

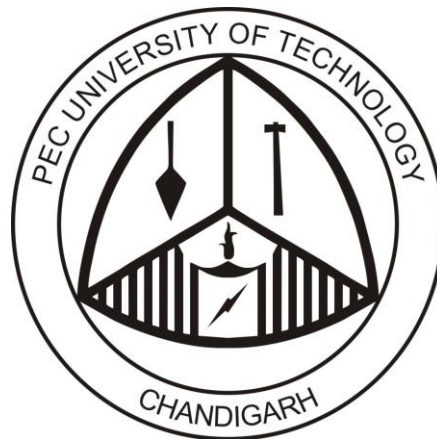


EXPLORE INNOVATE EXCEL

PEC UNIVERSITY OF TECHNOLOGY

(Formerly Punjab Engineering College)

CHANDIGARH



Admission Brochure

2017-18

Registration Fee: Rs. 2000/- (Non-Refundable)

For Admission to Ph.D. Programmes

PEC University of Technology, Chandigarh

Admission Notice

Admission to Ph.D. Programmes

Online Applications are invited for admission to Ph.D. Programmes in various disciplines as mentioned in **TABLE-1**. The important dates regarding admission related activities are mentioned in **TABLE-2**. Applications may be submitted through the link on institute website <http://pec.ac.in/admissions/phd>. Hard copy of the registration form along with self-attested photocopies of the relevant documents and a demand draft of Rs. 2000/- (non-refundable) in favor of “*PEC University of Technology – PG Admissions*” payable at **Chandigarh** is to be submitted to Controller of Admissions, PEC University of Technology, Sector – 12, Chandigarh, Pin – 160012 by hand /registered post/ speed post on the prescribed date and time. The candidates applying for more than one department should submit separate print-outs of online registration form on website <http://pec.ac.in/admissions/phd> for each discipline. A sum of Rs.500/-(non refundable) is to be paid as registration fee for each additional discipline applied.

TABLE-1

Area of Specialization and Qualifying Degree for PhD Admission for the session 2017-18

S.No	Department	Area of Specialization	Qualifying Degree, eligible branches	With Institute Scholarships	Without Institute Scholarship	Total
1.	Aerospace Engineering	<ul style="list-style-type: none"> • Aircraft Propulsion • Experimental Aerodynamic 	B.E. / B.Tech. / M.E. / M.Tech. in <ul style="list-style-type: none"> • Aerospace Engineering • Aeronautical Engineering • Mechanical Engineering 	02	00	02
2.	Applied Sciences	Physics <ul style="list-style-type: none"> • Magnetic Semiconductor • Multiferroics (Nanomaterials) • Pyroelectricity • Theoretical condensed matter Physics 	<ul style="list-style-type: none"> • M.Sc. Physics • M.Sc. Material Science • B.E. / B.Tech. / M.E. / M.Tech. in Material Science • B.E. / B.Tech. / M.E. / M.Tech. in Material and Metallurgy Engineering • B.E. / B.Tech. / M.E. / M.Tech. in Nano Technology • B.E. / B.Tech. / M.E. / M.Tech. in Electronics Engineering 	02	6	8
		Mathematics Section <ul style="list-style-type: none"> • Number Theory • Algebra • Coding Theory • Topology 	<ul style="list-style-type: none"> • M.Sc. in Mathematics 	02	14	16

		<p>Chemistry</p> <ul style="list-style-type: none"> • Synthetic Organic Chemistry (Bioactive molecules), Green Chemistry, nanocatalysis, Photocatalysis, Waste Water Treatment Nanomaterial • Organotin Chemistry, Environmental Chemistry, Nanomaterials • Analytical Chemistry 	<ul style="list-style-type: none"> • M.Sc. in Chemistry, • M.Sc. Applied/ Industrial Chemistry • M.Sc. Environmental Sciences • B.E. / B.Tech. / M.E. / M.Tech. in Chemical Engineering • M.Sc. Material Science • B.E. / B.Tech. / M.E. / M.Tech. in Environmental Engineering • B.E. / B.Tech. / M.E. / M.Tech. in Material Science • B.E. / B.Tech. / M.E. / M.Tech. in Material and Metallurgy Engineering • M. Pharma 	03	9	12
		<p>Geology Section</p> <ul style="list-style-type: none"> • Remote sensing and GIS applications to Geological studies. 	<ul style="list-style-type: none"> • M.Sc in Geology • B.E. / B.Tech. / M.E. / M.Tech. in Geology 	--	03	03
3.	Computer Science & Engineering	<ul style="list-style-type: none"> • Information Security and Cyber Warfare • Crowd Sensing and Mobile computing • Image Processing • Fault- Tolerant Distributed Computing • Bio-Informatics • Focused Web Crawlers • Software Plagiarism Detection • Geographical Information systems 	<p>B.E. / B.Tech. / M.E. / M.Tech in</p> <ul style="list-style-type: none"> • Computer Science & Engineering • Information Technology • Software Engineering • Information Security • Electronics & Communication Engineering • Embedded System • CSE (Computer networks) • Information Systems • Electrical & Communication Engineering <p>Or equivalent</p>	04	9	13
4.	Civil Engineering	<ul style="list-style-type: none"> • Structural Engineering • Transportation Engineering • Water Resources Engineering • Environmental Engineering • Geotechnical Engineering • Construction Technology & Management • Remote Sensing and GIS 	<p>B.E. / B.Tech. / M.E. / M.Tech in</p> <ul style="list-style-type: none"> • Civil Engineering or any allied field 	05	42	47
5.	Electronics Comm Engineering	<ul style="list-style-type: none"> • Optical communication & Photonics • Communication Engineering • Nano Technology • Electronics Waste Management • Assistive technology • Digital communication • Computer aided diagnostics • Digital signal processing • Embedded system • Image processing • Electronics system design 	<p>B.E. / B.Tech. / M.E. / M.Tech in</p> <ul style="list-style-type: none"> • Electronics Engineering • Electronics & Communication Engineering • Electronics and Telecomm Engineering • Electronics and Instrumentation Engineering • Electronics (VLSI) • Electronics Product Design & Technology • Embedded System 	06	21*	27

		<ul style="list-style-type: none"> • Microwave / Terahertz (THz) Antennas and devices • Renewable energy • Cognitive radio • VLSI Design • Wireless Communication • Silicon Nano Photonics • On-chip optical devices • Photonics Integrated circuits • Optical networks – on –chip 	<ul style="list-style-type: none"> • Microelectronics • Power electronics • Microwave Engineering • Computer Aided Design • Biomedical Engineering <p>Or any other equivalent</p>			
6	Electrical Engineering	<ul style="list-style-type: none"> • Power System Engineering • Energy System Engineering • Control Engineering • Power Electronics & Drives 	B.E. / B.Tech. / M.E. / M.Tech in <ul style="list-style-type: none"> • Electrical Engineering • Power Systems • Electrical & Electronics • Power Electronics & Drives • Control & Instrumentation 	02	07*	09
7.	Mechanical Engineering	Mechanical Vibrations & Its control, Thermal Engineering, quality Control, Green Manufacturing, Solar Energy, Advanced Manufacturing process, welding, composites	B.E. / B.Tech. / M.E. / M.Tech in <ul style="list-style-type: none"> • Mechanical Engineering • Aeronautical Engineering • Production Engineering • Production & Industrial Engineering • Aerospace Engineering 	02	5*	7
8.	Materials & Mett. Engineering	<ul style="list-style-type: none"> • Biomaterials for Bone Substitute and Body Implant • Materials for Joining processes • Blast Mitigation • Composite Material • Thin film • Transparent ceramic 	B.E. / B.Tech. / M.E. / M.Tech in <ul style="list-style-type: none"> • Mechanical Engineering • Production Engineering • Metallurgy/ Materials and relevant fields 	00	03	3
9.	Production and Industrial Engineering	<ul style="list-style-type: none"> • Machining & Adv. Mfg. • CAD/CAM/Casting welding • Non Conventional Machining • Quality • DOE • ECDM 	B.E. / B.Tech. / M.E. / M.Tech in <ul style="list-style-type: none"> • Production and Industrial Engineering • Mechanical Engineering • Industrial Design • Metallurgy • TQEM/ TQM • Production Engineering • Industrial Engineering 	02	01	03
10.	Industrial Product & Design	<ul style="list-style-type: none"> • Ergonomics, Advanced CAD • Design Application in Medical Sciences 	B.E. / B.Tech. / M.E. / M.Tech in <ul style="list-style-type: none"> • Mechanical Engineering • Production and Industrial Engineering • Industrial Design • Production Engineering • Industrial Engineering • Electronics Engineering • Electronics & Communication Engineering 	02	01	03
11.	Centre of Management and Humanities	<ul style="list-style-type: none"> • Finance 	M.Com/MBA or equivalent	01	01	02

** The FHBTL will institute two research fellowships , named here as Battery Research Fellowships, as per prevailing UG and university guidelines, one in the area of Electrical Engineering and in the area of*

either Electronics & communication engineering or Mechanical Engineering department, w.e.f. academic session 2017-18. The students will be admitted as per the exiting admission processes of the university. The term of the fellowship will be three years. If the work is found satisfactory, it may be extended upto further period with mutual agreement between the two parties.

Note:

1. Only GATE qualified candidates are eligible for admission to Ph.D. programme in Mechanical, Computer Science & Engineering and Materials & Metall. Engg. departments.
2. Entrance test will be conducted for non-GATE candidates by the respective departments followed by interview. For GATE candidates, only interview will be conducted.
3. The schedule of written test and interview will be notified separately on the institute website.
4. The candidates are advised to visit the institute website regularly.

TABLE-2: Important Dates
Admission Schedule for Ph.D Admissions 2017-18

Online Registration	12.06.2017 to 23.06.2017 (09:00 AM to 05:00 PM)
Last date for depositing hard copy of Registration Form along with Demand Draft and supporting documents	28.06.2017 till 05:00 PM
Dispatch of Registration Form to various Departments	03.07.2017
Publishing of final list of eligible candidates by respective Departments	07.07.2017
Admission test and interview in respective departments	17.07.2017 and 18.07.2017
Date of result intimation with waiting list	20.07.2017
Payment of fees (Fee should be in the form of DD in favour of “PEC University of Technology – PG Admissions” payable at Chandigarh)	20.07.2017 to 21.07.2017
Reporting of new PhD students in the respective departments and selection of tentative topics, guide/ supervisors	24.07.2017
Academic Registration	26.07.2017

PEC University Of Technology, Chandigarh

I. OBJECTIVE OF THE PhD PROGRAMME

The PEC University of Technology has a mission to develop high quality science and engineering specialists having strong base in principles of science and the scientific methods, deep understanding of their chosen areas of specialization, the motivation to learn continually, interact with multi-disciplinary groups and to handle new challenges offered by the front-end technologies.

The PhD programme is designed to impart knowledge, consolidate concepts and intellectual skills through courses, seminars, projects, and thesis work. Above all, it helps the scholars to develop the capacity for free and objective enquiry, courage and integrity, awareness and sensitivity to the needs and aspirations of the society.

The programme provides the candidates an enabling research experience during their stay in the institute thus helping them to enter their professional life with right perspective and knowledge related to their respective fields of specialization.

II. Areas of Research

The Ph.D. Programme can be pursued in the disciplines of Applied Sciences, Civil Engineering, Electrical Engineering, Mechanical Engineering, Production & Industrial Engineering, Computer Science & Engineering, Aerospace Engineering, Materials & Metallurgical Engineering, Electronics and Communication Engineering and Industrial and Product Design. The institute encourages inter-disciplinary research across various departments.

III. Admission to Ph.D. Programme

Admission to the PhD programmes is made on the basis of interview or written test (GATE/NET syllabus) or both as determined by PhD Admission Committee of the Department provided the candidate fulfils all the requirements at the Institute level and the selected candidate deposits the requisite fees for the PhD Programme. The applications received will be processed in the various departments for written test/interview.

Internal faculty/staff members who are GATE/NET qualified, will be eligible for admission through interview only, while Non GATE/non NET candidates will be admitted through interview and written test.

The admission to Ph.D. programme will take place once a year. However, students having National/ State/ Industry/ R&D sponsored scholarship such as UGC NET/ CSIR NET/ DSP inspire/ Vishvesveraya etc. & related scholarships or are sponsored foreign nationals can

be given admission throughout the year based upon an interview to be conducted by Departmental Research Committee (DRC) & prospective supervisors.

The Ph.D admission committee of the department will consist of Head of the department, members of DRC and potential supervisors in various areas.

IV. Categories of Ph.D. Programme Admissions

The applicant for admission to the Ph.D. programme shall be classified under any one of the following categories which will be decided and recommended by the Ph.D admission committee of the department.

(i) Full-time Research Student/Candidate (with/without Scholarship and sponsored)

- a) Research student with valid GATE/NET score or admitted to M.E. with GATE and getting Institute assistantship.
- b) Research student including foreign nationals getting financial support from Govt. / Semi Govt. agencies (QIP, CSIR, UGC, DAE, DST, DBT, NBHM, JEST, ICCR, NDF, DRDO, etc.)
- c) Research student on study leave: This category refers to persons who are released from government or educational institutions on study leave for a period of not less than three years for pursuing Ph.D. programme. They will be admitted along with the regular research students through the usual admission procedure.
- d) Self-Financed Research student/Candidate
—**Indian:** This category refers to persons with experience and with good track record to join the doctoral programme. They will be admitted along with the regular research students through the usual admission procedure.
—**Foreign:** Admission of Foreign nationals to Ph.D. programme will be made as per policy and direction of the Govt. of India from time to time.
- e) Research student working full time (JRF/SRF/RA) in a sponsored R & D project at PEC provided his Ph.D. topic is related to the project as certified by the SRC six months after joining the project. To be accepted as a Ph.D. student, a research student working in a project will have to undergo the same admission procedure as applicable in general. These students would also be eligible for institute assistantship on lines of students admitted under (a) above.

(ii) Part-time Research Student/ Candidate (sponsored)

- a) Research student/Candidate working as a regular employee in the institute.
- b) Research student/Candidate working as a regular employee in research organization like DRDO/ CSIR etc and scientist/faculty working in the CRIKC institutes will be eligible for admission to PhD Programme as a Part-Time Scholar provided he/she is in continuous service for the last 2 years in the same organization and can provide a No objection certificate from the employer. The DRC has to ensure the fulfillment of these conditions at the time of interview.
- c) Research student / candidate working regularly full-time in an R&D project in the institute can join as a full time/part time student if his Ph.D. topic is related/not related to the project as certified by the SRC six months after joining the project However, part time research student/candidate may be given full time status when the project tenure is completed. To be accepted as a Ph.D. student, a research student working in a project will have to undergo the same admission procedure as applicable in general.

V. Eligibility Criteria for Admission to Ph.D. Programme

1. Eligibility for Full-time Research Student/Candidate

An applicant belonging to the above admission categories should possess the following qualifications in appropriate areas to be eligible to apply for admission for the Ph.D. programme of the Institute.

a) Engineering Technology streams:

Master's degree in Engineering/ Technology of 2 years duration after graduation in respective discipline or equivalent with a minimum Cumulative Grade Point Average (CGPA) of 6.00 on a 10 point scale or equivalent as determined by the Institute wherever letter grades are awarded; or 60% marks in aggregate (of all the years/semesters) where marks are awarded.

Details of direct admission of B.E/B.Tech. candidates to Ph.D programme are given in section 3.

b) Science/ Humanities & Social Science, Management Streams:

Master's degree in Sciences/Humanities & Social Sciences/ Management in respective discipline or equivalent and minimum Cumulative Grade Point

Average (CGPA) of 6.00 on a 10 point scale or equivalent as determined by the institute where letter grades are awarded; or 60% marks where marks are awarded.

- c) The admission eligibility requirements may be relaxed to 5.5 on a 10 point scale or equivalent, or to 55% marks for admission in all categories of scholars for the following categories:
 - i) SC/ST candidates
 - ii) PwD (Persons with disability)

2. Eligibility for Part-time PhD

- a) The eligibility criteria shall be the same as that for full time students. Additionally, the part time candidates need to fulfill the following conditions and provide the information along with the application:
 - i.) The applicants must have been in continuous service with the sponsoring organization for at least two years at the time of submitting the application form for admission and submit 'No Objection Certificate' from the employer stating that (i) He/she is on the regular payroll of the organization, (ii) He/she is permitted to pursue studies on a part-time basis, and (iii) His/her official duties will permit sufficient time for research. Sponsorship letter (on letterhead of the sponsoring organization) should include an undertaking stating that the period of study of the candidates will be treated as 'on duty' with usual salary/allowances, and he/she will be relieved for the period of studies.
 - ii.) He / She will be required to reside at the Institute for a period of not less than one semester i.e. six months duration which is mandatory in the first year of PhD Programme. (This condition of minimum residence period will be automatically waived for candidates who are working in PEC or in organizations / institutions located within a distance of 50 km from the Institute).

Note: Prevailing guidelines on course work for Ph.D part-time programme and options for Senior Executives working at the level of CEOs and Directors in industries, Government and research organizations are available in Ph.D Rules and Regulations of the institute.

3. Direct Admission of B.E./B.Tech. candidates to Ph.D programme

- a) All candidates having BE / B. Tech degree would be eligible for admission to Ph.D. program

- b) To be eligible for the admission under this category, a candidate is required to have minimum CGPA of atleast:
 - i. 9.0 (on a scale of 10) at the end of the seventh semester (if applying during final year) under OPEN category.
 - ii. 9.0 (on a scale of 10) at the end of the eighth semester (if applying after the completion of B.Tech) under OPEN category.
 - iii. For SC/ST category students, the minimum CGPA requirement will be relaxed to 8.5.
- c) Candidates should have a valid GATE/NET score. Selection to program would be made on the basis of GATE/NET score and interview.
- d) Successful candidates in final year of undergraduate programme may be given provisional admission to the Ph.D programme. This admission shall be confirmed provided the student completes his/her undergraduate programme with required graduation CGPA.
- e) Candidates getting direct entry to Ph.D programme after BE/ B.Tech will need to fulfill credit requirements through course work on pattern of courses offered to PG students and additional course requirements as per UGC

VI. Scholarship:-

Institute scholarships are available for GATE Qualified students in some departments as shown in **TABLE-1**.

VII. Submission of Application form

Application for admission must be filled online (procedure for online registration mentioned in point VIII) and a printed copy of the filled registration form along with following documents must be sent to Controller of Admissions, PEC University of Technology, Sector – 12, Chandigarh – 160012 on or before the closing date as mentioned in Table-2:

- I. Date of Birth Certificate
- II. SC/ST Certificate (if applicable)
- III. Sponsorship/NOC Certificate (wherever applicable)
- IV. GATE Score Card (if applicable)
- V. Copies of Bachelor's & Master's Degrees along with marks sheets
- VI. Migration Certificate (For candidates not having their Master's degree from PEC University of Technology)
- VII. Persons with Disabilities certificate (if applicable)
- VIII. Demand Draft in original.
- IX. Undertaking if applicable

NOTES:

1. Reservation of seats for SC/ST/PwD candidates shall be provided as per Govt. norms applicable from time to time.
2. Full-time candidates with scholarship coming on study leave must show proof of at least 3 years study leave before being allowed to register after the selection.
3. In case an eligible degree does not bear the awards in percentage, the following Conversion Formula will be used to convert CGPA into percentage of marks for the purpose of admission at PEC: Percentage of Marks = CGPA x 10, on 10-Point Scale.
4. The minimum prescribed percentage will be based on the marks obtained in aggregate of all the years/ semesters of the qualifying examinations as per the weightage followed by the concerned University.
5. The attendance of full-time PhD candidates will be governed by the attendance requirements of the Institute.
6. Part-time PhD candidates will be required to meet the supervisor at least once every fortnight throughout the semester. Attendance record should be maintained with the supervisor and office of the Department.
7. All Non-GATE/Non-NET qualified candidates have to qualify a PhD entrance exam of the Institute. However, M.E. students who were admitted to M.E. on basis of GATE score are exempt from the PhD entrance exam of the Institute.
8. For admission to PhD Programmes in Science/Humanities/Management, if the candidate does not have a NET Fellowship (UGC/ CSIR) valid for the current year in relevant areas, the candidates has to qualify the PhD Entrance Test of the institute.
9. Only the predetermined number of students may be admitted to a PhD programme.
10. As per the provisions 1(5) of the UGC Regulations 2009, PhD program will not be conducted through distance education mode.

VIII. Procedure for online Registration

Online Submission of application for Registration on <http://pec.ac.in/admissions/phd>.

Please read the general instructions carefully before starting the registration process. The candidates are required to pay Rs.2000/- (non-refundable) in the form of Demand Draft/Bankers Cheque in favor of "*PEC University of Technology – PG Admissions*" payable at **Chandigarh** and sum of Rs.500/- (non refundable) is to be paid as registration fee for each additional discipline applied. The details of Demand Draft/Bankers Cheque are to be filled during online registration.

The process of online registration consists of three steps. The candidates seeking admission are required to fill online Registration Form.

1. **Step 1:**

- 1.1 Enter a valid email address and other personal details.
- 1.2 On submission a system generated username & password will be displayed on the screen. Note down this username and password for future reference.

2. **Step 2:**

- 2.1. Enter the academic qualifications.
- 2.2. The candidate then has to upload the scanned images of Photograph and Signature.
- 2.3. All Scanned images should be jpg/jpeg format only.
- 2.4. Size of the photograph image must be greater than 4kb and less than 200kb. The photograph should preferably have the frontal face with a light background.
- 2.5. Size of the signature image must be greater than 4kb and less than 100 kb.
- 2.6. Dimension of photograph image should be 200x150(height x width) pixels only.
- 2.7. Dimension of signature image should be 100 x 200 (height x width) pixels only.
- 2.8. The details of the Demand Draft/Bankers Cheque are to be filled in the Registration Form.
- 2.9. The candidates have to select their choices of area of specialization in order of their preference.
- 2.10. In case of a GATE qualified candidate, mention GATE details.
- 2.11. Mention number of papers published and awards and scholarship, if any.
- 2.12. Mention any other relevant information.
- 2.13. After successful completion the registration form and choice filling, a confirmation page will be generated.

3. **Step 3:**

- 3.1 The candidates are advised to take 2 printouts of the confirmation page and send the one copy of print-out along with documents and Demand Draft/Bankers Cheque (in original) to following address by hand/speed post/registered post so as to reach by the prescribed date.

<p>Controller of Admissions, PEC University of Technology Sector-12, Chandigarh Pin – 160012</p>
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- 3.2 The institute will not be responsible for any delay in the receipt of hard copy of the Registration Form.

- 3.3 The candidates are advised to keep one copy of the confirmation page with them for future reference.

IX. GENERAL INSTRUCTIONS

1. Separate Registration form should be used for each department if applying for more than one department.
2. Self attested copies of relevant certificates are to be enclosed.
3. Candidates should bring original certificates along with the Master's Thesis at the time of interview.
4. The filled Registration form must reach the Controller of Admissions, PEC University of Technology, Sector – 12, Chandigarh - 160012 before the due date.
5. Name of the department in which the admission is sought should be super-scribed on the envelope.

X. CHECK LIST

The self-attested photocopies of the following documents (whichever applicable) are required to be enclosed with the copy of confirmation page in sequentially:-

1. Date of Birth Certificate
2. SC/ST Certificate
3. Sponsorship/NOC Certificate/letter indicating applied for NOC wherever applicable
4. GATE Score Card if applicable
5. All Mark-sheets and Degrees
6. NET Certificate if applicable
7. Migration Certificate
8. Persons with Disabilities certificate (if applicable)
9. Demand Draft in original.
10. Undertaking if applicable

UNDERTAKING FOR CANDIDATES WHOSE RESULT IS NOT DECLARED

I hereby certify in connection with the application of Mr./Ms. _____ that he/she is a bonafide student of our institution and is applying for admission to Ph.D. programme(s) at PEC University of Technology, Chandigarh. He/She has completed the requirements of qualifying examination including theory papers, practical and project/dissertation examination for M.E/M.Tech./M.Sc./M.A.

_____ (Strike out the non-applicable ones and write in the blank space if the degree is not mentioned). The percentage of aggregate marks/CGPA obtained by him/her upto pre-final Semester/year examination (Strike out the non-applicable) is _____ His/her conduct and character during his/her stay at the Institute/University is "GOOD".

Place: _____

Date: _____ Signature of Principal/Dean/Registrar/

Dy.Registrar/Proctor/Administrative Officer
/ Asstt. Registrar of the institute
attending/last attended with seal

FEE STRUCTURE FOR Ph.D. STUDENTS

ONE-TIME (At Admission only)

Admission Fee	:	Rs. 3000/-
Student services	:	Rs. 5000/-

RECURRING (Annual)

Tuition Fees	:	Rs. 5000/-
Other facilities & services	:	Rs. 10000/-

SECURITY (Refundable)	:	Rs. 5000/-
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The other facilities and services fee will not be payable by students who are pursuing the programme on a part-time basis.

Every component of fees is subject to revision by PEC University of Technology, Chandigarh from time to time.