications
	05	Fiber Optical Communication
	03	VLSI Design/ CNT based VLSI interconnects
	03	Fractional order Circuits, Systems and Signal Processing
	02	Fiber Optic Communication
	02	MEMS Design & Fabrication
	03	Analog CMOS IC Design
	02	Video & Image Processing
	02	Wireless Network Security
	02	VLSI Circuits & Systems

	03	Image & Video Processing
	01	Integrated Optoelectronics
	2.5	Antennas
<b>Mechanical Engineering</b>		
	01	Design
	01	Physical Metallurgy/Materials
	01	CAD/FEM
	01	Robotics
	01	Thermal Engg.
	01	Machine Dynamics, Process Dynamics
	01	Micromachining, Advance Machining
	02	Micro/Nanofinishing
	01	Tribology, Design, Material Characterization
<b>Schools</b>		
<b>School of Physics &amp; Materials Science</b>		
	3	Condensed Matter Physic (Experimental)
	3	Nuclear Physics (Theoretical)
	2	Materials Science
	1	Particle Physics
	4	Condensed Matter Physics (Experimental)
	1	Nonlinear Optics, Photonics
	2	Thin film solar cells
<b>School of Behavioral Science &amp; Business Studies</b>		
	2	Cognitive, experimental, and Developmental Psychology
	2	Counseling and Cognitive psychology
	2	HR, General Management, Entrepreneurship
	1	Economics and Finance
	1	Management , Accounting and Finance
	2	Finance and Accounting
	2	Counseling and developmental psychology
<b>School of Mathematics &amp; Computer Applications</b>		
	02	Cloud Computing / Software Engg.
	01	Partial Differential Equations
	03	Cryptography, Data Authentication, Error Detecting and Correcting Codes
	01	Numerical Analysis of Partial Differential Equations
	02	Operations Research
	01	Fluid Dynamics
	02	Soft computing, Digital VLSI physical design automation, Combinatorial Optimization, Advanced Data Structures, Algorithms
	01	Operation Research, Mathematical Programming
	01	Number Theory, Partition Theory

	01	Operation Research
	02	Fourier Analysis
	01	Digital Image Processing, Information Security
	01	Optimization Techniques, Fuzzy set Theory
	01	Natural Language Processing (NLP)
	01	Astro Physics, Reliability
<b>School of Chemistry &amp; Biochemistry</b>		
	01	Heterogeneous catalysis
	02	Nanomaterial - Photocatalysis
	01	Bio Catalysis
	01	Organic Material Synthesis
	04	Catalysis and biofuels
	04	Bio Physical, bioinorganic and biochemistry
	02	Organic & Medicinal Chemistry
	02	Organic Synthesis & Medicinal Chemistry
	02	Organic & supra molecular chemistry
	02	Nanoscience & Nanotechnology
<b>LMT School of Management</b>		
	05	Strategy, Sustainability & Society Behavioral Decision Science Quantitative Culture Studies Academic & Corporate Leadership
<b>School of Energy and Environment</b>		
	03	Environmental Technology & Management
	01	Environmental Engg.
	01	Energy, Fuel cells

The policy of UGC guidelines regarding reservation of seats for SC/ST and PH candidates shall be followed.

**10.3** The application form along with attested copies of certificates must be submitted to the 'Incharge Admission Cell" on or before the specified dates for the odd semester and even semester. Incomplete application forms and those received after the prescribed date will not be entertained under any circumstances. No correspondence/enquiry from such candidates shall be entertained.

No separate intimation will be sent regarding conduct of exam, Interview and start of session. Application form must accompany:

- (i) Attested copies of the certificates of the examinations passed.
- (ii) One passport size photograph pasted on the application form in the space provided for the purpose.

#### **10.4 DURATION**

The student shall submit his/her thesis to the Registrar within five years but not earlier than 2.5 years in case of regular and 3.5 years in case of part time student from the date of his/her admission.



## **10.5 TEACHING ASSOCIATESHIP**

### **i Eligibility**

The associateship may be granted to candidates out of those admitted to the PhD (Regular) programme. Only those candidates will be considered who have obtained minimum CGPA of 6.75 (10.00 point scale) or first division in their qualifying examination. Teaching associateship is also available to full time Ph.D students admitted to engineering department having B.E/ B.Tech qualification under TEQIP

### **ii Number and Values of the Associateship**

Teaching Associateship are allocated to each Department/School depending upon their requirement. The numbers of Teaching Associateship vary from time to time.

Emoluments for the Teaching Associateship will be ₹13,000/- (including contingency) per month or as approved from time to time by the University.

Suitable accommodation may be provided, if available in the University on rental basis.

### **iii Duration**

The associateship will be tenable for one semester at the first instance from the date of selection, to be renewed after every semester as per requirement of the Deptt./School.

### **iv General Conditions**

A scholar who has been selected for the award will be given 8-12 hours of teaching load per week.

A scholar who has been selected for associateship shall not be eligible for any other fellowship from the University or from any other source.

A scholar who has been selected for associateship shall be liable to pay tuition fee and other dues as prescribed by the University from time to time.

## IMPORTANT DATES AND INFORMATION:

The online application form is available on [www.thapar.edu](http://www.thapar.edu). Fill the complete details and then take the **print out** of the form. Paste a recent passport size photograph on it. Please keep one copy of the printout of completely filled form as it will be required at the time of document checking during counselling. You can pay the the required amount online or attach DD (in favour of Thapar University and payable at Patiala) and send it to "Incharge Admission Cell' Thapar University, Patiala (Punjab)-147004.

### Application fee:

<b>Amount to be deposited with print out of application forms taken from website.</b>	Rs 1500
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## IMPORTANT DATES

	<b>PhD</b>
<b>Last date for receipt of completed application forms.</b>	December 1, 2014
<b>Generation of Admit Cards</b>	November 20, 2014-December 15, 2014
<b>Date of Entrance test to be conducted by TU</b>	December 19-21, 2014
<b>Display of result of Entrance Test</b>	January 1, 2015

### Admission schedule:

#### PhD Admission schedule

**Date of interview for PhD:** January 7, 2015

**Admission notification and deposit of fee for PhD program:** January 12-16, 2015

**Venue for Interview:** in respective departments/schools (9.30AM onwards)

FOR ANY OTHER DETAILS INCLUDING ELIGIBILITY CRITERIA, FEE ETC

CONTACT (08288008120, 08288008121 ) Email: <a href="mailto:admissions@thapar.edu">admissions@thapar.edu</a> Website: <a href="http://www.thapar.edu">www.thapar.edu</a>
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**IMPORTANT NOTE: Candidates are advised to regularly browse [www.thapar.edu](http://www.thapar.edu) for information/instructions regarding admissions. No separate letters shall be sent.**

All applications must be sent to "Incharge Admission Cell' Thapar University, Patiala (Punjab)-147004.

## **Documents required at the time of counselling:**

Candidates must bring with them following original certificates and **a set of attested copies of all the certificates** at the dates specified hereunder for various programmes.

- **Copy of the Application form**
- 10+2 /diploma/graduation/post graduation DMC
- Matriculation/Higher Secondary Certificate showing Date of Birth
- Result Card of Entrance Exam
- Admit Card of Entrance Exam
- Character Certificate
- Medical Fitness Certificate
- Reserved Category Certificate on the prescribed proforma and signed from the competent authority (if applicable)
- Affidavit required in case of discontinuity of studies
- Undertaking by candidates not having result of qualifying exam as per prescribed format.
- Migration Certificate
- Income Certificate
- Experience certificate & No objection certificate from employer. (For PhD candidates)
- **Check list proforma**

## INSTRUCTIONS FOR ONLINE ENTRANCE TEST

- 1 Entrance test shall be conducted ONLINE.
- 2 Candidates will be able to generate 'Admit Card' from November 20, 2014-December 15, 2014 provided their DD alongwith print out of application form reaches Thapar University in time. The login id and password created by candidate at the time of filling the application form shall be used to register for generation of Admit card.

**Note: The Admit card shall be issued provisionally to the candidate subject to his/her satisfying the eligibility condition.**

- 3 After registering, the candidate shall take out two print outs of 'Admit Card", paste latest photograph on each and then come to the entrance test centre. Alongwith admit cards, the candidate will also carry any one of the identity proof (Original) with him/her like Passport/Voter I Card/ PAN Card/ Driving License. One copy of the admit card shall be retained by the entrance test centre. The candidate shall keep the other copy (duly acknowledged by the examiner at test centre) to be shown at the time of document checking.
- 4 **The entrance test shall contain objective type questions. Other details are as under:**

SNo	Name of the programme	Duration of Entrance Test	Number of questions in the entrance test
1	PhD (for each department/school)	1.5 hours	75

- 5 While registering for ONLINE entrance test on our website, the candidate shall choose entrance test centre of his/her choice from the available list and any one slot available in the test period given above i.e. **(December 19-21, 2014)**. Once slot is chosen, it cannot be changed thereafter.
- 6 Filling of valid mobile number is mandatory.

### General Instructions:

- 1 In case of a tie among candidates securing equal marks in the merit list, the same will be broken in accordance with the following criteria:
  - (a) Candidate senior in age shall rank higher in order of merit.
  - (b) In the case of a tie in age also, a candidate getting higher percentage of marks in the qualifying examination shall be ranked higher in order of merit.
  - (c) In the case of a tie in percentage of marks in the qualifying examination also, a candidate securing higher percentage of marks in matriculation/secondary or equivalent examination shall rank higher in order of merit.

## **GENERAL INFORMATION REGARDING PhD ENTRANCE TEST**

**Duration of test: 90 minutes (75 Questions)**

1/4<sup>th</sup> mark will be deducted for each wrong answer.

### ***Syllabus for the Ph.D entrance examination***

#### **1. English & General Studies**

Interpersonal skills including communication skills,onyms/synonyms, sentence completion, active/passive voice, prepositions, direct/indirect speech, idioms & phrases. General issues on environmental ecology, biodiversity and climate change (not requiring subject specialization). Economic and social development – multilateral trade agreement, sustainable development, poverty, inclusion, demographics, social sector initiatives, etc. Indian polity and governance – constitution, political system, public policy, rights issues, etc. Indian and world geography – physical, social, economic geography of India and the world. History of India and Indian national movement. Nobel prize winners, inventions & discoveries, awards & recognitions

#### **2. Quantitative Reasoning**

Ratios and proportion, percentages, profit & loss, averages, partnership; time-speed- distance, work and time; number system, factors, multiples; pipes and cisterns, simple interest & compound interest, installment payments; clocks, calendar; in-equations, quadratic and linear equations, functions, logarithm geometry, mensuration and solid geometry, geometry (lines, angles, triangles, spheres, rectangles, cube, cone etc), co- ordinate geometry.

Set theory, measures of central tendency and dispersion, probability and theory random variables (single variable case only), probability distribution (binomial, poisson and normal), correlation & regression; permutation & combinations; maxima & minima progression; complex numbers; data Interpretation based on text, graphs (column graphs, bar graphs, line charts, Pie charts, graphs representing area) and tables.

#### **3. Analytical Reasoning & Mental Ability**

Critical reasoning, visual reasoning, assumption-premise-conclusion, assertion and reasons; statements and assumptions, identifying valid inferences, identifying strong arguments and weak arguments, statements and conclusions; cause and effect, identifying probably true, probably false, definitely true, definitely false kind of statement; linear arrangements, matrix arrangements, puzzles, family tree problem, symbol based problems; coding and decoding, sequencing, identifying next number in series, etc; tables. Basic numeracy (numbers and their relations, orders of magnitude, etc.)