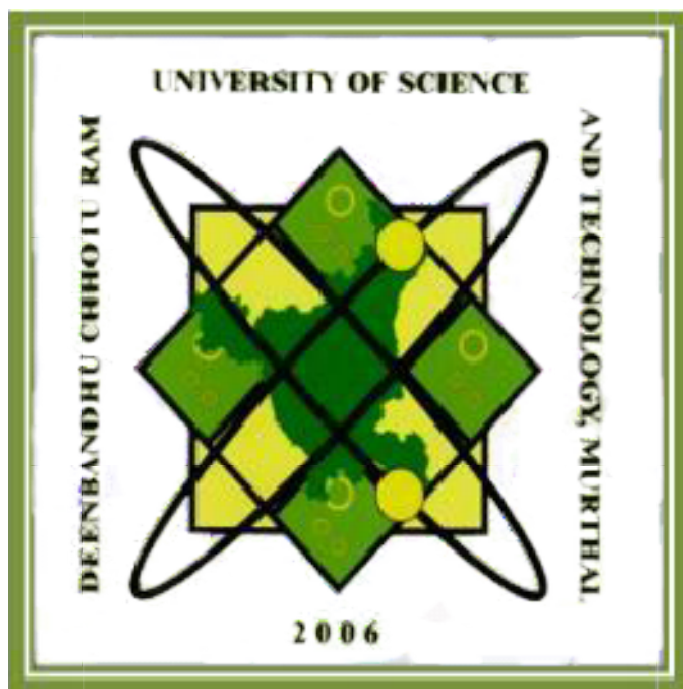


# Ph.D. PROSPECTUS

(July 2023)

Odd Semester



**DEENBANDHU CHHOTU RAM UNIVERSITY  
OF  
SCIENCE & TECHNOLOGY  
MURTHAL (SONEPAT), HARYANA-131039**

(Established by State Legislative Act 29 of 2006 & approved under Section 12 (B) & 2 (f) of UGC Act, 1956)

(NAAC 'B++' Grade State University)

[www.dcrustm.ac.in](http://www.dcrustm.ac.in)

2023-24

# **OFFICERS OF THE UNIVERSITY**

## **HON'BLE CHANCELLOR Sh. Bandaru Dattatreya, Governor - Chancellor, Haryana**

<b>Vice-Chancellor</b>	<b>Prof. (Dr.) Rajendrakumar Anayath</b>	
<b>Registrar</b>	<b>Prof. Suresh Kumar</b>	<b>0130-2484005</b>
<b>Dean Academic Affairs</b>	<b>Prof. R.C. Nautiyal</b>	<b>0130-2484024</b>
<b>Controller of Examinations</b>	<b>Dr. M.S. Dhankhar</b>	<b>0130-2484006</b>
<b>Dean of Colleges</b>	<b>Prof. Ajay Monga</b>	<b>130-2484060</b>
<b>Dean Students' Welfare</b>	<b>Prof. Sukhdip Singh</b>	<b>0130-2484200</b>
<b>Proctor</b>	<b>Prof. Manoj Duhan</b>	<b>0130-2484010</b>
<b>Chief Warden (Boys)</b>	<b>Prof. Vijay Kumar Sharma</b>	<b>0130-2484102</b>
<b>Chief Warden (Girls)</b>	<b>Prof. Anita Singhrova</b>	<b>91-9416410568</b>
<b>Controller of Finance</b>	<b>Dr. Sanjeev Indora</b>	<b>0130-2484104</b>
<b>Director. R&amp;D Cell</b>	<b>Prof. Satish Khasa</b>	<b>91-9812818900</b>

## DEANS/CHAIRPERSONS/ HEADS OF DEPARTMENTS/ CENTRES

Deans of Faculties	Phone No. 0130	Departments		Chairperson	Phone No. 0130
Prof. Parveen Kumar, Faculty of Architecture, Urban and Town Planning	2484023	Architecture		Prof. Parveen Kumar	2484040
Prof. D.K. Jain Faculty of Engineering and Technology	2484124	1	Bio-Medical Engg.	Dr. Seema Chawla	2484201
		2	Civil Engg.	Dr. Gyanender Singh	2484147
		3	Electrical Engg.	Prof. Surender Dahiya	2484124
		4	Elect. & Comm. Engg.	Prof. Priyanka	2484146
		5	Mech. Engg.	Prof. Avdhesh Kumar	2484125
Prof. Anita Rani Faculty of Information Technology & Computer Science	2484137	Computer Sci. and Engg.		Prof. Sukhdip Singh	2484137
Prof. Rekha Faculty of Humanities & Social Sciences	2484028	Humanities		Prof. Sujata Rana	2484028
Prof. Anil Khurana Faculty of Management Studies	2484126	Management Studies		Prof. Anil Khurana	2484126
Prof. Kiran Nehra Faculty of Non- Conventional Sources of Energy and Environmental Science	2484128	Bio-technology		Prof. Kiran Nehra	2484128
		Chemical Engg.		Prof. Brijnandan Singh Dehiya	2484123
		Center of Excellence for Energy and Environmental Studies		Prof. A.K. Berwal	2484037
Prof. Sudhir Batra Faculty of Science and Technology Interface	2484121	Chemistry		Prof. Suman Lata	2484148
		Mathematics		Prof. Navneet Hooda	2484121
		Physics		Prof. Rajni Shukla	2484127
Prof. Sukhdip Singh Faculty of Education	2484024				

## **Ph.D. PROSPECTUS: 2023-24 (Odd Semester)**

Deenbandhu Chhotu Ram University of Science & Technology, Murthal offers research programmes in its Departments/Centers leading to the award of Degree of Doctor of Philosophy (Ph.D.). The award of Ph.D. degree is in recognition of high academic achievements, independent research and application of knowledge to the solution of technical and scientific problems in Science, Technology, Architecture, Management and Humanities. The procedure and requirements spelled out in Ordinances and Regulations embody the philosophy to ensure high standards of performance in research work at the University. Notwithstanding these Ordinances and Regulations, various Departments and Centers may require the candidates to complete additional requirements so as to serve their particular academic goals. Ph.D. degree of Deenbandhu Chhotu Ram University of Science & Technology, Murthal shall be conferred on a candidate who fulfills the requirements specified in the Ordinances and Regulations.

This prospectus shall be applied to Ph.D. Programme July 2023 and onwards offered by this University in the supersession of Ph. D. prospectus 2022-23 odd semester and prepared in accordance with University Grants Commission (Minimum Standards and Procedures for Award of Ph.D. Degree) Regulations, 2022.

### **1. ELIGIBILITY CRITERIA FOR ADMISSION**

The following are eligible to seek admission to the Ph.D. programme:

- 1.1.1 A 1-year/2-semester Master's degree programme (after 4 year undergraduate degree) with at least 55% marks in aggregate or its equivalent grade 'B' in the UGC 10- point scale (or an equivalent grade in a point scale wherever grading system is followed) or an equivalent degree from a foreign educational institution accredited by an Assessment and Accreditation Agency which is approved, recognized or authorized by an authority, established or incorporated under a law in its home country or any other statutory authority in that country to assess, accredit or assure quality and standards of educational institutions.
- 1.1.2 A 2-year/4-semester Master's degree programme, with the same conditions as in sub clause 2.1.1 above;
- 1.1.3 A candidate seeking admission after a 4-year/8-semester Bachelor's degree with Research should have a minimum CGPA of 7.5/10.

- 1.2 Candidates who have cleared the M.Phil. course work with at least 55% marks in aggregate or its equivalent grade 'B' in the UGC 10-point scale (or an equivalent grade

in a point scale wherever grading system is followed) or an equivalent degree from a Foreign Institution accredited by an Assessment and Accreditation Agency which is approved, recognized or authorized by an authority, established or incorporated under a law in its home country or any other statutory authority in that country to assess, accredit or assure quality and standards of educational institutions, shall be eligible for admission to the Ph.D. programme.

1.2.1 A person whose M.Phil. dissertation has been evaluated and recommended for award of the degree, may be admitted to the Ph.D. programme in any Institution on a provisional basis even before the viva-voice or final defence.

1.3 A relaxation of 5% of marks, from 55% to 50%, or an equivalent relaxation of grade, may be allowed for those belonging to SC/ST/OBC (non-creamy layer)/Differently-abled, Economically Weaker Section (EWS) and other categories of candidates as per the decision 3 of the Commission from time to time, or for those who had obtained their master's degree before 19th September 1991. Note: The eligibility marks of 55% (or an equivalent grade in a point scale wherever grading system is followed) and the relaxation of 5% to the categories mentioned above are permissible based only on the qualifying marks without including the grace mark procedures, if any.

1.4 A relaxation of 0.5 score, i.e. CGPA of 7/10 or an equivalent relaxation of grade may be allowed for those belonging to SC/ST/OBC (non-creamy layer)/Differently-abled, Economically Weaker Section (EWS) and other categories of candidates as per the decision of the Commission from time to time

*As per Govt. letter no. 42/158/2016-5GS1 dated 19.01.2018 issued by the chief secretary to Govt. of Haryana, the candidates who have obtained degrees/diploma through distance education mode after getting enrolled during 2001-2005 and also who were admitted after the academic session 2001-2005, their degrees/diploma are to be treated as cancelled. Accordingly, such degrees/diploma will not be considered for admission purposes.*

*MHRD, Govt. of India, through an order (vide OM no. 11-15/2011-AR (TS.II) dated 06.12.2012) withdrew the recognition granted to all certificates/ qualifications awarded by professional bodies/institutions in the field of technical education. The MHRD further stipulated that from 01.06.2013 onwards the courses for equivalence will cease (Refer AICTE Letter F. No.2-PC/ACITE/Gen. Dust, Edu. Policy/2018/439 Dated: 23.08.2018).*

## 2. DURATION OF THE PROGRAMME

Ph.D. programme shall be for a minimum duration of three years, including coursework and a maximum of six years **(during this period, no approval of extension is required)**

from the date of admission to the Ph.D. programme. For further details, refer to DCRUST Ph.D. ordinance-Jan 2023.

### 3. ADMISSION PROCESS

3.1.1. Admission notice seeking applications for Ph.D. programme shall be issued once or twice in a year.

3.1.2. Numbers of seats (Slots) available for admission in different Departments are given below.

S. No.	Name of the Department	Ph. D. Slots
1.	Architecture	08
2.	Bio Technology	03
3.	Bio-Medical Engg.	07
4.	Civil Engg.	05
5.	Chemistry	03
6.	Chemical Engg.	13
7.	Centre of Excellence in Energy & Environment Studies	05
8.	Computer Science & Engg.	19
9.	Electronics & Comm. Engg.	25
10.	Electrical Engg.	11
11.	Humanities (English)	03
12.	Management Studies	08
13.	Mathematics	00
14.	Mechanical Engg.	22
15.	Physics	06

**3.2. Haryana State reservation policy will be followed to distribute the total number of slots and is subject to any change/amendments by the State Governments from time to time.**

For the distribution of slots, refer to the seat matrix given at **page no. 16**.

- i. Only the candidates having a permanent disability of not less than 40% (being otherwise fit for the admission of the course) will be considered for admission as physically handicapped. A disability certificate must be issued by the Chief Medical Officer of the concerned District.
- ii. In the event of quota reserved for physically handicapped remain unutilized due to non-availability for suitable category of handicapped candidates, it may be offered to

the Ex-Serviceman and their wards (1%) and the dependents of Freedom Fighters (1%).

- iii. Vide Notification No. 808-SW (1) dated 17 August, 2016 issued by Welfare of Scheduled Castes and Backward Classes Department, Haryana, the criteria for exclusion of creamy layer within the Backward Classes as per the Schedules appended to the Act, namely Scheduled I, II & III will be as under:-

**“ The Children of persons having gross annual income of upto three lakh rupees shall first of all get the benefit of reservation in services and admission in educational institutions. The left out quota shall go to that class of Backward Classes of citizens who earn more than Three Lakh rupees but upto Six Lakh rupees per annum. The sections of the Backward Classes earning above Six Lakh rupees per annum shall be considered as Creamy Layer under section 5 of the said Act.”**

- iv. CWP No. 3220 of 2019, Rakesh Dhundhara Vs Union of India and others are pending in Hon'ble Supreme Court regarding 10% reservation granted to the economically weaker section in admission by Govt.
- v. Conversion of reserve seats into All India Category / Open General Category is not permitted. However, the merging of sub-categories like BC(A) & BC(B) and SC & DSC are permitted if candidates are not available in the sub-category/ list exhausted.
- vi. EWS quota: These seats are the part of HOGC in Ph.D seat matrix. In case, candidate is not available in EWS category then these seats may be filled from the HOGC candidates
- vii. Reserve category candidate(s) are also eligible in General Category (AIC / HOGC) provided that they scored marks in qualifying examination  $\geq$  the marks required for General Category i.e. 55% marks in qualifying examination (Clause 1.1 of Prospectus) & qualifying marks in entrance examination should be  $\geq$  50 (Clause 3.7).
- viii. Similarly, valid GATE / NET/ JRF/ /CEED and similar National level tests based on an interview with qualified candidates are also eligible in General Category (AIC/ HOGC) provided that they scored marks in (GATE / NET/ JRF/ CEED and similar National level tests based on an interview qualifying)  $\geq$  the marks required for General Category.
- ix. Reserve Category candidates belonging to SC, DSC, BCA & BCB are not eligible for EWS Category.

- x. Eligibility of the candidates shall be checked at the time of presentation before DRC only. Ineligible candidates qualified in the entrance test shall not be allowed to appear in Seminar/Presentation/Interview to be conducted by respective DRC.

In case of Ph.D. through Part-time Mode, full-time teachers/officials of parent University must also avail leave from the employer for the duration of **Pre Ph.D. COURSE WORK.**

- 3.3. The candidate seeking admission shall apply to the University admission portal online.
- 3.4. The applicants will have to take the Entrance Test and those further shortlisted will be required to appear for interview /viva-voce / presentation. Candidates who have **valid JRF (UGC / CSIR / DBT / any other through an Entrance Test) / GATE / NET/ CEED and similar National level tests based on an interview like teacher fellowship holders/awardee of the fellowship by the DST (INSPIRE), ICMR, ICSSR** are exempted from the Entrance Test. **However, candidates covered under the exempted categories may also appear in the entrance test**, if they so desire, to improve their weightage (Refer Clause 3.11.).
- 3.5. Candidates who are exempted from the Entrance Test in Clause 3.5 may also approach the Departments or Centres round the year to apply for admission to Ph.D. programme except during the period of process of Ph.D. admission **(from the date of initiation of obtaining the Ph.D. Slots to the date of final admission). The respective DRC/CRC will verify the eligibility and conduct the interview with a presentation to the applicant for making a decision.** If selected, the applicants will be admitted to the research programme and will have a Pre-Ph.D. course in the same or subsequent semester(s). **The filled Ph.D. slots are considered as integral part of Ph.D. seat matrix for next Pd.D. admission**
- 3.6. A relaxation of 5 % marks will be allowed in the entrance examination for the candidates belonging to SC/ST/OBC/differently-abled category, Economically Weaker Section (EWS), and other categories of candidates as per the decision of the Commission from time to time in the entrance examination conducted by the University. Minimum qualifying marks do not guarantee admission. Final admission shall be made on the basis of criterion prescribed in Clause 3.11.
- 3.7. The Entrance Test shall be a Single Paper Test having 100 Multiple Choice Questions (MCQs) and duration of test shall be 120 Minutes. The candidates shall be required to answer all questions. There will be no negative marking for wrong answers. The Entrance Test shall be divided in two parts.

- (a) Part 'A' Research methodology

**Part-A** shall consist of 50 MCQs each carrying one mark. The questions which will be of general nature, intended to assess the teaching / research aptitude of the



candidate. It will primarily be designed to test reasoning ability, comprehension, divergent thinking and general awareness of the candidate (**Sample copy of the paper is available at <https://www.dcrustedp.in/dcrustpqp.php>**).

(b) Part 'B'

This part shall contain 50 subject specific MCQs covering the topics given in the syllabus and are designed to test a candidate's knowledge of the subject in which he/she has applied for Ph.D. admission.

3.8. The successful applicants, i.e. eligible applicants, who qualify the Entrance Test or otherwise exempted under Clause 3.5 shall be judged by the Department Research Committee (DRC) through interview/viva-voce/presentation.

3.9. The interview/viva-voce/presentation shall also consider the following aspects, viz. whether:

- a) the candidate possesses the competence for the proposed research;
- b) the research work can be suitably undertaken at the department/centre;
- c) the proposed area of research can contribute to new/additional knowledge.

3.10. The DRC after due assessment of the candidate's competence for the proposed research area of research and its contribution to knowledge and also taking due note of vacancy available in the research area will prepare a merit list.

While preparing the merit list, weightages shall be given according to the following criteria:-

- i. 30% for the marks in the interview/viva- voce to be conducted by the respective DRCs/ CRCs.
- ii. 70% for the marks in the Entrance Test.

OR

50 marks to those candidates who have qualified valid **JRF (UGC / CSIR / DBT)/ CEET/ ICMR/ ICSSR and similar National level tests based on an interview.**

OR

35 marks to those candidates who have qualified valid **GATE / NET/ DST (INSPIRE) National Fellowship.**

***However, candidates covered under the exempted categories may also appear in the entrance test, if they so desire, to improve their weightage.***

**Note: The merit of the candidates who are availing weightage of valid JRF (UGC / CSIR / DBT /CEET any other through an Entrance Test) / GATE / NET / DST (INSPIRE), ICMR, ICSSR or similar National level tests based on an interview will be considered in the category in which they were issued certificate by UGC / other equivalent agencies or in their own category.**

**The candidates, who qualified the entrance test conducted in July, 2022 may opt the same score for admission in Ph.D. (Jan 2023). However, they have to register afresh & may also appear in entrance examinations to improve their score.**

**Number of vacant slots may be decreased depending on the suitability of applicants.**

3.11. In every case, the Department/Centre will have disciplinary and general control over the

research students.

- 3.12. The DRC will verify the eligibility conditions and other required documents with originals before allowing him/her to give a presentation before DRC. The recommendation of DRC including merit list shall be approved by Dean Academic Affairs. (Chairman, DRC is requested to attach merit list of all candidates present during presentation, Attendance sheet of candidates, Recommended candidates for Ph.D. admission category wise along with proposed internal supervisor only, result of entrance test conducted by university, a set of all relevant documents mentioned in clause 12) On the basis of above recommendations, Academic Branch will issue the admission letters to the candidates within a week and candidate has to deposit his/her fees as per instructions given in admission letter. The date of reporting in the Department/Centre concerned shall also be specified in the admission letter.
- 3.13. The list of admitted candidates will be placed before the forthcoming meeting of the Academic Council to take a note and for ratification of the selections made and admitted candidates.
- 3.14. The University shall maintain a list of Ph.D. supervisors (specifying the name of the supervisor, his or her designation, and the department/school/centre), along with the details of Ph.D. scholars (specifying the name of the registered Ph.D. scholar, the topic of his/her research and the date of admitted under them on the website of the institution and update this list every academic year

#### **4. PRE Ph.D. COURSE WORK**

The admitted candidates will be allowed to register for Pre-Ph.D. Courses after their admission.

##### **4.1.1. 4.1 COURSE WORK AND CREDITS**

All research students shall have to complete the specified course work as per the academic semester schedule. Details are given in Ph.D. ordinance.

#### **5. ONLINE FILLING OF APPLICATION FORM**

The candidate seeking admission shall apply to the University online.(link is available on the university website [www.dcrustm.ac.in](http://www.dcrustm.ac.in) / [www.dcrustadmission.org](http://www.dcrustadmission.org))

- Please keep your scanned photograph, saved in a file in jpeg format, ready to upload on the application form. The file size should be between 20 kB to 40 kB.
- Please keep your scanned signature, saved in a file in jpeg format, ready to upload on the application form. The file size should be between 10 kB to 20 kB.

**Please read the instructions given below to complete and submit the Online Application form:-**

- a. Check eligibility for admission to a programme of your choice by clicking on the 'Programme and Eligibility Details' tab.

- b. Keep details of your qualification from matriculation onwards ready.
- c. All the details required in the Online Application form should be filled in.
- d. Last date for submitting the duly completed application along with the required application fee is 08.06.2023 up to 11.59 P.M. (mid night).
- e. Application fee must be paid online through the “Pay Fee” link which is activated after the application form is completed and the submit button is clicked. Application fee to be paid is:-

General category and all others candidates: (₹) 1000.00 (One Thousand Rupees only)

SC/DSC/BC candidates of Haryana State only: (₹) 250.00 (Two Hundred Fifty Rupees

only)

- f. After submitting the Online Application, the registration number and password will be generated.
- g. Note down the registration number and password for future reference. These will be required for the admission test (if applicable).
- h. Fees once paid shall not be refunded / transferred.

## 6. ENTRANCE TEST & SYLLABI

6.1 Candidates seeking admission to Ph.D. programme shall have to appear in the Entrance Test. The eligible applicants will have to qualify the prescribed Entrance Test meant for registration to Ph.D. programme. For detailed information see Clause 3. ADMISSION PROCESS.

6.2 Entrance Tests for admission to various Ph.D. programmes shall be conducted at University level on the basis of prescribed syllabi of concerned discipline.

6.3 A candidate can apply for admission to one department/discipline only. The entrance test will be held at the University Campus as per the schedule.

6.4 Syllabi for Entrance Test

- In case of Physics, Chemistry and Mathematics the syllabus shall be of CSIR-NET-2022
- In case of English and Management, the syllabus shall be of UGC-NET-2022
- **In case of Centre of Excellence in Energy & Environment Studies the syllabus is given in Annexure-A**
- In case of disciplines (Computer Science & Engg. /Electronics & Communication Engg./ Electrical/Mechanical/Biotechnology/ Biomedical Engineering /Chemical/ Civil/Architecture) on the basis of GATE -2022 syllabi.

6.5 The entrance test shall be a single paper test of 120 minutes duration consisting of 100 multiple choice questions. The candidates shall be required to answer all questions.

6.6 There shall be no negative marking.

6.7 The candidates, who qualified the entrance test conducted in Aug, 2022 may opt the same score for admission in Ph.D. (Jan 2023). **However, they have to register afresh & may also appear in entrance examination to improve their score.**

## 6.8 Important Instructions to the candidates for appearing in Entrance Test

- The Candidate must bring his / her Admit Card for appearing in the test.
- The Candidates will be provided with a computer system in case of online examination and question booklet along with OMR Sheet for offline examination.
- In case of online examination, the Candidates are advised to contact the HELP DESK at University Computer Centre, Saraswati Library Building, DCRUST Murthal, at least 30 minutes before the scheduled start of examination to get their computer system location. (The venue of examination shall be notified on the university website/admit card).
- No candidate will be allowed to take the entrance examination 15 minutes after the scheduled start of examination.
- The Candidates should NOT tamper with the computer system /questions booklet/OMR sheet in any form which may lead to disqualification.
- Wrist Watch / Mobile Phones/Blank Papers/ Clipboards/Log Tables/Pagers and any other Electronic Gadget, are not allowed in the Examination hall. However, scientific calculators are allowed.
- The Possession of Books, loose papers, written notes, and/or adoption of unfair means/impersonation / misconduct during the examination shall automatically lead to cancellation of the candidature.
- In case of online examinations, the Candidates shall be provided with A4 sheet for rough work which is to be handed over to the invigilator before leaving the Examination hall at the end of the test.
- The candidates shall bring any of his identity proof with photograph such as Driving License, Pan Card, Passport, Voter Card, Aadhar Card etc. at the time of entrance test.
- Candidates with valid JRF (UGC/CSIR/DBT/any other through entrance test) may also appear in the Entrance Test, if they so desire, to improve their weightage (Refer Clause 3.11).

## 7. FEE STRUCTURE/FEE CONCESSION/SCHOLARSHIP

The fee structure for Ph.D. programme 2023-24 (Odd Semester) will be as under:

S · N o ·	Type	Indian Students (₹)	Foreign Students (USD)
1	Semester fees and Lab Equipment Maintenance Charges (Non –refundable)	11000/-	1550/-
2.	Admission and development fees (Non- Refundable) One-time payment to be paid at the time of admission	10000/-	1000/-
3.	Security deposit (refundable) (to be paid at the time of admission)	5000/-	500/-
	<b>TOTAL (to be paid at the time of admission)</b>	<b>26000/-</b>	<b>3050/-</b>

### Notes:

- i. The fees include Tuition Fee, Examination Fee, University and Student Fund Charges etc.
- ii. No other concession, of any kind, will be admissible to the DCRUST employees and their dependents.
- iii. The Semester Fees will be payable as per the provisions given in ordinance.
- iv. The cut of date of refund of fee against cancellation of admission for the candidates admitted in pre Ph. D course work will be one month after the commencement of classes for pre Ph.D. Course. ₹1,000/- will be deducted as a processing fee. Thereafter, fee paid by them shall be forfeited except refundable security.
- v. University employees will be charged above fee as per university rules.
- vi. **Hostel Room Rent ( Yearly) for all students**

S. No.	Category of Occupancy	Room Rent	Remarks
1.	Single accommodation	₹ 6100/-	In the beginning of Academic Session
2.	Sharing accommodation	₹ 4050/-	

Students who want to stay in the hostel, they are directed to approach to the respective Chief Warden/Warden to deposit the hostel room rent alongwith the other charges of hostel. Respective Chief Warden is requested to deposit the entire amount collected towards hostel room rent charges to the university fund along with the list of students.

If the curriculum/regulations of the University permit any student to reside only for one semester in any academic year, then hostel room rent will be charged equal to half of the amount as mentioned above.

**Note: Due to COVID-19 pandemic and to ensure social distancing and considering the health, safety and welfare of the students, it would not be possible to allot the hostel till further orders.**

## **8. SCHOLARSHIPS**

### **8.1 University Scholarship/Assistance-Ship**

University Scholarship/Assistance-ship by the University will be offered to the Topper of Pre Ph.D. course work done in the University provided the candidate is not availing any other scholarship. In case two or more candidates have the same highest SGPA in course work then topper shall be decided by existing rule to award Gold-Medal to break the tie.

### **8.2 OTHER SCHOLARSHIPS**

The students can avail the Scholarships granted by other organizations like UGC / TEQIP etc.

## **9. COUNSELING AND ADMISSION**

9.1 The final eligibility of candidates shall be determined at the time of presentation/interview before Departmental Research Committee to be conducted by the respective departments and accordingly the admissions shall be made as per Ph.D. ordinance.

9.2 The admission to Ph.D. programme shall be open to the candidates having qualifying degree examination as per clause 1.1

## 10. SCHEDULE OF EVENTS

### Schedule of events for Ph.D. admission 2023-24 (Odd Semester)

S. No.	Event	Date
1	Start of Online submission of form	08.05.2023
2	Last date for online submission of forms	08.06.2023
3	Availability of admit cards on the website	14.06.2023
4	Entrance test examinations (exact date, time & venue shall be printed on the admit card)	June 19,20,21,2023
5	Declaration of result	23.06.2023
6	DRC meetings*	07.08.2023 to 31.08.2023
7	Start of Pre Ph.D. course work classes	04.09.2023

\*Department wise DRC meeting schedule will be uploaded on the website separately.

- 1. The date & time of entrance examination printed on Admit Card shall be final and admit cards shall be made available on login portal of the candidates.**
- 2. Result of the entrance test shall be displayed on the website of the university / login portal of the candidate.**
- 3. Refer university website regularly for any update due to COVID – 19**

## 11. Seat Matrix

S. No.	Name of Department	Total seat	AIC	SQ	HOGC	SC	DS C	BC A	BC B	PH	EWS
			15% of total seats	85% of total seats	50% of SQ	10% of SQ	10% of SQ	16% of SQ	11% of SQ	3% of SQ	10% of SQ
1	Architecture	8	1	6	3	1	0	1	1	0	1
2	Bio-Technology	3	0	3	1	0	1	1	0	0	0
3	Biomedical Engg.	7	1	5	3	1	0	0	1	0	1
4	CEEES	5	1	3	2	0	1	1	0	0	1
5	Chemical Engg.	13	2	10	5	1	1	2	1	0	1
6	Chemistry	3	1	2	1	1	0	1	0	0	0
7	Civil Engg.	5	1	4	2	0	1	0	1	0	0
8	Computer Science & Engg.	19	3	14	7	1	1	2	2	1	2
9	Electrical Engg.	11	1	9	4	1	1	2	1	0	1
10	Electronics & Communication Engg.	25	3	20	10	2	2	2	2	1	2
11	Humanities	3	0	3	1	0	1	1	0	0	0
12	Management studies	8	1	6	3	1	0	1	1	0	1
13	Mathematics	0	0	0	0	0	0	0	0	0	0
14	Mechanical Engg.	22	3	17	9	1	2	1	2	1	2
15	Physics	6	1	4	2	1	0	1	0	0	1
	<b>Total</b>	<b>138</b>	<b>19</b>	<b>106</b>	<b>53</b>	<b>11</b>	<b>11</b>	<b>16</b>	<b>12</b>	<b>3</b>	<b>13</b>



**12. GENERAL INSTRUCTIONS, CODE OF CONDUCT AND ANTI-RAGGING GUIDELINES AND MEASURES, ABOUT THE UNIVERSITY AND DEPARTMENTAL INFORMATION ETC: REFER UNIVERSITY BROCHURE AVAILABLE ON THE UNIVERSITY WEBSITE.**

Note : Any doubt or dispute about the interpretation of this prospectus or the Regulations shall be referred to the Vice Chancellor whose decision shall be final.

**Note:** Candidates shall bring **ONE SET** of Self attested copies of following documents (as applicable) at the time of counseling/presentation along with print out of online filled application form (as applicable) for admission in Ph.D. Programmes and submit the same in respective department.

- Fee receipt.
- Three Passport size photographs.
- Certificates showing the detailed marks / grades in all subjects in the qualifying examination
- Matriculation/Hr. Secondary Examination Certificate as proof of age.
- Conversion Table/Formula showing equivalence between percentage and CGPA of the qualifying degree.
- Valid JRF score card / GATE Score / NET/ *DST (INSPIRE), ICMR, ICSSR or any other equivalent national level fellowship letter (wherever applicable).*
- Medical Fitness Certificate from a Gazetted Medical Officer.
- Character Certificate (Annexure I).
- For gap period, if any, the candidate will submit an affidavit from the notary / first class magistrate certifying his/her good conduct.
- Haryana Resident Certificate (Annexure II).
- Certificate from the Employer (Annexure-III)
- SC/DSC/BC-A or BC-B (OBC is not valid)/PH/FF/DFF/ESM (Annexure -IV, V, VI, VII, VIII, IX, X).
- Declaration by parents (Annexure XI).
- Sponsorship and Relieving Certificate (Annexure XII, XIII)
- Income certificate from competent authority (Annexure-XVI)
- Economically Weaker Section : Income and assets certificate applicable for the state of Haryana (Annexure-XVII)

**CHARACTER/BONAFIDE CERTIFICATE  
(From the institution last attended)**

Certified that Mr./Km./Smt./ \_\_\_\_\_ son/daughter of  
Shri \_\_\_\_\_ has been a bonafide student of this School/College during  
the period \_\_\_\_\_. He/She appeared in the  
\_\_\_\_\_ Examination of the \_\_\_\_\_ (University/Board) held  
in \_\_\_\_\_ under Roll No. \_\_\_\_\_ and \*passed obtaining  
\_\_\_\_\_ marks out of \_\_\_\_\_ marks or \* failed/\* placed  
under \_\_\_\_\_ compartment in the subject of  
\_\_\_\_\_  
\_\_\_\_\_.

It is to further certified that Mr./Ms. \_\_\_\_\_ bears  
\_\_\_\_\_ (good/bad) moral character and his/her general conduct during his/her stay in  
the institution was found \_\_\_\_\_ (satisfactory/unsatisfactory)

No. : \_\_\_\_\_

Date : \_\_\_\_\_

Signature of Principal  
(with office seal)

\* Strike out whichever is not applicable.

**HARYANA RESIDENT CERTIFICATE  
(for bonafide residents of Haryana only)**

Certified that Mr./Km./Smt./\_\_\_\_\_ son/daughter of  
Shri\_\_\_\_\_ resident of

\_\_\_\_\_  
(Complete Address) since \_\_\_\_\_ and applicant for admission to various  
Engineering/Technical Courses in Haryana, is a bonafide resident of Haryana State in terms of Chief  
Secretary, Haryana letter no. 62/17/95-6 GS1 dated 03.10.1996, letter no. 62/32/2000-6GSI dated  
23.05.2003, letter no. 62/27/2003/6 GS1 dated 29.07.2003, letter no. 22/28/2003-3GS-III dated  
30.01.2004 under clause \_\_\_\_\_.

No. \_\_\_\_\_

Signature of the issuing authority

Date: \_\_\_\_\_

Name \_\_\_\_\_

Place: \_\_\_\_\_

Designation \_\_\_\_\_  
(with office seal)

**Note:** i) The competent authorities to issue Haryana Resident Certificate will be as per State Govt. Letter no. 22/28/2003-3 GS III dated 30.01.2004. ii) The candidates, who have passed their qualifying examinations from the Universities/Board/Institutes located in Haryana are not required to produce Certificate of Haryana Resident. iii) The certificate must have been issued on or after 31.01.2005.

**CERTIFICATE FROM THE EMPLOYER**

Certified that Mr./Km./Smt./ \_\_\_\_\_ son/daughter/wife of  
Shri \_\_\_\_\_ is serving as a Regular  
employee \_\_\_\_\_ of

\_\_\_\_\_  
\_\_\_\_\_. Presently, he/she is posted as  
\_\_\_\_\_ in the Department of  
\_\_\_\_\_ at \_\_\_\_\_ (place of posting).

If he / she is got admission in Ph. D Course at DCRUST, Murthal then he / she shall be relieved from his / her service for the duration as mentioned in Ph. D Ordinance applicable to him.

No. \_\_\_\_\_

Date: \_\_\_\_\_

Place: \_\_\_\_\_

Signature of the issuing authority

Name \_\_\_\_\_

Designation \_\_\_\_\_  
(with office seal)

**SCHEDULED CASTE CERTIFICATE**

Certified that Mr./Km./Smt./\_\_\_\_\_ son/daughter of  
Shri \_\_\_\_\_ resident of

\_\_\_\_\_  
(Complete Address) belongs to \_\_\_\_\_ Caste which has been notified as Scheduled  
Caste by the Haryana Government. This certificate is being issued to him/her according to the Haryana  
Govt. Circular letter no. 333(1)-97, dated 25.02.1997, No. 22/28/2003-3 GS III dated 30.01.2004 and  
letter dated 21.06.2004.

No. \_\_\_\_\_

Date: \_\_\_\_\_

Place: \_\_\_\_\_

Signature of the issuing authority

Name \_\_\_\_\_

Designation \_\_\_\_\_  
(with office seal)

**BACKWARD CLASS CERTIFICATE  
BLOCK 'A' OR 'B'**

Certified that Mr./Km./Smt./\_\_\_\_\_ son/daughter of  
Shri \_\_\_\_\_ resident of

\_\_\_\_\_  
(Complete Address) belongs to \_\_\_\_\_ Caste, which has been notified as  
Backward Class by the Haryana Government and is placed in Block \_\_\_\_\_

(mention Block A or B). Further, certified that he/she is not covered in Creamy Layer (Reference from  
the Chief Secretary, Haryana letter no. 1170-SWL1-95 dated 07.06.1995 & No. 62/17/95-6 GSI dated  
03.10.1996 and No. 22/36/2000 3GSIII dated 09.08.2000). This certificate is being issued to him/her in  
terms of notification issued by Chief Secretary, Haryana vide memo no. 22/282003-3 GS III dated  
30.01.2001.

No. \_\_\_\_\_

Signature of the issuing authority

Date: \_\_\_\_\_

Name \_\_\_\_\_

Place: \_\_\_\_\_

Designation \_\_\_\_\_  
(with office seal)

**AFFIDAVIT**

(by the parents of the backward class category candidates)

I, \_\_\_\_\_ Father/Mother of \_\_\_\_\_ Resident of  
 \_\_\_\_\_ Tehsil \_\_\_\_\_ District \_\_\_\_\_  
 seeking admission to \_\_\_\_\_ course in Haryana do hereby  
 solemnly affirm & declare that I belong to \_\_\_\_\_ Caste, which is included in the list  
 of Backward Classes Block 'A'/'B' approved by the Haryana Govt. I further declare and affirm that, I  
 and my wife/husband are not covered under the criteria fixed by Haryana Govt. (Refer Chief Secretary,  
 Haryana letter no. 1170-SWL1-95 dated 07.06.1995 & No. 62/17/95-6 GSI dated 03.10.1996 and No.  
 22/36/2000 3GSIII dated 09.08.2000) for excluding socially advanced persons/sections (Creamy Layer)  
 from Backward Classes. I further undertake that in case the information contained in the above para is  
 found false at any stage, the Competent Authority will be entitled to cancel the admission.

Date: \_\_\_\_\_

DEPONENT

Place: \_\_\_\_\_

**VERIFICATION**

Verified that the above statement is true and correct to the best of my knowledge and belief and nothing  
 has been concealed therein.

Date: \_\_\_\_\_

DEPONENT

Place: \_\_\_\_\_

**PHYSICALLY HANDICAPPED CERTIFICATE**

OFFICE OF THE CHIEF MEDICAL OFFICER \_\_\_\_\_

No. \_\_\_\_\_

Dated : \_\_\_\_\_

Certified that Mr./Km./Smt./ \_\_\_\_\_ son/daughter/wife of

Shri \_\_\_\_\_ resident of

\_\_\_\_\_ District \_\_\_\_\_ appeared

before the Medical Board for medical check-up. On his/her Medical Examination, it is found that the nature of handicap/disability is \_\_\_\_\_% and (as applicable), is as under:

1. Blind or Low Vision \_\_\_\_\_
2. Hearing impairment \_\_\_\_\_
3. Locomotor disability/cerebral palsy \_\_\_\_\_

Thus, the candidate is physically handicapped as per standard norms of Haryana.

(Signature of the applicant)

Chief Medical Officer  
(with office seal)

Date: \_\_\_\_\_

Place: \_\_\_\_\_

Note: The handicap disability should not be less than 40% and should not interfere with the requirement of professional career.



**DECLARATION BY THE FATHER / GUARDIAN OF THE CANDIDATE**

I certify that my son / daughter / ward \_\_\_\_\_ has applied the application with my knowledge and consent and that I hold myself responsible for his / her good conduct and its maintenance and payment of fees during the period he / she will be on the University Rolls.

I am fully aware of the Supreme Court directives in regard to ragging and my son / daughter / ward will not indulge in any act of ragging and will strictly adhere to code of conduct prescribed by university.

Place

Date:

Signature of the Father / Guardian

**SPONSORSHIP CERTIFICATE**

(On the letter head of the organization)

Certified that Mr. / Ms. \_\_\_\_\_ Son / Daughter/wife of Mr. \_\_\_\_\_ has been working as \_\_\_\_\_ in the department of \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ in this Organization. His / her name is hereby sponsored for Full Time / Part Time PG Programme at Deenbandhu Chhotu Ram University of Science & Technology, Murthal.

It is further certified that no enquiry is pending against him/her and he/she will be relieved to join the course, if selected.

Place:  
Date

Signature of the sponsoring  
Authority with Stamp

**RELIEVING CERTIFICATE**  
(On the letter head of the organization)

Certified that Mr. / Ms. \_\_\_\_\_ Son / Daughter/wife  
of Mr. \_\_\_\_\_ currently working as  
\_\_\_\_\_ in the pay scale of Rs. \_\_\_\_\_ on  
permanent / temporary basis in our organization/department has been relieved to join PG / Ph. D.  
Programme at Deenbandhu Chhotu Ram University of Science & Technology, Murthal and that no  
vigilance / departmental or any other enquiry is pending against him / her.

Place:  
Date:

Signature of the sponsoring  
Authority with Stamp

Tehsildar/Sub Division Magistrate/District Magistrate/General Assistant to Dy. Commissioner or Sub-  
Divisional Officer (Civil) of the District/Sub Division

Government of Haryana  
***Income Certificate***  
(For educational purpose only)

Certified that Mr. ----- S/o -----  
resident of ----- Tehsil -----  
----- District ----- is having annual family income from all sources Rs.  
----- as verified by Patwari/competent authority, if employed.

No. : -----

Issued by

Date : -----

Place : -----

Tehsildar

Note : The gross annual income of parents shown in the certificate should be of the financial year 2022-23 and the certificate should be issued on or after 01.04.2023.

**Government of Haryana**  
**(Name and address of the authority issuing certificate)**  
**(ECONOMICALLY WEAKER SECTIONS)**  
*Income and assets Certificate*  
**(For educational purpose only)**

Certificate No.

Dated:-

VALID FOR THE YEAR \_\_\_\_\_

This is to certify that Sh./Smt./Kumari ----- Son/daughter/wife of -----  
 -----is permanent resident of -----Village/Street-----Post.  
 Office----- District -----Pin-code----- whose photograph is affixed below and  
 attested below belongs to economically weaker sections since the gross income of his/her family is below Rs. Six  
 Lakhs for the financial year .....

It is further certified that his/her family does own or possess any of the following assets

- FIVE ACRES OF AGRICULTURAL LAND AND ABOVE
- Residential flats of 1000 sq.ft. and above
- Residential plot of 100 sq. yards and above on notified municipalities
- Residential plot of 200 sq. yards and above in areas other than the notified municipalities
- Total immovable assets owned are valued at Rs. One Crore or more

Sh./Smt./Kumari..... belongs to the caste which is not recognized as scheduled caste,  
 backward class (block-a), backward class (block-b)

Signature with seal of office

Name

Designation

Recent passport size attested photograph of the applicant

Note :

1. The gross annual income of parents shown in the certificate should be of the financial year 2022-23 and the certificate should be issued on or after 01.04.2023.
2. THE PROPERTY HELD BY A “family” in different locations or different places/cities would be clubbed while applying the land or property holding test to determine EWS status.
3. The term ‘family’ for this purpose will include the persons who applies for benefits of reservation, his/her parents, spouse as well children and sub links below the age of 18 years
4. The competent authority or EWS income certificate shall be Tehsildar of the area where the applicant normally resides/ same as prescribed for issue of resident/income certificate as specified in instruction No. 22/28/2003-3GS-3 dated 30.1.2004

**State-wise List of fake Universities as on AUGUST. 2022 (Refer UGC Website for updated information) : [https://www.ugc.gov.in/pdfnews/4182388\\_Public-Notice-on-Fake-Universities-english\\_001.pdf](https://www.ugc.gov.in/pdfnews/4182388_Public-Notice-on-Fake-Universities-english_001.pdf) or latest notification issued by UGC**

**Delhi**

1. All India Institute of Public & Physical Health Sciences (AIIPPHS), State Government University, Office Kh. No. 608-609, 1<sup>st</sup> Floor, Sant Kripal Singh Public Trust Building, Near BDO Office, Alipur, Delhi-1 10036.
2. Commercial University Ltd., Daryaganj, Delhi.
3. United Nations University, Delhi.
4. Vocational University, Delhi.
5. ADR-Centric Juridical University, ADR House, 8J, Gopala Tower, 25 Rajendra Place, New Delhi - 110 008.
6. Indian Institute of Science and Engineering, New Delhi.
7. Vishwakarma Open University for Self-Employment, Rozgar Seva sadan, 672, Sanjay Enclave, Opp. GTK Depot, Delhi-110033.
8. AdhyatmikVishwavidyalaya (Spiritual University), 351-352, Phase-I, Block-A, Vijay Vihar, Rithala, Rohini, Delhi-110085

**Karnataka**

9. Badaganvi Sarkar World Open University Education Society, Gokak, Belgaum, Karnataka.

**Kerala**

10. St. John's University, Kishanattam, Kerala.

**Maharashtra**

11. Raja Arabic University, Nagpur, Maharashtra.

**West Bengal**

12. Indian Institute of Alternative Medicine, Kolkatta.
13. Institute of Alternative Medicine and Research, 8-A, Diamond Harbour Road, Bultech inn, 2<sup>nd</sup> Floor, Thakurpurkur, Kolkatta - 700063

## **Uttar Pradesh**

14. Varanaseya Sanskrit Vishwavidyalaya, Varanasi (UP) Jagatpuri, Delhi.
15. Mahila Gram Vidyapith/Vishwavidyalaya, (Women's University) Prayag, Allahabad, Uttar Pradesh.
16. Gandhi Hindi Vidyapith, Prayag, Allahabad, Uttar Pradesh.
17. National University of Electro Complex Homeopathy, Kanpur, Uttar Pradesh.
18. NetajiSubhash Chandra Bose University (Open University), Achaltal, Aligarh, Uttar Pradesh.
19. Uttar Pradesh Vishwavidyalaya, KosiKalan, Mathura, Uttar Pradesh.
20. MaharanaPratapShikshaNiketanVishwavidyalaya, Pratapgarh, Uttar Pradesh.
21. IndraprasthaShikshaParishad, Institutional Area,Khoda, Makanpur,Noida Phase-II, Uttar Pradesh.

## **Odisha**

22. NababharatShikshaParishad, AnupoornaBhawan, Plot No. 242, PaniTanki Road, Shaktinagar, Rourkela-769014.
23. North Orissa University of Agriculture & Technology, Odisha.

## **Puducherry**

24. Sree Bodhi Academy of Higher Education, No. 186, Thilaspeta, Vazhuthavoor Road, Puducherry-605009

## **Andhra Pradesh**

25. Christ New Testament Deemed University , #32-23-2003, 7<sup>th</sup> Lane, Kakumanavarithota, Gunur, Andhra Pradesh – 522002 or # fit No. 301, Grace villa Apts., 7/5, Srinagar, Guntur, Andhra Pradesh - 522002

**\* BhartiyaShikshaParishad, Lucknow, UP - the matter is subjudice before the District Judge – Lucknow**

**This list** is tentative, the latest / updated list (if any) at the time of admission shall be considered to verify the academic qualifications.

**Reference letter No.F.2-19/2007 (AMPC) pt.III dated May, 2017 from UGC**

**Subject: -Unrecognized Status of IIPM. New Delhi**

It is hereby informed to the students and public at large that Indian Institute of Planning and Management (IIPM). 133/4, Qutub Enclave. Phase-II, New Delhi-16 is not a University within the meaning of the section 2(f) of the UGC Act. 1956. It does not have the right of conferring or granting degrees as specified by the University Grants Commission under Section 22(3) of the University Grants Commission Act. It is further clarified that IIPM is neither entitled to award any UG or PG degree, including BBA/BCA/MBA nor it is recognized by UGC. Hon'ble High Court of Delhi in the matter B. Mahesh Sharma Vs. UOI and Ors. has also refrained IIPM from offering any degree programme vide its Order dated 26<sup>th</sup> September. 2014.



## Annexure-A

### SYLLABI FOR ENTRANCE TEST

For the subjects/courses where JRF/NET/GATE examination is not conducted the syllabi is as under:

#### ENERGY AND ENVIRONMENT STUDIES (CEEES)

**Energy and Environment Relationship:** Basics of Clean Energy Sources, Conventional and Non-Conventional Energy Sources, Problems to Environment from These Sources, Quality and Quantity of Their Magnitude, Comparative Study of Different Pollution Problems in Our Country, Future Scenario of Environmental Degradation Due To Conventional Sources.

**Classification of Energy Sources:** Principle fuels for energy conversion: Fossil fuels, Nuclear fuels. Conventional and Renewable Energy, Energy Sources: prospecting, extraction and resource assessment and their peculiar characteristics, Direct use of primary energy sources, Conversion of primary into secondary energy sources such as Electricity, Hydrogen, Nuclear energy etc, Energy Conversion through fission and fusion, Nuclear power generation etc.

**Basics of Thermodynamics:** Basic Units, Dimensions and Conversions For Energy, Concepts of Energy, Heat and Work, Ideal gas law, I<sup>st</sup> and II<sup>nd</sup> law of thermodynamics (Closed and Open

Systems) Thermodynamics power cycles, Reversible heat Engine cycle, I.C. engine cycles, Carnot Cycle, Rankin Cycle, Otto Cycle, Vapor Refrigeration and power Cycle etc.

**Solar Energy:** Nature of Solar Radiation, Global, Beam and Diffuse Radiation, Hourly, Daily and Seasonal variation of solar Radiation, Estimation of Solar Radiation, Measurement of Solar Radiation, Sun as Source of Energy, Availability of Solar Energy, Nature of Solar Energy, Solar Energy and Environment, Various Methods of using solar energy –Photo thermal, Photovoltaic, Photosynthesis, Present and Future Scope of Solar energy. Basics of Semiconductors Physics: Intrinsic and Extrinsic Semiconductor, Direct and indirect transition, inter-relation between absorption coefficients and band gap recombination of carriers.

**Basics of Photovoltaic Technology:** Types of Solar cells, crystalline silicon deposition techniques, description and principle of working of single crystal, polycrystalline and amorphous silicon solar cells and new materials for solar cells applications.

**Hydrogen Energy:** Hydrogen as a renewable energy source, Sources of Hydrogen, Fuel for Vehicles, Hydrogen Production: Direct electrolysis of water, thermal decomposition of water, biological and biochemical methods of hydrogen production. Storage of Hydrogen: Gaseous, Cryogenic and Metal hydride, Structural characterization of hydride materials, safety related issues, Fuel cell – Principle of working, construction and applications.

**Bio-Fuels:** Concept of Bio-energy: Photosynthesis process, Bio-fuels, Biomass resources Bio based chemicals and materials, Thermo-chemical Conversion: Pyrolysis, Combustion, Gasification, and Liquefaction. Bio-Chemical Conversion: Aerobic and Anaerobic conversion, Fermentation etc. Bio-fuels: Importance, Production and applications. Bio-fuels: Types of Bio-fuels, Production processes and technologies, Bio fuel applications, Ethanol as a fuel for I.C. engines, Relevance with Indian Economy. Bio-based Chemicals and Materials: Commercial and Industrial Products, Biomass, Feed stocks, Chemicals, Plastics, Fibers etc.

**Nuclear Energy:** Potential of Nuclear Energy, International Nuclear Energy Policies and Regulations. Nuclear Energy Technologies – Fuel enrichment, Different Types of Nuclear Reactors, Nuclear Waste Disposal, and Nuclear Fusion.

**Environmental Biology and Biodiversity:** Fundamental concepts of ecology, Ecosystems, Influence of environmental factors (including temperature, light, moisture, soil, nutrients) on organisms and their adaptations in response to them. Global and National Biodiversity Evaluating nature, scale and intensity of the threats to biodiversity. Developing measures for conservation of biodiversity and approaches to its sustainable utilization. Strategy for Conservation of Bio-Resources International conventions and treaties for conservation of bio-resources.

**Environmental Chemistry:** Chemistry of Water, Physico-chemical methods for analysis of environmental samples - Estimation of various elements at major, minor trace, ultra trace level concentrations: choice of a technique, principle, merits and demerits of the techniques - neutron

activation analysis, isotope dilution analysis, colorimetry, atomic absorption spectroscopy, ICPAES, gas chromatography, HPLC, ion exchange chromatography and polarography.

**Introduction to Atmospheric and geosciences:** Dynamics and structure of the Earth: Structure and composition of Earth. Geochemical cycle, Earth's material; Rocks and minerals. Earthquakes, Volcanoes and Earth's interior. Earth surfaces processes and landforms: Weathering and soils, Mass wasting. Impact of anthropogenic activities such as urbanization, mining, river-valley projects, excess withdrawal of ground water. Atmosphere as a part of biosphere ecosystem, Elements of

weather and climate, Evolution of atmosphere, Atmosphere and environmental issues, Composition and structure of the atmosphere, Need of atmospheric studies in environmental science. Atmospheric hazard: Thunderstorm, Tropical cyclone hurricanes, Global warming, Ozone depletion and droughts.

**Environmental Pollution and control:** Water Pollution, Water Quality Standards: BIS and WHO for drinking and agricultural water. Determination of various physicochemical parameters of water. Waste water treatment processes: primary, secondary and tertiary.

**Air Pollution:** Classification of air pollutants, sources, atmospheric reactions, formation of secondary pollutants, permissible limits of air pollutants. Effect of meteorological parameters on transport and diffusion of air pollution, effect of air pollutants on climate. Ozone layer depletion and green house effect. Radiation pollution: Radioactivity and its detection: decay types, various detectors used for measurement of radiations, Management of radioactive wastes: liquid, solid and gases. Noise Pollution: Sources, Measurement, permissible limits, Prevention and control of noise pollution.

**GIS and remote sensing:** Basics of GIS: Definition and Objectives of GIS, History of GIS, Concept of space and time, Elements of GIS, Map Projection: Conical, Azimuthal and Cylindrical. LCC Projection, UTM and Polyconic projections, EMR spectrum, Radiation laws, Active and Passive remote sensing: Optical, Thermal, Microwave, Resolution in Remote sensing data.

**Environmental Impact assessment and Environmental Management:** Environmental Impact Assessment: Concept, origin and development of EIA, Historical perspective and definition of EIA and EIS; Need of EIA; Scope, objectives; Negative and positive aspects and uncertainties in EIA, Methodology, Baseline studies, assessment of Impact and management plan, Public Participation, Environmental management system (EMS), Principles and elements, Preparation of Environmental Management Plans (EMS): Environmental management, Overview of ISO 14000 series, Environmental law, rules and regulation.

**Watershed Management:** Concept of Watershed Management: Definition, Principle, Objectives, Benefits and causes of deterioration, Problem identification Environmental Management: scope, importance, Objectives, Environmental Management tools.