GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR
An Autonomous Institute | NAAC 'A' Grade Institute | Affiliated to MDU, Rohtak

Ref. No. **GITAM/AC/006/2026/** 257-281 Dated: 12/11/2026

To

All the members of the
Academic Council,
Ganga Institute of Technology and Management, Jhajjar

Subject: Agenda for the 6th meeting of the Academic Council

Sir/Madam,

It is to inform you that 6th meeting of the Academic Council will be held on Monday, the 23rd Nov, 2026 at 01:30 P.M. in the Board Room of the Institute. A copy of the agenda is enclosed.

You are requested kindly to make it convenient to attend the meeting.

Encl: As above.

Member Secretary
Academic Council

Endst. No. GITAM/AC/006/2026/ 282-283 Dated: 12/11/2026

Copy to

- Dean College Development Council, MDU Rohtak
- Website In-charge to upload on the website

Member Secretary
Academic Council

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

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GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

AGENDA OF THE 6TH MEETING OF THE ACADEMIC COUNCIL TO BE HELD ON 23.11.2026 AT 1.30 P.M. IN THE BOARD ROOM OF THE INSTITUTE

AC 6.1 Confirmation of the minutes of 5th meeting of the Academic Council held on 05.08.2026.

To confirm the minutes of 5th meeting of the Academic Council held on 05.08.2026 **(Annexure AC/6.1, Pages 1-12, already circulated).**

AC 6.2 Follow-up action report on the decisions taken in the 5th meeting of the Academic Council held on 05.08.2026.

To note the follow-up action on the decisions taken in the 5th meeting of the Academic Council held on 05.08.2026 **(Annexure AC/6.2, Pages 13-15, already circulated)**.

AC 6.3 To approve the commencement of the Ph.D. Programme in the disciplines of Mechanical Engineering, Electrical Engineering, Electronics & Communication Engineering, Computer Science & Engineering and Management.

The Institute has received approval from the Maharshi Dayanand University, Rohtak to start the Ph.D. Programme in the disciplines of Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electrical Engineering and Management vide MDU letter no. CB-II/GITM/2026/9028, dated 10/11/2026 **(Annexure AC/6.3, Pages 16-17).**

The matter was considered by the Director, who ordered that the same be placed before the Academic Council for approval**.**

The Academic Council may consider the above for approval.

AC 6.4 To approve the recommendations of the Academic Planning and Execution Committee made vide resolution no. 2.1 of its meeting held on 12.11.2026 regarding the Ph.D. Ordinance for the Academic Session 2026-27 (Annexure AC/6.4, Pages 18-20).

The Maharshi Dayanand University, Rohtak issues the guidelines/ regulations for its Autonomous Institutes/ Colleges for offering Ph.D. Programmes w.e.f. 2026-27 **(Annexure AC/6.5, Pages 21-24).**

The Academic Planning and Execution Committee vide resolution no. 2.1 of its meeting held on 12.11.2026 **(Annexure AC/6.6, Pages 25-68)** recommended the Ph.D. Ordinance for the Academic Session 2026-27 as per the MDU, Rohtak regulations for its Autonomous Institutes/ Colleges for offering Ph.D. Programs w.e.f. 2026-27.

The matter was considered by the Director, who approved the above recommendations and further ordered that the same be placed before the Academic Council for approval**.**

The Academic Council may consider the action taken by the Director on the recommendations of the Academic Planning and Execution Committee as mentioned above for approval.

AC 6.5 To adopt the Scheme of Examinations and Syllabi for the Course Work of the Ph.D. Programme in the disciplines of Mechanical Engineering, Electrical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, and Management as prescribed by the Maharshi Dayanand University, Rohtak in *toto.*

The Academic Planning and Execution Committee vide resolution 2.3 of its meeting held on 12/11/2026 has recommended that the Scheme of Examinations and Syllabi for the Course Work of the Ph.D. Programme in

- Mechanical Engineering **(Annexure AC/6.7, Pages 69-93),**
- Electrical Engineering **(Annexure AC/6.8, Pages 94-110),**
- Electronics and Communication Engineering **(Annexure AC/6.9, Pages 111-133),**
- Computer Science and Engineering **(Annexure AC/6.10, Pages 134-189),** and
- Management **(Annexure AC/6.11, Pages 190-197),**

as prescribed by the Maharshi Dayanand University, Rohtak in *toto*.

The recommendations of the Academic Planning and Execution Committee were approved by the Director, who further ordered that the same be placed before the Academic Council for approval.

The Academic Council may consider the above for approval.

AC 6.6 To approve the Prospectus for Admission to the Ph.D. Programme for the Session 2026-27.

The Academic Planning and Execution Committee vide **resolution 2.4** of its meeting held on 12/11/2026 has drafted the Prospectus for Admission to the Ph.D. Program for the session 2026-27 **(Annexure AC/6.12, Pages 198-233).**

The matter was considered by the Director, who approved the above recommendations and further ordered that the same be placed before the Academic Council for approval.

The Academic Council may consider the action taken by the Director on the recommendations of the Academic Planning and Execution Committee as mentioned above for approval.

AC 6.7 Any other item with the permission of the Chair.

Registrar

Annexure AC/6.1

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

MINUTES OF THE 5TH MEETING OF THE ACADEMIC COUNCIL HELD ON 05.08.2026 AT 11.00 AM IN THE BOARD ROOM OF THE INSTITUTE

Members Present

1.	Prof. Aman Aggarwal	Chairperson Director, GITAM
2.	Prof. Yudhvir Singh	Member (University Nominee)
3.	Prof. Rajeev Kumar	Member (University Nominee)
4.	Prof. Seema Singh	Member (University Nominee)
5.	Prof. Gian Bhushan	Member (Academia) Online
6.	Mr. Rajesh Sharma	Member (Industry Expert) Online
7.	Dr. Geeta Prabha	Member, Academician
8.	Dr. Anurag Jain	Member
9.	Dr. Punam Devi	Member
10.	Dr. Rakesh Kumar Joon	Member
11.	Dr. Nitin Kumar	Member
12.	Dr. Jitender Kumar	Member
13.	Mr. Vivek	Member
14.	Dr. Anil Chhillar	Member
15.	Ms. Sheela Malik	Member
16.	Ms. Suman Singh	Member
17.	Dr. Dipika	Member
18.	Dr. Hari Parshad	Member
19.	Ms. Upasna	Member
20.	Mr. Parvesh	Member
21.	Dr. Hitanshu Saluja	Member
22.	Dr. Vivek Arora	Member Secretary
23.	Mr. Abhishake Jain	Special Invitee
24.	Dr. Praveen Kumari	Special Invitee

At the outset, the Director GITAM, welcomed the members to the 5th Meeting of the Academic Council. Thereafter, with due permission of the Chair, the agenda items were taken up by the Registrar.

AC 5.1 **Confirmation of the Minutes of the 4th Emergent Meeting of the Academic Council held on 25.03.2026.**

To confirm the Minutes of the 4th Emergent Meeting of the Academic Council held on 25.03.2026 **(Annexure AC/5.1 Pages 1-14, already circulated).**

RESOLVED THAT THE MINUTES OF THE 4TH EMERGENT MEETING OF THE ACADEMIC COUNCIL HELD ON 25.03.2026 (ANNEXURE AC/5.1 PAGES 1-14, ALREADY CIRCULATED) BE CONFIRMED.

[ACTION BY INCHARGE (ACAD.)]

AC 5.2 Follow-up Action Report on the decisions taken by the Academic Council in its Meeting held on 25.03.2026.

To note the follow-up action on the decisions taken by the Academic Council in its meeting held on 25.03.2026 **(Annexure AC/5.2 Pages 15-16, already circulated)**.

RESOLVED THAT THE FOLLOW-UP ACTION ON THE DECISIONS TAKEN BY THE ACADEMIC COUNCIL IN ITS MEETING HELD ON 25.03.2026 (ANNEXURE AC/5.2 PAGES 15-16, ALREADY CIRCULATED) BE NOTED.

[ACTION BY INCHARGE (ACAD.)]

AC 5.3 Consideration of the recommendations of the Board of Studies of the Department of Electronics and Communication Engineering made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 30.05.2026 (Annexure AC/5.3 Pages 17-20, already circulated).

The Board of Studies of the Department of Electronics and Communication Engineering vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 30.05.2026 has recommended the following:

(i) Scheme of Studies & Examinations and Syllabi (A-Scheme) of B.Tech (Electronics and Communication Engineering) 3rd Year *w.e.f.* 2026-27 **(Annexure AC/5.4 Pages 21-81, already circulated).**

(ii) Syllabi of Open Elective Courses offered by Department of Electronics and Communication Engineering for B.Tech. 3rd Year (A-Scheme) *w.e.f.* Academic Session 2026–27 **(Annexure AC/5.5 Pages 82-84, already circulated).**

(iii) Scheme of Studies & Examinations and Syllabi of B.Tech (Electronics and Communication Engineering) 2nd Year (B-Scheme as per NEP-2020) *w.e.f.* 2026-27 **(Annexure AC/5.6 Pages 85-146, already circulated).**

(iv) Scheme of Studies & Examinations of the B.Tech (B-Scheme) Minor Degree, Honours (Hons.) and Specialization in VLSI Design and Technology, along with the syllabi of the 2nd Year, *w.e.f.* the Academic Session 2026–27 **(Annexure AC/5.7 Pages 147-155, already circulated)**.

Minor / Hons. Degree	**To be offered as Hons., Only for following Major Disciplines (For any other Major Discipline which is not mentioned, it may be offered as Minor Degree)**
VLSI Design and Technology	Electronics and Communication Engineering

The matter was considered by the Director, who has approved the above recommendations and ordered to place the same before the Academic Council for approval. The same has been notified to the department concerned vide letter No. GITAM/ACAD/DR/2026/018 dated 20.07.2026.

The Academic Council considered the above; and

RESOLVED THAT THE ACTION TAKEN BY DIRECTOR AS MENTIONED ABOVE AT (i)-(iv) BE APPROVED.

[ACTION BY INCHARGE (ACAD.)]

AC 5.4 **Consideration of the recommendations of the Board of Studies of the Department of Computer Science and Engineering made vide Resolution No. 4.3(a-c), 4.4, 4.5 and 4.6 (a-c) of its meeting held on 06.06.2026 (Annexure AC/5.8 Pages 156-160, already circulated)**

The Board of Studies of the Department of Computer Science and Engineering vide Resolution No. 4.3 (a-c), 4.4, 4.5 and 4.6 (a-c) of its meeting held on 06.06.2026 has recommended the following:

(i) Scheme of Studies & Examinations and Syllabi (A-Scheme) for 3rd Year

(a) B.Tech Computer Science and Engineering and B.Tech Computer Science and Engineering for Working Professionals **(Annexure AC/5.9 Pages 161-216, already circulated).**

(b) B.Tech Computer Science and Engineering-Artificial Intelligence and Machine Learning **(Annexure AC/5.10 Pages 217-270, already circulated).**

(c) B.Tech Computer Science and Engineering-Data Science effective from the Academic Session 2026–27 **(Annexure AC/5.11 Pages 271-327, already circulated).**

(ii) Syllabi of Open Elective Courses offered by the Department of Computer Science and Engineering for B.Tech. 3rd Year (A-Scheme) effective from the Academic Session 2026–27 **(Annexure AC/5.12 Pages 328-329, already circulated).**

(iii) Scheme of Studies & Examinations and Syllabi (B-Scheme as per NEP-2020) common for 2nd Year of

- B.Tech Computer Science and Engineering,
- B.Tech Computer Science and Engineering for Working Professionals,
- B.Tech Computer Science and Engineering-Artificial Intelligence and Machine Learning and
- B.Tech Computer Science and Engineering-Data Science effective from the Academic Session 2026–27 **(Annexure AC/5.13 Pages 330-384, already circulated).**

(iv) Scheme of Studies & Examinations and Syllabi (B-Scheme) for

(a) Honours (Hons.)/Specialization/Minor Degree in the Cyber Security **(Annexure AC/5.14 Pages 385-402, already circulated).**
(b) Minor Degree in the Data Science **(Annexure AC/5.15 Pages 403-420, already circulated)** and
(c) Minor Degree in the Artificial Intelligence and Machine Learning effective from Academic Session 2026-27 **(Annexure AC/5.16 Pages 421-438, already circulated).**

The matter was considered by the Director, who has approved the above recommendations and ordered to place the same before the Academic Council for approval. The same has been notified to the department concerned vide letter No. GITAM/ACAD/DR/2026/019 dated 20.07.2026.

The Academic Council considered the above; and

RESOLVED THAT THE ACTION TAKEN BY DIRECTOR AS MENTIONED ABOVE AT (i)-(iv) BE APPROVED.

[ACTION BY INCHARGE (ACAD.)]

AC 5.5 **Consideration of the recommendations of the Board of Studies of the Department of Civil Engineering made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 06.06.2026 (Annexure AC/5.17 Pages 439-442, already circulated).**

The Board of Studies of the Department of Civil Engineering vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 06.06.2026 has recommended the following:

(i) Scheme of Studies & Examinations and Syllabi (A-Scheme) of B.Tech (Civil Engineering) 3rd Year w.e.f. 2026-27 **(Annexure AC/5.18 Pages 443-498, already circulated).**
(ii) Syllabi of Open Elective Courses offered by the Department of Civil Engineering for B.Tech. 3rd Year (A-Scheme) effective from the Academic Session 2026–27 **(Annexure AC/5.19 Pages 499-502, already circulated).**
(iii) Scheme of Studies & Examinations and Syllabi of B.Tech (Civil Engineering) and B.Tech (Civil Engineering for Working Professionals) 2nd Year (B-Scheme as per NEP-2020) *w.e.f.* 2026-27 **(Annexure AC/5.20 Pages 503-549, already circulated).**
(iv) Scheme of Studies & Examinations and Syllabi of Minor/Honours Degree Programme in Green Technology & Sustainability Engineering **(Annexure AC/5.21 Pages 550-566, already circulated).**

The matter was considered by the Director, who has approved the above recommendations and ordered to place the same before the Academic Council for approval. The same has been notified to the department concerned vide letter No. GITAM/ACAD/DR/2026/020 dated 20.07.2026.

The Academic Council considered the above; and

RESOLVED THAT THE ACTION TAKEN BY DIRECTOR AS MENTIONED ABOVE AT (i)-(iv) BE APPROVED.

[ACTION BY INCHARGE (ACAD.)]

AC 5.6 Consideration of the recommendations of the Board of Studies of the Department of Electrical Engineering made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 08.06.2026 (Annexure AC/5.22 Pages 566-569, already circulated).

The Board of Studies of the Department of Electrical Engineering vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 08.06.2026 has recommended the following:

(i) Scheme of Studies & Examinations and Syllabi (A-Scheme) of B.Tech (Electrical Engineering) 3rd Year w.e.f. 2026-27 **(Annexure AC/5.23 Pages 570-624, already circulated).**

(ii) Syllabi of Open Elective Courses offered by the Department of Electrical Engineering for B.Tech. 3rd Year (A-Scheme) effective from the Academic Session 2026–27 **(Annexure AC/5.24 Pages 625-626, already circulated).**

(iii) Scheme of Studies & Examinations and Syllabi of B.Tech (Electrical Engineering) and B.Tech (Electrical Engineering-Working Professionals) 2nd Year (B-Scheme as per NEP-2020) *w.e.f.* 2026-27 **(Annexure AC/5.25 Pages 627-682, already circulated).**

(iv) Scheme of Studies & Examinations and Syllabi of Minor/Honours Degree Programme in Electric Vehicles **(Annexure AC/5.26 Pages 683-697, already circulated).**

The matter was considered by the Director, who has approved the above recommendations and ordered to place the same before the Academic Council for approval. The same has been notified to the department concerned vide letter No. GITAM/ACAD/DR/2026/021 dated 20.07.2026.

The Academic Council considered the above; and

RESOLVED THAT THE ACTION TAKEN BY DIRECTOR AS MENTIONED ABOVE AT (i)-(iv) BE APPROVED.

[ACTION BY INCHARGE (ACAD.)

AC 5.7 Consideration of the recommendations of the Board of Studies of the Department of Fire Technology and Safety made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 11.06.2026 (Annexure AC/5.27 Pages 698-701, already circulated).

The Board of Studies of the Department of Fire Technology and Safety vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 11.06.2026 has recommended the following:

(i) Scheme of Studies & Examinations and Syllabi (A-Scheme) of B.Tech (Fire Technology and Safety) and B.Tech (Fire Technology and Safety-Working Professionals) 3rd Year w.e.f. 2026-27 **(Annexure AC/5.28 Pages 702-769, already circulated).**

(ii) Syllabi of Open Elective Courses offered by the Department of Fire Technology and Safety for B.Tech. 3rd Year (A-Scheme) effective from the Academic Session 2026–27 **(Annexure AC/5.29 Pages 770-773, already circulated).**

(iii) Scheme of Studies & Examinations and Syllabi of B.Tech (Fire Technology and Safety) and B.Tech (Fire Technology and Safety-Working Professionals) 2nd Year (B-Scheme as per NEP-2020) *w.e.f.* 2026-27 **(Annexure AC/5.30 Pages 774-835, already circulated).**

(iv) Proposal to start the Minor/Honours Degree Programme in Sustainable Energy Engineering (SEE) along with the Scheme of Studies & Examinations and Syllabi **(Annexure AC/5.31 Pages 836-878, already circulated)** The eligible students to opt for the same are as given below:

Minor / Hons. Degree	To be offered as Hons., Only for following Major Disciplines (For any other Major Discipline which is not mentioned, it may be offered as Minor Degree)
Sustainable Energy Engineering (SEE)	Applicable to any discipline of Engineering and Technology

The matter was considered by the Director, who has approved the above recommendations and ordered to place the same before the Academic Council for approval. The same has been notified to the department concerned vide letter No. GITAM/ACAD/DR/2026/022 dated 20.07.2026.

The Academic Council considered the above; and

RESOLVED THAT THE ACTION TAKEN BY DIRECTOR AS MENTIONED ABOVE AT (i)-(iv) BE APPROVED.

[ACTION BY INCHARGE (ACAD.)]

AC 5.8 Consideration of the recommendations of the Board of Studies of the Department of Mechanical Engineering made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 16.06.2026 (Annexure AC/5.32 Pages 879-882, already circulated).

The Board of Studies of the Department of Mechanical Engineering vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 16.06.2026 has recommended the following:

(i) Scheme of Studies & Examinations and Syllabi (A-Scheme) of B.Tech Mechanical Engineering 3rd Year w.e.f. 2026-27 **(Annexure AC/5.33 Pages 883-941, already circulated).**

(ii) Scheme of Studies & Examinations and Syllabi (B-Scheme) of B.Tech Mechanical Engineering 2nd Year *w.e.f.* 2026-27 **(Annexure AC/5.34 Pages 942-996, already circulated).**

(iii) Scheme of Studies & Examinations and Syllabi of the Minor/Honours Degree Programme or Specialization in Robotics **(Annexure AC/5.35 Pages 997-1013, already circulated).**

Minor / Hons. Degree	To be offered as Hons., Only for following Major Disciplines (For any other Major Disciplines which is not mentioned, it may be offered as Minor Degree)
Robotics	Mechanical Engineering, Electrical Engineering and Electronics & Communication Engineering

(iv) Syllabi of Open Elective Courses offered by the Department of Mechanical Engineering for B.Tech. 3rd Year (A-Scheme) effective from the Academic Session 2026–27 **(Annexure AC/5.36 Pages 1014-1017, already circulated).**

The matter was considered by the Director, who has approved the above recommendations and ordered to place the same before the Academic Council for approval. The same has been notified to the department concerned vide letter No. GITAM/ACAD/DR/2026/023 dated 20.07.2026.

The Academic Council considered the above; and

RESOLVED THAT THE ACTION TAKEN BY DIRECTOR AS MENTIONED ABOVE AT (i)-(iv) BE APPROVED.

[ACTION BY INCHARGE (ACAD.)]

AC 5.9 Consideration of the recommendations of the Board of Studies of the Department of Computer Science and Applications made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 30.05.2026 (Annexure AC/5.37 Pages 1018-1022, already circulated).

The Board of Studies of the Department of Computer Science and Applications vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 30.05.2026 has recommended the following:

(i) Syllabus of MCA Software Laboratories (Software Lab 1 to Software Lab 8 and Bridge Course Lab), Dissertation –I Evaluation Criteria, Dissertation –II Evaluation Criteria and PT Evaluation Criteria *w.e.f.* 2026-27 **(Annexure AC/5.38 Pages 1023-1058, already circulated).**

(ii) Scheme of Examinations and Syllabi of BCA 3rd Year (A-Scheme) *w.e.f.* 2026-27 **(Annexure AC/5.39 Pages 1059-1116, already circulated).**

(iii) Revised Credit Structure, Scheme of Studies & Examinations and Syllabi of BCA 1st Year *w.e.f.* 2026-27 **(Annexure AC/5.40 Pages 1117-1181, already circulated).**

(iv) Scheme of Examinations and Syllabi of BCA 2nd Year (B-Scheme) *w.e.f.* 2026-27 **(Annexure AC/5.41 Pages 1182-1249, already circulated).**

The matter was considered by the Director, who has approved the above recommendations and ordered to place the same before the Academic Council for approval. The same has been notified to the department concerned vide letter No. GITAM/ACAD/DR/2026/024 dated 20.07.2026.

The Academic Council considered the above; and

RESOLVED THAT THE ACTION TAKEN BY DIRECTOR AS MENTIONED ABOVE AT (i)-(iv) BE APPROVED.

[ACTION BY INCHARGE (ACAD.)]

AC 5.10 Consideration of the recommendations of the Board of Studies of the Department of Management made vide Resolution No. 4.3, 4.4, 4.6 and 4.7 of its meeting held on 05.06.2026 (Annexure AC/5.42 Pages 1250-1253, already circulated).

The Board of Studies of the Department of Management vide Resolution No. 4.3, 4.4, 4.6 and 4.7 of its meeting held on 05.06.2026 has recommended the following:

(i) Scheme of Examinations for the BBA, BBA (Honours) and BBA (Honours with Research) Programmes from the 5th Semester to 8th Semester and Syllabus for the 3rd Year of the BBA (A-Scheme) from the Academic Session 2026-27 **(Annexure AC/5.43 Pages 1254-1286, already circulated).**

(ii) Revised Scheme of Examinations for the BBA, BBA (Honours) and BBA (Honours with Research) Programmes from 1st to 8th Semester and Syllabus for the 1st Year and 2nd Year of the BBA (B-Scheme) from the Academic Session 2026-27 **(Annexure AC/5.44 Pages 1287-1319, already circulated).**

(iii) Proposal to Start the Certificate Course on "Data Analysis using Excel" from Academic Session 2026-27 **(Annexure AC/5.45 Pages 1320-1322, already circulated).**

(iv) Minor Changes in the note in the Syllabus of MBA Programme

Existing Note	Amended Note
At least four cases will be discussed, one from each unit.	At least four cases will be discussed in the classroom. However, the examiner may ask not more than one case-based question in the examination.

The matter was considered by the Director, who has approved the above recommendations and ordered to place the same before the Academic Council for approval. The same has been notified to the department concerned vide letter No. GITAM/ACAD/DR/2026/025 dated 20.07.2026.

The Academic Council considered the above; and

RESOLVED THAT THE ACTION TAKEN BY DIRECTOR AS MENTIONED ABOVE AT (i)-(iv) BE APPROVED.

[ACTION BY INCHARGE (ACAD.)]

AC 5.11 Consideration of the recommendations of the Academic Planning and Execution Committee of the Institute made vide Resolution No. 1, 2 and 3 of its meeting held on 20.05.2026 (Annexure AC/5.46 Pages 1323-25, already circulated).

The Academic Planning and Execution Committee of the Institute vide Resolution No. 1, 2 and 3 of its meeting held on 20.05.2026 has recommended the following:

(i) The proposal to start B.Tech in Civil Engineering (for Working Professionals), B.Tech in Electrical Engineering (for Working Professionals), M.Tech in Structural Design (for Working Professionals), and MCA (for Working Professionals), as supernumerary seats, from the Academic Year 2026-27 as per AICTE guidelines.

The Institute was granted approval for running of following undergraduate and postgraduate Programmes for Working Professionals from AICTE vide letter no. F. No. North-West/1-46223043271/2026/EOA dated 10.04.2026 **(Annexure AC/5.47 Pages 1326-1331, already circulated).**

Programs for Working Professionals			
Level	**Programme**	**Course**	**Approved Intake 2026-27**
UNDER GRADUATE	ENGINEERING AND TECHNOLOGY	CIVIL ENGINEERING	30
UNDER GRADUATE	ENGINEERING AND TECHNOLOGY	ELECTRICAL ENGINEERING	30
POST GRADUATE	ENGINEERING AND TECHNOLOGY	STRUCTURAL DESIGN	15
POST GRADUATE	COMPUTER APPLICATIONS	MCA	30

As per Clause 10.2 (Page No. 15) of UGC regulations for Autonomous college (Gazetted notification) "An autonomous college is free to start a new degree programme(s) at undergraduate and postgraduate levels with the approval of the Academic Council of the Autonomous College and concerned Statutory Council(s), wherever required, provided the nomenclature of the degree is in consonance with UGC Notification on Specification of Degrees, 2014 as amended from time to time. Such courses shall fulfill the minimum standards prescribed by the parent university/UGC/Statutory Council(s) in terms of number of hours, curricular content and standards, and the parent University shall be duly informed of such courses" **(Annexure AC/5.48 Pages 1332, already circulated).**

(ii) Preparation of the modalities and guidelines for running the Programmes for Working Professionals

The Academic Planning and Execution Committee discussed the modalities and AICTE guidelines for running the Programmes for Working Professionals in AICTE approved Institutions vide Circular No. AICTE/P&AP/APII/2023-24/01 dated 24.08.2023 and Circular No. AICTE/RB/Misc./2023-24 dated 21.03.2024 **(Annexure AC/5.49 Pages 1333-1335, already circulated).** The modalities and guidelines for running the Programmes for Working Professionals shall be the same as those approved by the Academic Council in its 3rd meeting held on 03.07.2025, in accordance with AICTE guidelines. However, the eligibility criteria for admission in M.Tech Structural Design and MCA Programmes will be as follows:

(a) **M.Tech Structural Design:** B.E./B.Tech or other equivalent degree in Civil Engineering or in any other relevant discipline with 50% (47.50% Marks for SC/ST candidates of Haryana only) Marks in aggregate.

(b) **MCA:** Passed BCA/B.Sc. (Hons.) Computer Science/B.E. or B.Tech. (CSE/IT)/B.Voc.(Software Development/IT) or an equivalent degree with having at least 50% marks (45% for SC/ST candidates of Haryana only) in aggregate.

OR

Passed B.Sc./B.Com./B.A. with Mathematics at 10+2 level or at Graduation level with having at least 50% marks (45% for SC/ST candidates of Haryana only) in aggregate, along with the students admitted with this eligibility will have to simultaneously undertake additional *bridge course as prescribed by the Institute during the first semester.

Note*: It is compulsory for each student to pass the bridge course (three additional theory papers and one practical as prescribed in the Scheme of Examinations of bridge course) as per Institute norms during the 1st Year of MCA-2 Year Programme. However, these bridge course papers will be taught only in the 1st semester of the Programme.

(iii) Academic Calendar for the Academic Session 2026-27.

The Academic Planning and Execution Committee of the Institute vide Resolution No. 3 of its meeting held on 20.05.2026 approved the Academic Calendar for the Academic Year 2026-27 **(Annexure AC/5.50 Page 1336, already circulated).**

The committee recommended the items mentioned at (i)-(iii) to the Academic Council for approval.

The matter was considered by the Director, who has approved the above recommendations mentioned at (i)-(iii) and ordered to place the same before the Academic Council for approval. The same has been notified to the Academic Planning and Execution Committee vide letter No. GITAM/ACAD/DR/2026/026 dated 20.07.2026.

The Academic Council considered the above; and

RESOLVED THAT THE ACTION TAKEN BY THE DIRECTOR AS ABOVE BE APPROVED.

[ACTION BY INCHARGE (ACAD.)]

AC 5.12 To consider the recommendations of the Board of Studies of all Departments regarding approval of the Panel of Examiners for Theory/Practical Examinations

The Board of Studies of all Departments approved the Panel of Examiners for Theory/Practical Examinations for Academic Session 2026-27 and recommended the same to the Controller of Examinations **(Annexure AC/5.51 Pages 1337-1378, already circulated).** The Controller of Examinations recommended the same to the Director of the Institute.

The matter was considered by the Director, who has approved the Panel of Examiners recommended by the concerned Board of Studies and ordered to place the same before the Academic Council for approval.

The Academic Council considered the above; and

RESOLVED THAT THE ACTION TAKEN BY DIRECTOR AS MENTIONED ABOVE BE APPROVED.

[ACTION BY COE]

AC 5.13 **Consideration of the action taken by Director on the recommendation of the Chairperson, Board of Studies of the Department of Applied Sciences and Humanities regarding approval of subject expert in the Board of Studies in place of Dr. Divyajyoti Singh, Professor, J.C. Bose University of Science and Technology, YMCA (Formerly YMCA UST).**

The Chairperson, Board of Studies of the Department of Applied Sciences and Humanities received an email from Dr. Divyajyoti Singh, Member (Subject Expert Outside the Parent University), regarding looking for an alternative subject expert in the Board of Studies of the Department of Applied Science and Humanities due to her official responsibilities and consequent inability to attend the meetings of Board of Studies **(Annexure AC/5.52 Pages 1379-1380, already circulated).**

The matter was considered by the Director and further ordered to refer the same to the Academic Council for approval.

The Academic Council considered the above; and

RESOLVED THAT THE NOMINATION OF DR. JYOTI SHEORAN, PROFESSOR OF ENGLISH, GOVERNMENT COLLEGE, JIND AS THE MEMBER (SUBJECT EXPERT OUTSIDE THE PARENT UNIVERSITY) IN THE BOARD OF STUDIES OF THE DEPARTMENT OF APPLIED SCIENCES AND HUMANITIES, FOR ONE YEAR, BE APPROVED.

[ACTION BY INCHARGE (ACAD.)]

The meeting concluded with a vote of thanks to the Chair.

Registrar

Approved

Annexure AC/6.2

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

Report of the Follow-up action on the decisions taken by the Academic Council in its 5th meeting held on 05.08.2026.

Reso. No.	Particulars	Follow-up action Taken
AC 5.1	Confirmation of the Minutes of the 4th Emergent Meeting of the Academic Council held on 25.03.2026.	The minutes were confirmed.
AC 5.2	Follow-up Action Report on the decisions taken by the Academic Council in its Meeting held on 25.03.2026.	The council noted the follow-up action report.
AC 5.3	Consideration of the recommendations of the Board of Studies of the Department of Electronics and Communication Engineering made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 30.05.2026 regarding the Scheme of Examinations and Syllabi of various programs/courses.	The decision conveyed to all concerned. The Scheme of Examinations and Syllabi uploaded on the website.
AC 5.4	Consideration of the recommendations of the Board of Studies of the Department of Computer Science and Engineering made vide Resolution No. 4.3(a-c), 4.4, 4.5 and 4.6 (a-c) of its meeting held on 06.06.2026 regarding the Scheme of Examinations and Syllabi of various programs/courses.	The decision conveyed to all concerned. The Scheme of Examinations and Syllabi uploaded on the website.
AC 5.5	Consideration of the recommendations of the Board of Studies of the Department of Civil Engineering made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 06.06.2026 regarding the Scheme of Examinations and Syllabi of various programs/courses.	The decision conveyed to all concerned. The Scheme of Examinations and Syllabi uploaded on the website.

AC 5.6	Consideration of the recommendations of the Board of Studies of the Department of Electrical Engineering made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 08.06.2026 regarding the Scheme of Examinations and Syllabi of various programs/courses.	The decision conveyed to all concerned. The Scheme of Examinations and Syllabi uploaded on the website.
AC 5.7	Consideration of the recommendations of the Board of Studies of the Department of Fire Technology and Safety made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 11.06.2026 regarding the Scheme of Examinations and Syllabi of various programs/courses.	The decision conveyed to all concerned. The Scheme of Examinations and Syllabi uploaded on the website.
AC 5.8	Consideration of the recommendations of the Board of Studies of the Department of Mechanical Engineering made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 16.06.2026 regarding the Scheme of Examinations and Syllabi of various programs/courses.	The decision conveyed to all concerned. The Scheme of Examinations and Syllabi uploaded on the website.
AC 5.9	Consideration of the recommendations of the Board of Studies of the Department of Computer Science and Applications made vide Resolution No. 4.3, 4.4, 4.5 and 4.6 of its meeting held on 30.05.2026 regarding the Scheme of Examinations and Syllabi of various programs/courses.	The decision conveyed to all concerned. The Scheme of Examinations and Syllabi uploaded on the website.
AC 5.10	Consideration of the recommendations of the Board of Studies of the Department of Management made vide Resolution No. 4.3, 4.4, 4.6 and 4.7 of its meeting held on 05.06.2026 regarding the Scheme of Examinations and Syllabi of various programs/courses.	The decision conveyed to all concerned. The Scheme of Examinations and Syllabi uploaded on the website.

AC 5.11	Consideration of the recommendations of the Academic Planning and Execution Committee of the Institute made vide Resolution No. 1, 2 and 3 of its meeting held on 20.05.2026.	Decision conveyed to all concerned.
AC 5.12	To consider the recommendations of the Board of Studies of all Departments regarding approval of the Panel of Examiners for Theory/Practical Examinations.	Decision conveyed to all concerned.
AC 5.13	Consideration of the action taken by Director on the recommendation of the Chairperson, Board of Studies of the Department of Applied Sciences and Humanities regarding approval of subject expert in the Board of Studies in place of Dr. Divyajyoti Singh, Professor, J.C. Bose University of Science and Technology, YMCA (Formerly YMCA UST).	Decision conveyed to all concerned.



Annexure AC/6.3

~~Annexure A1~~

MAHARSHI DAYANAND UNIVERSITY, ROHTAK

(A State University established under Haryana Act No. XXV of 1975)

'A+' Grade University Accredited by NAAC

Registered/E.Mail

No.CB-II/GITM/2026/ 9028

Dated: 10/11/26

To

The Director/Principal,
Ganga Institute of Technology & Management,
Kablana, Distt. Jhajjar.

Sub: Grant of permission to commence the Ph.D. Programme in the disciplines of Mechanical Engineering, Electrical Engineering, Electronics & Communication Engineering, Computer Science & Engineering and Management and recognition of Ph.D. Supervisors at Ganga Institute of Technology & Management, Kablana, Distt. Jhajjar.

Sir,

I have been directed to inform you that on the basis of the report of the Inspection Committee dated 05.10.2026, the Vice-Chancellor has been pleased to accord approval for the commencement of the Ph.D. Programme in the disciplines of Mechanical Engineering, Electrical Engineering, Electronics & Communication Engineering, Computer Science & Engineering and Management at your College, subject to the provisions of the M.D. University Regulations for Autonomous Institutes/Colleges and the UGC (Minimum Standards and Procedures for Award of Ph.D. Degree) Regulations, 2022, as amended from time to time.

Further, the following faculty members are hereby approved as Ph.D. Supervisors in their respective discipline, subject to fulfilment of all applicable University/UGC norms from time to time:

Department of Mechanical Engineering

1. Prof. Aman Aggarwal, Director, GITAM, Kablana
2. Dr. Jitender Kumar, Assistant Professor
3. Dr. Hari Parshad, Assistant Professor
4. Dr. Vishant Kumar, Assistant Professor

Department of Electrical Engineering

1. Dr. Joginder Singh, Assistant Professor

Department of Electronics & Communication Engineering

1. Dr. Rakesh Kumar, Assistant Professor
2. Dr. Nitin Kumar, Assistant Professor
3. Dr. Vivek Kumar, Assistant Professor
4. Dr. Hitanshu Saluja, Assistant Professor

Department of Computer Science & Engineering

1. Dr. Pramod Kumar, Assistant Professor

Department of Management

1. Dr. Punam Devi, Professor
2. Dr. Dipika, Assistant Professor

18/11/2026

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MAHARSHI DAYANAND UNIVERSITY, ROHTAK

(A State University established under Haryana Act No. XXV of 1975)
'A+' Grade University Accredited by NAAC

3. Dr. Payush, Associate Professor
4. Dr. Bhawana Yadav, Assistant Professor

You are further advised to continue strengthening the research ecosystem by augmenting the laboratory infrastructure through the procurement of advanced equipment/technology and by enriching the library with the latest books, reputed national and international peer-reviewed journals, e-journals, online databases, and other digital research resources to ensure the availability of quality academic and research support and to maintain high standards of doctoral research.

It is also made clear that commencement of the Ph.D. Programme, admission of research scholars, allocation of supervisors, constitution of Research Advisory Committees, conduct of coursework and all other academic and administrative activities relating to the Ph.D. Programme shall be governed by the M.D. University Regulations for Autonomous Institutes/Colleges and the UGC (Minimum Standards and Procedures for Award of Ph.D. Degree) Regulations, 2022, as amended from time to time, and by such instructions as may be issued by the University from time to time.

D.A.: Copy of Inspection Report.

10/11/2026

Deputy Registrar (Colleges)
for Dean Colleges Dev. Council

Endst.No. CB-II/GITM/2026/9029-9051 Dated: 10-11-2026

Copy of the above is forwarded to the following for information and further necessary action:

1. The Chairman, University Grants Commission, Bahadur Shah Zafar Marg, New Delhi-110002.
2. The Joint Secretary, Autonomous Colleges Bureau, University Grants Commission, Ferozshah Road, Near Mandi House, New Delhi-110001.
3. Director General Higher Education, Haryana, Shiksha Sadan, Sector-5, Panchkula, Haryana.
4. Dean, Academic Affairs, M.D. University, Rohtak
5. Dean, Faculty of Engineering & Technology, M.D. University, Rohtak
6. Dean, Faculty of Management Science & Commerce, M.D. University, Rohtak
7. Controller of Exams, M.D. University, Rohtak.
8. Director, Computer Centre, M.D. University, Rohtak
9. Finance Officer, M.D. University, Rohtak.
10. D.R./A.R./OSD (Conduct/R-I/R-II/R-III/R-IV/R&S, Secrecy, Academic Branch), M.D. University, Rohtak.
11. The President, Governing Body, Ganga Institute of Technology & Management, Kablana, Distt. Jhajjar.
12. CB-IV, CB-V and CB-VII Set, Colleges Branch, M.D. University, Rohtak.
13. Dealing of ERP Portal, Colleges Branch, M.D. University, Rohtak to update the ERP Portal.

Deputy Registrar (Colleges)
for Dean Colleges Dev. Council

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Annexure AC/6.4

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

An Autonomous Institute | NAAC 'A' Grade Institute | Affiliated to MDU, Rohtak

MINUTES OF THE MEETING

Minutes of meeting of the Academic Planning and Execution Committee of the Institute was held on 12th Nov., 2026.

The Meeting of the Academic Planning and Execution Committee of the Institute was held on 12th Nov., 2026 in the Board Room of the Institute.

The following members were present in the meeting

- Prof. Aman Aggarwal, Director GITAM
- Dr. Punam Devi, Head, Department of Management Studies
- Dr. Rakesh Kumar Joon, Head, Department of Electronics & Communication Engineering
- Dr. Nitin Kumar, Head, Department of Computer science & Engineering
- Dr. Jitender Kumar, Head, Department of Fire Technology & Safety
- Dr. Joginder Singh, Head, Department of Electrical Engineering
- Dr. Anurag Jain, Head, Department of Applied Science & Humanities.
- Mr. Vivek, Head, Department of Mechanical Engineering.
- Dr. Anil Chillar, Head, Department of Computer Science & Applications
- Dr. Vivek Kumar, Registrar (Member Secretary)

At the outset, the Director welcomed all the members present in the meeting. Thereafter, the agenda items were taken up for discussion, and the following proceedings and resolutions were recorded:

Item No. 1 **To consider and recommend the Ph.D. Ordinance for the Academic Session 2026–27.**

The Registrar apprised the Committee that the Institute had received approval for the commencement of Ph.D. programmes in the following disciplines with effect from the Academic Session 2026–27, vide MDU letter CB-II/GITM/2026/9028, dated 10/11/2026 (Annexure A/1, Pages 1–2):

1. Mechanical Engineering
2. Electrical Engineering
3. Electronics & Communication Engineering
4. Computer Science & Engineering
5. Management

The Committee was further apprised of the guidelines prescribed by Maharshi Dayanand University, Rohtak, for Ph.D. programmes in autonomous colleges (Annexure A/2, Pages 3-6). In accordance with the applicable University guidelines,

the draft Ph.D. Ordinance for the Academic Session 2026–27 was prepared by the committee constituted by the Director (Annexure A/3, Pages 7-50).

The members deliberated upon the provisions of the draft Ordinance and examined its contents in the light of the applicable University guidelines.

RESOLVED THAT THE DRAFT PH.D. ORDINANCE FOR THE ACADEMIC SESSION 2026–27, AS PLACED BEFORE THE COMMITTEE (ANNEXURE A/3, PAGES 7-50), BE RECOMMENDED TO THE ACADEMIC COUNCIL FOR CONSIDERATION AND APPROVAL.

Item No. 2 **To consider and recommend the Scheme of Examinations and Syllabi, for the Ph.D. Course Work in various disciplines, as prescribed by Maharshi Dayanand University, Rohtak.**

The Committee considered the Scheme of Examinations and Syllabi, for the Ph.D. Course Work in Mechanical Engineering (Annexure A/4, Pages 51-75), Electrical Engineering (Annexure A/5, Pages 76-92), Electronics & Communication Engineering (Annexure A/6, Pages 93-115), Computer Science & Engineering (Annexure A/7, Pages 116-171) and Management (Annexure A/8, Pages 172-179), as prescribed by Maharshi Dayanand University, Rohtak.

After due deliberations, the Committee was of the view that the Scheme of Studies and Examinations and syllabi prescribed by the University should be adopted in *toto* for the respective Ph.D. programmes.

RESOLVED THAT THE SCHEME OF STUDIES AND EXAMINATIONS AND SYLLABI FOR THE PH.D. COURSE WORK IN MECHANICAL ENGINEERING, COMPUTER SCIENCE AND ENGINEERING, ELECTRONICS AND COMMUNICATION ENGINEERING, ELECTRICAL ENGINEERING AND MANAGEMENT, AS PRESCRIBED BY MAHARSHI DAYANAND UNIVERSITY, ROHTAK BE RECOMMENDED FOR ADOPTION IN *TOTO*.

FURTHER RESOLVED THAT THE ABOVE RECOMMENDATIONS BE PLACED BEFORE THE ACADEMIC COUNCIL FOR CONSIDERATION AND APPROVAL.

Item No. 3 **To consider and recommend the Prospectus for admission to the Ph.D. Programme with effect from the Academic Session 2026–27.**

The Committee considered the draft Prospectus for admission to the Ph.D. Programme of the Institute with effect from the Academic Session 2026–27 (Annexure A/9, Pages 180-215).

The members deliberated upon the contents of the draft Prospectus and found it suitable for placing before the Academic Council for consideration and approval.

RESOLVED THAT THE DRAFT PROSPECTUS FOR ADMISSION TO THE PH.D. PROGRAMME WITH EFFECT FROM THE ACADEMIC SESSION 2026–27 (ANNEXURE A/9, PAGES 180-215) BE RECOMMENDED TO THE ACADEMIC COUNCIL FOR CONSIDERATION AND APPROVAL.

Registrar

Approved
Director

Annexure AC/6.5

~~Annexure A2~~

MAHARSHI DAYANAND UNIVERSITY, ROHTAK

(A State University established under Haryana Act No. 25 of 1975)
NAAC Accredited 'A+' Grade

NOTIFICATION

The Vice-Chancellor in anticipation of approval of Academic Council/Executive Council has approved the following recommendations of the Committee, **to formulate the guidelines, terms and conditions and fee (to be charged) in respect of Autonomous College/Institutes in order to facilitate the effective implementation of UGC regulations in this regard and offering Ph.D. Program from the session 2026-27**:-

1. As per Clause 10.1 of UGC Notification dated 03.04.2023, an autonomous college is free to start certificate or diploma courses without prior approval of the parent University. The autonomous College should inform the parent University about the introduction of such new course. Approval of the concerned statutory bodies of the Autonomous College and Statutory Council(s) should be obtained, wherever is required. Certificates and Diplomas shall be issued under the seal of Autonomous College.
2. As per Clause 10.2 of UGC Notification dated 03.04.2023, an autonomous college is free to start a new degree programme(s) at undergraduate and postgraduate levels with the approval of the Academic Council of the Autonomous College and concerned Statutory Council(s), wherever is required, provided the nomenclature of the degree is in consonance with UGC Notification on Specification of Degrees, 2014 as amended from time to time. Such courses shall fulfil the minimum standards prescribed by the parent University/UGC/ Statutory Council(s) in terms of number of hours, curricular content and standards, and the parent University shall be duly informed of such courses.
3. The Autonomous College has to properly circulate the agenda(s) and minutes of their Academic Council meetings well in advance, take follow-up actions and action taken report has to be submitted to the member concerned and the office of Dean, College Development Council.
4. The matter regarding Ph.D. admissions in Autonomous Colleges has also been discussed in the meeting and it is decided that the autonomous colleges of MDU may be allowed for Ph.D.programs in the light of UGC regulations by considering the procedure adopted by Kurukshetra University Kurukshetra. The Committee proposed the **"MDU Regulations for its Autonomous Institutes/Colleges for offering Ph.D. Programs"** (copy enclosed at Annexure 'A').
5. The autonomous institute should provide the documents related to (1) List of Faculty with designation (Assistant Professor, Associate Professor and Professor) (2) Date of appointment in the Institute (3) Total Teaching Experience with details and (4) Complete list of publications (Scopus, SCI, UGC Care List, Refereed etc.), Patents, Research Projects and any other Academic Achievement of all the faculty members eligible for Ph.D. supervisions as per UGC norms/MDU Regulations for its Autonomous Colleges/ Institutes for offering Ph.D. program.
6. An Inspection Committee may be constituted comprising of Dean Academic Affairs, Dean Colleges Development Council, Dean, Research & Development and Dean of the concerned Faculty to assess the feasibility whether the Institutes fulfils the norms as per MDU Regulations for its Autonomous Institutes/Colleges for offering Ph.D. Programs.
7. **Registration Return Fee:** ₹5000/- per student will be charged for Registration Return Fee upto the last date and after that the late fee/fine prescribed by the R&S Branch/Controller of Examinations shall be applicable.

MAHARSHI DAYANAND UNIVERSITY, ROHTAK

(A State University established under Haryana Act No. 25 of 1975)
NAAC Accredited 'A+' Grade

8. **Continuation Return Fee**:₹2000/- per student will be charged for Continuation Return Fee upto the last date and after that the late fee/fine prescribed by the R&S Branch/Controller of Examinations shall be applicable.
9. **Award of Degree Fee:** ₹2000/- per student will be charged for award of Degree Fee. For other charges related to the degree viz. duplicate degree, transcript, migration etc., the fee as per University Rules from time to time will be charged.
10. No other fee viz. Development Fund, Examination Fee, Dr. R.K. Foundation Fee, University Sports Fee, Youth Welfare Fee, NSS Fee, Youth Red Cross Fund, Holiday Home Fee and Curriculum Fee shall be charged.
11. The fees at Sr. No. 7 and 8 will be increased by 10%on year to year basis or as prescribed by the University from time to time.

The above guidelines will be applicable from the session 2026-27.

DEAN COLLEGES DEVELOPMENT COUNCIL

Endst. No. CB-II/164/2025/2061-2181 **Dated: 09.04.2026**

Copy of the above is forwarded to the following for information and further necessary action:-

1. The Secretary, University Grants Commissions, Bahadurshah Zafar Marg, New Delhi-110002.
2. Member Secretary, AICTE, Nelson Mandela Road, Vasant Kunj, New Delhi-110020.
3. Director, Department of Higher Education, Haryana, Shiksha Sadan, Sector-5, Panchkula-134109.
4. All the Deans/HOD's/Directors/Branch Officers, M.D. University, Rohtak.
5. Director, University Computer Centre, M.D. University, Rohtak with the request to upload the above notification on the University website.
6. Director, IQAC, M.D. University, Rohtak.
7. Dean (R&D), M.D. University, Rohtak
8. Controller of Examinations, M.D. University, Rohtak.
9. The Finance Officer, M.D. University, Rohtak.
10. All the Principal of University Autonomous Colleges/Institutes (affiliated with MDU, Rohtak).
11. Deputy Registrar (R&S), M.D. University, Rohtak.
12. Assistant Registrar (Academic), M.D. University, Rohtak.
13. Secretary to the Vice-Chancellor/PA to the DAA/Registrar/DCDC (For kind information of Vice-Chancellor/DAA/Registrar/DCDC), M.D. University, Rohtak.
14. Dealing Assistants of CB-I & CB-IX Sets.

9/4/26

Assistant Registrar (Colleges)
For DCDC

Annexure-A

MDU Regulations for its Autonomous Institutes/Colleges for offering Ph.D. Programs w.e.f. 2026-27

The following norms shall apply to Autonomous Institutes/Colleges seeking permission to conduct Ph.D. programs having NAAC 'A' Grade or by NBA for at least three program(s) and having 10 years' of existence under the affiliation to Maharshi Dayanand University, Rohtak:

1. Admissions to the Ph.D. program in the autonomous Institutes/Colleges shall be made only in regular mode. No part-time or distance learning mode shall be permitted. The Institute/College will follow the admission procedure as per latest UGC and MDU norms and notices issued from time to time and as per reservation Policy of the Govt. of Haryana. The Institute/College will maintain a roster register of reservation.

2. For subjects in which UGC-JRF/CSIR-JRF/GATE test is not conducted, a common Ph.D. Entrance Test shall be conducted by Maharshi Dayanand University for admission in Ph.D. programs will be considered for admission in Ph.D. program. Exemption from the entrance test shall be granted only to candidates holding a valid UGC-JRF/CSIR-JRF/GATE qualification subject to the relevant provisions of UGC Regulations and the Maharshi Dayanand University norms.

3. The eligibility of Ph.D. Supervisor shall be governed by the Ph.D. Ordinance of Maharshi Dayanand University and aligned with UGC Regulations, 2022. The supervisor/Co-Supervisor must be the regular and approved faculty of the Institution/College and must have completed a minimum of two years of continuous service in the institute prior to the declaration of Ph.D. seats.

4. As per UGC (Minimum Standards and Procedure for Award of Ph.D. Degree) Regulations, 2022:
   a. The number of Ph.D. seats for admission in Ph.D. program available as per latest UGC/MDU norms shall be declared in advance.
   b. The details of seat allocation alongwith the names and designations of the Supervisors shall be formally communicated to the Maharshi Dayanand University before the admission process is initiated.

5. The registration return of the admitted Ph.D. candidate along with registration fee as per MDU norms for Ph.D. programs should be submitted by the Institute/College to the Registration & Scholarship Branch of the University within one month from the date of enrollment in Ph.D. Program.

6. The Autonomous College/Institute may fix fees as per the norms of the State Government/Statutory Council(s) at their own level, as applicable. The detailed fee structure, as approved by the competent authority, must be published at the time of admission notification. The Autonomous Institutes/Colleges shall remit 30% of the total fee collected (all heads as specified in the Handbook of Information for Ph.D. admission) to the University within one month of admission of candidate in Ph.D. program.

6/3/26 6/3/26 Sumeet 6/3/26 .6/3/26 6/3/2026

7. The presence of two Vice-Chancellor's Nominee from the concerned subject shall be mandatory during the following academic activities:
   i. DRC Meeting
   ii. PGBOS/BOS Meeting
   iii. Pre-submission seminar

   The Travel Allowance (TA), Daily Allowance (DA) and Sitting fee to the nominees for the above activities will be paid as per the norms of Maharshi Dayanand University, Rohtak by the concerned Autonomous College/Institution(s).

8. The implementation of Regulations of Ph.D. Program will be reviewed by the Maharshi Dayanand University, Rohtak from time to time. In case of non-compliance or any other issue regarding Ph.D. program, the University reserves the right to suspend or withdraw the Ph.D. program in the concerned Autonomous College/Institute.

9. The University reserve the right to revise the Regulations for Ph.D. program at Autonomous College/Institute as per the provision of UGC from time to time. The compliance of these regulations with all regulatory requirements is mandatory for continued approval to conduct Ph.D. programs in an Autonomous Institutes/College.

10. The evaluation of Ph.D. thesis will be done by the Controller of Examinations, MDU, Rohtak. The fees pertaining to thesis submission, evaluation and viva-voce will be paid by the Autonomous College/Institute(s) as per MDU, Rohtak norms for Ph.D. programs.

11. The legal implications/litigations regarding Ph.D. admissions, registrations and award of Ph.D. degree, if any, will be solely resolved by the Autonomous College/Institute(s).

12. The appointment of teaching staff and Principal in the Autonomous Colleges/Institutes shall be made as per the Clause 3.9 of UGC Guidelines dated 03.04.2023 and proceedings of the same should be submitted to the office of Dean, Colleges Development Council for information within a week from the conduct of the Selection.

13. The Autonomous Colleges/Institutions are required to submit teachers return annually before the commencement of new academic session to the office of Dean, Colleges Development Council.

14. In case of any other clarification/ambiguity, the regulations by UGC for Autonomous Colleges (Gazette Notification dated 03.04.2023) will be considered & binding to the Autonomous College/Institute(s).

08/3/2026

6/3/26 6/3/26 6/3/26 06/03/26

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

ORDINANCE FOR DEGREE OF DOCTOR OF PHILOSOPHY (Ph.D.)

IN ACCORDANCE WITH THE MDU REGULATIONS FOR ITS AUTONOMOUS INSTITUTES/COLLEGES FOR OFFERING Ph.D. PROGRAMS

***w.e.f.* 2026-27 Session**

1. SHORT TITLE, APPLICATION, COMMENCEMENT

1.1 These Regulations shall be called Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations, 2026 of the Ganga Institute of Technology and Management, Jhajjar in accordance with MDU Regulations for its Autonomous Institutes/Colleges for offering Ph.D. Programs w.e.f. 2026-27 and University Grants Commission (Minimum Standards and Procedure for Award of Ph.D. Degree) Regulations, 2022 and the amendments in the UGC Regulations made from time to time.

1.2 Ganga Institute of Technology and Management (GITAM), Jhajjar, Haryana, was established in 2008. The Institute is affiliated with Maharshi Dayanand University (MDU), Rohtak, and approved by the All India Council for Technical Education (AICTE), New Delhi. The Institute has achieved significant milestones in academic excellence and institutional development. It is accredited with an 'A' Grade by the National Assessment and Accreditation Council (NAAC), and its B.Tech. programmes in Mechanical Engineering, Electronics and Communication Engineering, along with its MBA programme, are accredited by the National Board of Accreditation (NBA). **A major milestone in the Institute's journey was the grant of Autonomous Status by the University Grants Commission (UGC) in July 2024, subsequently notified by MDU, Rohtak, in September 2024 for a period of ten years.** This recognition reflects the Institute's commitment to academic excellence and provides greater academic flexibility in curriculum development, teaching-learning practices, assessment, and evaluation, while maintaining the prescribed regulatory and quality standards. GITAM offers a diverse range of undergraduate and postgraduate programmes designed to meet the evolving needs of industry, technology, research, and society. The Institute offers undergraduate programmes in B.Tech. in Civil Engineering, Computer Science and Engineering, Computer Science and Engineering (Artificial Intelligence and Machine Learning), Computer Science and Engineering (Data Science), Fire Technology and Safety, Mechanical Engineering, Electronics and Communication Engineering, and Electrical Engineering, along with Bachelor of Business Administration (BBA) and Bachelor of Computer Applications (BCA). Its postgraduate programmes include M.Tech. in Structural Design, Computer Science and Engineering, Electronics and Communication Engineering, Electrical Power Systems, Cyber Forensics and Information Security, Machine Design, and Manufacturing and Automation, along with Master of Business Administration (MBA) and Master of Computer Applications (MCA). With a focus on outcome-based education, practical learning, industry interaction, professional development, and ethical values, GITAM strives to prepare graduates for successful careers and lifelong learning. Its emphasis on academic quality, technological advancement, and continuous improvement fosters an environment conducive to innovation, critical thinking, and professional competence.

1.3 The degree of Doctor of Philosophy (Ph.D.) will be awarded in Mechanical Engineering, Electrical Engineering, Electronics and Communication Engineering, Computer Science and Engineering and Management as approved by the M. D. University, Rohtak.

2. ELIGIBILITY CRITERIA FOR ADMISSION TO THE Ph.D. PROGRAM

The following are eligible to seek admission to the Ph.D. program

2.1 Candidates who have completed:

A 1-year/2-semester master's degree program in the concerned/allied subject after a 4-year/8-semester bachelor's degree program or a 2-year/4-semester master's degree program in the concerned/allied subject after a 3-year bachelor's degree program **or** qualifications declared equivalent to the master's degree by the corresponding statutory regulatory body, with at least 55% marks in aggregate or its equivalent grade in a point scale wherever grading system is followed **or** equivalent qualification 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 the educational institution.

Provided that a candidate seeking admission after a 4-year/8-semester bachelor's degree program should have a minimum of 75% marks in aggregate or its equivalent grade on a point scale wherever the grading system is followed.

2.1.1 A relaxation of 5% i.e. from 55% to 50% or its equivalent grade may be allowed for those belonging to SC/BC (non-creamy layer)/Differently-Abled and Economically Weaker Section (EWS) candidates of the Haryana State only.

2.2 Candidates who have completed the M.Phil. program with at least 55% marks in aggregate or its equivalent grade in a point scale wherever grading system is followed or equivalent qualification 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, shall be eligible for admission to the Ph.D. program.

2.2.1 A relaxation of 5% i.e. from 55% to 50% or its equivalent grade may be allowed for those belonging to SC/BC (non-creamy layer)/Differently-Abled and Economically Weaker Section (EWS) candidates of the Haryana State only.

3. PROCEDURE FOR ADMISSION

3.1 The candidate shall apply in a prescribed application format (**Annexure A**) for admission to Ph.D. program.

3.2 Separate application form(s) shall be filled up for each subject/program.

3.3 The Institute shall notify the number of seats to be offered by each Department for admission to Ph.D. program on bi-annual basis in two cycles as per schedule notified by the Institute from time to time. A copy of the same will be submitted to the MDU, Rohtak.

3.4 Admission to Ph.D. program shall be made in the following manner:

3.4.1 Admission of the students who qualify for fellowship/scholarship in UGC-NET/UGC-CSIR NET/JRF/GATE/CEED and similar National Level tests based on an interview.

3.4.2 Through Common Ph.D. Entrance Test conducted by MDU, Rohtak and based on interview in subjects where NET examination is not conducted by the UGC.

A. Admission of NET qualified candidates

a. The Ph.D. seats will be first offered to the candidates in the following order of preference.
   (i) Category-1 NET qualified candidates (Eligible for Award of JRF, Assistant Professor and Ph.D. admissions) based on their performance in the interview.
   (ii) Category-2 NET qualified candidates (Eligible for Assistant Professor and Ph.D. admissions).
   (iii) Category-3 NET qualified candidates (Eligible for Ph.D. admissions based on the maximum of the minimum cut offs prescribed by the UGC).

Note:

1. **The admission of the NET qualified candidates will be considered in the category (NET Category I/II/III) in which they were issued certificate by UGC.**
2. The Category-1 NET qualified candidates shall be admitted into the Ph.D. Programme based on the interview.
3. In case of category 2 and category 3 candidates, 70% weightage will be given for NET scores and 30% weightage for the interview for admission to Ph.D. programmes. The Ph.D. admission will be based on the combined merit of NET marks and the marks obtained in the interview.
4. For Category 1, the validity will be as mentioned in the UGC-NET Scorecard i.e. the candidates having valid NET Score will only be considered for admission to Ph.D. program.
5. The marks obtained in the NET by the candidates in Category 2 and 3 will be valid for a period of one year for admission to Ph.D.
6. The interview shall be of 30 Marks (15 marks for domain knowledge, 10 marks for research aptitude and 5 marks for research accomplishment).
7. Minimum eligibility will be 50% of marks in interview for Category 1, Category 2 and Category 3 candidates.
8. The admission processes for admitting students to Ph.D. Program will be as follows:
   i) The seats will be offered for admission of Category-1 candidates (JRF only) on the basis of merit prepared as per the interview.
   ii) The remaining vacant seats will be offered to Category 2 and Category 3 candidates in order of merit. The category 1 candidates may also apply for admission against the vacant seats, however, the admission will be based on 70% weightage of NET test score and 30% weightage for interview, and the validity of the UGC NET marks for this round of Counselling will be of one year.

b. INTERVIEW

The candidates will be given admission to Ph.D. program based on their performance in the interview by the interview board. At the time of interview, the candidates will be adjudged based on their domain knowledge, research aptitude and research accomplishment before a duly constituted Committee.

The interview domain in addition to above shall also include the following:

1. Competence for research
2. Feasibility of the research work at the Institute

The constitution of interview board shall be as follows:

(i) Director of the Institute – Convener
(ii) Dean Research and Development MDU Rohtak
(iii) All eligible Ph.D. supervisors of Department (s)

(iv) One faculty member belonging to SC/BC/Woman Category shall be co-opted as a Special Invitee in the Interview Committee, in case if they are not represented in (i) & (iii) above. In case, where there is no faculty member from SC/BC/Woman Category in the department, then one faculty member belonging to SC/BC/Woman Category from other department preferably from the same faculty will be co-opted as a Special Invitee. The Special Invitees in the interview board will act as observers only and will not be authorized to award marks for the interview purpose.

(v) The Director of the Institute may opt a Special Invitee from MDU, Rohtak.

Note:

(a) The Interview Committee shall comprise minimum of three faculty members

(b) In case, a Department does not have requisite faculty member, the same shall be constituted by the Director on the request of the concerned Head of the Department from amongst the teachers of the concerned/relevant Faculty/Faculty from MDU, Rohtak.

B. FOR ADMISSION THROUGH ENTRANCE TEST IN SUBJECTS WHERE NET EXAMINATION IS NOT CONDUCTED BY THE UGC

a. In subjects (Engineering etc.) where NET examination is not conducted by the UGC, an entrance test will be conducted by MDU, Rohtak. The syllabus of the Entrance Test will be decided by the MDU, Rohtak

b. Entrance Test will be of 100 marks of 100 questions and a candidate must secure 50% marks to qualify the same. In case of SC/ST / Differently-abled candidates of Haryana State, a relaxation of 5% of 50 i.e. 2.5% will be allowed.

c. Entrance test syllabus shall consist of 50% of Research Methodology and 50% shall be of subject specific.

d. For the selection of candidates based on the entrance test a weightage of 70 % for the entrance test and 30 % for the performance in the interview/viva- voce shall be given.

e. The remaining vacant seats after the admissions to category 1, category 2 and category 3 will be offered to the candidates who have qualified the entrance test. The admission will be based on 70% weightage of entrance test score and 30% weightage for interview.

Note: If two or more candidates secure identical marks in the merit, the candidate senior in age will be given preference.

4. ADMISSION COMMITTEE: -

The constitution of Admission Committee shall be as follows:

i. Director – Convener

ii. One eligible Ph.D. supervisor from Each Department to be nominated by the Director.

iii. One faculty member belonging to SC/BC/Woman Category shall be co-opted as a Special Invitee in the Admission Committee, in case if they are not represented in (i) & (ii) above. The Special Invitees in the Admission Committee will act as observers only and will not be authorized to award marks for the interview purpose.

Note:

- The Admission Committee shall comprise minimum of three members.

5. ALLOCATION OF RESEARCH SUPERVISOR:

Eligibility criteria to be a Research Supervisor, Co-Supervisor, Number of Ph.D. scholars permissible per supervisor, etc.

5.1 Permanent faculty members and working as Director/Principal/Professor/Associate Professor of the Institute with a Ph.D., and at least five research publications in peer-reviewed or refereed journals and permanent faculty members working as Assistant Professors in the Institute with a Ph.D., and at least three research publications in peer-reviewed or refereed journals may be recognized as a Research Supervisor. Such faculty members should be as recognized as Research Supervisor by MDU, Rohtak, who have completed a minimum of two years of continuous service in the Institute prior to the declaration of Ph.D. seats. Such recognized research supervisors cannot supervise research scholars in other institutions, where they can only act as co-supervisors.

5.2 Co-Supervisors from within the same department or other departments of the same institution or other institutions may be permitted with the approval of the Director of the Institute.

5.3 In case of interdisciplinary/multidisciplinary research work, if required, a Co-Supervisor from outside the Department/Institute may be appointed.

5.4 **An eligible Professor/Associate Professor/Assistant Professor can guide up to eight (8) / six (6) / four (4) Ph.D. scholars, respectively, at any given time.**

5.5 Faculty members with less than three years of service before superannuation shall not be allowed to take new research scholars under their supervision. However, such faculty members can continue to supervise Ph.D. scholars who are already registered until superannuation and as a co-supervisor after superannuation, but not after attaining the age of 70 years.

5.6 **Faculty members of the Institute willing to become co-supervisor for Ph.D. Program outside the university shall have to obtain NOC from the Director and all such seats shall be counted against the prescribed limit for supervising Ph.D. candidates. A disclosure regarding such seats shall be mandatory for each faculty member (supervisor/co-supervisor) at the time of offering vacant seats.**

NOTE:

i) At any point, the total number of Ph.D. scholars under a faculty member, either as a supervisor or a co-supervisor, shall not exceed the number prescribed in **Clause 5.4.**

ii) Regarding the publications, research Papers in Peer reviewed/ UGC Journals upto 13.06.2019 and UGC CARE Listed Journals from 14.06.2019 to 10.02.2025 or as decided by the MDU Rohtak from time to time in line with UGC Guidelines are permissible while deciding the eligibility of the supervisor/co-supervisor.

6. RESIDENCY PERIOD

The minimum residency period for Full-Time research scholars in the Institute shall be two years from the date of registration. The attendance of the full time Ph.D. Scholar has to be certified by the concerned supervisor and his/her absence without sanctioned leave shall be reported to the HOD/Director and RAC by the Supervisor.

7. COURSE WORK

7.1 The credit requirement for Ph.D. course work shall be of 12 credits (1 credit equals to 25 marks) in all comprising 2 courses of 4 credits each and two courses of 2 credits each. It shall be mandatory to offer one course on Research Methodology of four credits and another on Research and Publication Ethics of two credits. The Research Advisory Committee can also

recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program. The HOD will ensure that the teaching learning course hours of the course work should be as per credit hours (minimum 12 credits**).**

7.2 All Ph.D. scholars, irrespective of discipline, shall be required to train in teaching /education /pedagogy /writing related to their chosen Ph.D. subject during their doctoral period. Ph.D. scholars may also be assigned 4-6 hours per week of teaching/research assistantship for conducting tutorial or laboratory work and evaluation etc.

7.3 A Ph.D. scholar must obtain a minimum of 55% marks or its equivalent grade in the UGC 10-point scale in the course work to be eligible to continue in the program and submit his or her thesis.

7.4 For each 04 credit course, the internal assessment will be of 30 marks and term-end examination of 70 marks. The Internal Assessment will comprise two written assignments (10 marks each) and two presentations (5 marks each).

For each 02 credit course, the internal assessment will be of 15 marks which shall comprise one written assignment of 10 marks and one presentation of 05 marks. The term-end examination will be of 35 marks.

The concerned teacher/Head of the Department shall maintain the record for at least six months after the declaration of results.

7.5 Every candidate shall be examined in the courses(s) as per criteria laid down in the scheme of examination approved by the Academic Council from time to time except the candidates who are exempted from the Ph.D. course work.

7.6 The amount of the examination fee for course work to be paid shall be governed by the rules of the Institute as applicable from time to time.

7.7 The candidate will be allowed to appear in course work examination, if he/she meets the following requirements:

(i) Bears a good moral character.

(ii) Has been on the rolls of Department/Institute during the concerned semester.

(iii) Has attendance of minimum 65%

Note:

1. Relaxation in shortage of lectures up to 20% will be allowed by the Head of the Department on the following grounds:
   - Self-illness;
   - Illness/death of parents, brother, sister or any other close family member;
   - Any other reason beyond the control of the student to the satisfaction of the Head of the Department.

2. If a candidate fails to complete Ph.D. Course Work examination due to non-fulfillment of required percentage of attendance as per Ph.D. Ordinance, such candidate will be permitted to attend the classes and pass the Ph.D. Coursework in the next Cycle. However, he/she will have to re-submit the full Ph.D. Course Work fee.
   (i) A candidate who fails to pass or having been eligible fails to appear in the examination will be allowed to clear the reappear paper(s) in consecutive two chances in December/May on such dates notified by the Institute (or as decided by the Institute from time to time). In reappear cases, the student will be exempted to appear in such papers in which he/she has obtained 55 per cent marks. If a candidate fails to pass Ph.D. course

work examination within the time stipulated above, his/her admission to Ph.D. program shall be cancelled.

(ii) The internal assessment awards of a candidate who fails in examination shall be carried forward to the next examination.

(iii) The Controller of Examinations of the Institute (GITAM) shall publish a list of candidates who have passed the Ph.D. course work examination.

8. PROCEDURE FOR REGISTRATION

8.1 The candidates who have passed Ph.D. coursework are eligible to apply for registration to Ph.D. in the prescribed format (**Annexure B**).

8.2 **The Institute Research Committee and its Functions**

The Institute Research Committee (IRC) shall consist of the following:

(i) Director of the Institute will be the Chairman of IRC

(ii) All Professors, Associate Professors and Assistant Professors of the Department provided they are otherwise eligible for appointment as Ph.D. Supervisors.

(iii) External expert from the relevant field may be invited.

The Institute Research Committee (IRC) shall have the following functions:

(i) To allocate Supervisor to a student **within a month** after admission of candidate to Ph.D. Program keeping into the consideration of research area of the student and the supervisor.

(ii) To constitute the Research Advisory Committee (RAC) for each candidate on the recommendation of the Research supervisor within 15 days after the declaration of result of Ph.D. course work.

8.3 **Research Advisory Committee and its Functions**

A Research Advisory Committee (RAC) shall consist of the following:

(i) Concerned Supervisor (Convener).

(ii) Co-Supervisor (if any)

(iii) Any two faculty members eligible to be Ph.D. Supervisor. However, in case of non-availability, a faculty member from related/allied discipline as approved by the Director in consultation with the concerned supervisor may be co-opted.

The Research Advisory Committee shall have the following functions:

(i) To review the research proposal submitted by the candidate in prescribed format (**Annexure C**) and suggest the topic of research

(ii) To appoint a Co-supervisor in terms of **Clause 5**, if need be. It shall be ratified by DRC. Co-Supervisor can also be allowed in domains of interdisciplinary and intra-disciplinary nature from the Institute or from other institutions.

(iii) To guide the research scholar to develop the study design and methodology of research.

(iv) To periodically review the progress of the research work of the research scholar.

(v) Every six months, a Ph.D. scholar shall appear before the Research Advisory Committee to make a presentation and submit a brief report on the progress of his/her work for evaluation and further guidance. The Research Advisory Committee shall submit its recommendations in the prescribed format (**Annexure D**) along with a copy of Ph.D. scholar's progress report to the HOD/ who further send the recommendations to the

Director for further processing. A copy of such recommendations shall also be provided to the Ph.D. scholar.

(vi) In case the progress of the Ph.D. scholar is unsatisfactory, the Research Advisory Committee shall record the reasons for the same and suggest corrective measures. If the Ph.D. scholar fails to implement these corrective measures, the Research Advisory Committee may recommend, with specific reasons, the cancellation of the registration of the Ph.D. scholar from the Ph.D. program.

8.4 Application(s) on the prescribed form (**Annexure B**) for registration to Ph.D. program along with synopsis/research proposal (**Annexure C**) duly approved and signed by the Supervisor received upto 31st October/31st March (or as decided by the Institute from time to time) shall be considered by the Department twice a year. The candidature for the Ph.D. Registration would be valid for one year (within two cycles of Registration) from the date of his/her eligibility for the registration.

8.5 (A) A copy of the synopsis/research proposal of each applicant shall be sent to all the members of the RAC by its Convener, under intimation to the Head of the Department and a copy to the Director, at least seven days before the meeting. The candidates will be invited to defend their synopsis/research proposal before the RAC.

(B) The RAC may:

Recommend the research proposal in its original form to the Departmental Research Committee (DRC) for its consideration.

OR

Recommend the research proposal with amendments to the Departmental Research Committee (DRC) for its consideration.

8.6 (A) Head of the Department/Chairperson DRC shall place the application(s) along with the recommendations of the RAC before the Departmental Research Committee (DRC). The candidate(s) will also be invited to defend their synopsis/research proposal(s) before the DRC which shall consist of the following:

(i) Head of the Department concerned/Chairperson Appointed by the Director of the Institute

(ii) All Professors, Associate Professors and Assistant Professors (eligible to be appointed as Ph.D. Supervisor) from the Department

(iii) Dean Research and Development MDU Rohtak

(iv) Two outside experts nominated by the Vice Chancellor MDU Rohtak

(v) One outside expert may be nominated by the Director of the Institute for a period of two years.

(vi) Supervisor/Co-Supervisor of a candidate if he/she is not a member of DRC (Special Invitee)

(B) 2/5th of the members of DRC shall form the quorum. The proceedings of the meeting of the Departmental Research Committee will be valid if at least one out of two experts from MDU, Rohtak, attend the meeting.

8.7 The Departmental Research Committee may:

Recommend the research proposal recommended by RAC in its original form to the Board of Studies (BOS) for its consideration.

OR

Recommend the research proposal recommended by RAC with amendments to BOS for its consideration.

OR

Reject the proposal and send it back to RAC with reasons to be recorded. In this case, the RAC may recommend the fresh proposal by the candidate for consideration by the DRC.

8.8 The recommendations of the DRC for Ph.D. registration shall be placed before the BOS for its consideration and recommendation. The recommendations of BOS shall be placed before the Academic Council for its consideration and approval.

8.9 After the approval of Ph.D. registration, the candidate shall be duly informed about the same and he/she shall pay the registration fee etc. within a month of the date he/she is directed to deposit fee failing which his/her registration stands cancelled. However, the Director may extend this period in special circumstances with late fees as prescribed by the Institute.

8.10 Normally, the date of registration of the research scholar shall be the date on which the BOS recommends the registration of the candidate unless otherwise approved by the Academic Council.

8.11 The list of Ph.D. registered students will be uploaded on the Institute website by the Registration branch of the Institute within one month after approval of registration by the academic council. The list shall include the name of the registered candidate, topic of his/her research, name of his/her supervisor/co-supervisor, date of enrolment and date of registration. A copy of the same is to be submitted to the R&D cell of the Institute.

Note: The whole process of holding the meetings of the Research Advisory Committee, Departmental Research Committee and the BOS shall normally be completed within 3-4 months from the last date of receipt of application for Ph.D. registration in each cycle. **In case the department is not able to meet the deadline the HOD/Chairperson DRC would seek extension with valid reasons for not completing the registration process within the stipulated time from the Director.**

9. DURATION OF THE PROGRAM

9.1 Ph.D. Program shall be for a minimum duration of three years, including coursework, and a maximum duration of six (6) years from the date of admission to the Ph.D. program.

9.2 The registration to Ph.D. stands cancelled upon expiry of six years from the date of admission to Ph.D. program. However, a maximum of an additional two (2) years can be given through a process of re-registration on receipt of application (**as per the format prescribed in Annexure E)** along with the prescribed fee as decided by the Institute from time to time; provided, however, that the total period for completion of a Ph.D. program should not exceed eight (8) years from the date of admission in the Ph.D. program. The following committee will consider the request of the candidate for granting permission for additional two years:

(i) Director - Convener

(ii) HOD Concerned

(iii) Supervisor of the candidate

(iv) Co-Supervisor of the candidate, if any

The Committee shall give its recommendations for extension of period in submission of his/her Ph.D. thesis for not more than one year with an annual fee along with late fee

prescribed by the Institute from time to time specifying that no extension will be allowed beyond that period. The recommendations of the Committee shall be referred to the Academic Council for its approval. If the candidate still fails to submit the thesis within this permissible time, his/her registration to Ph.D. stands cancelled.

9.3 Provided further that, female Ph.D. scholars and Persons with Disabilities (having more than 40% disability) may be allowed an additional relaxation of two (2) years; however, the total period for completion of a Ph.D. program in such cases should not exceed ten (10) years from the date of admission in the Ph.D. program.

9.4 Female Ph.D. Scholars may be provided Maternity Leave/Child Care Leave for up to 240 days in the entire duration of the Ph.D. program on receipt of application for the same by the candidate in the prescribed proforma (**Annexure F).**

9.5 In exceptional cases, a research scholar may be allowed to de-register from the Ph.D. program after successful completion of minimum duration of two years (after minimum residency period) through a process of de-registration on receipt of application (**as per the format prescribed in Annexure G)** on the recommendation of the RAC and the approval of the BOS and Academic Council. The research scholar shall reregister within a period of two years by submitting the application in the prescribed format (**Annexure E**). The Ph.D. thesis should be submitted within such a period that the period of initial registration, de-registration and re-registration does not exceed the total duration of the Ph.D. program mentioned under **Clause 9.1.**

10. TOPIC MODIFICATION

The tentative broader topic shall be submitted by the candidate at the time of registration to his/her Ph.D. program and the final topic of Ph.D. thesis in line with the broader topic submitted at the time of registration shall be decided by the RAC before his/her Pre-Ph.D. submission seminar.

11. CHANGE OF SUPERVISOR

The change of supervisor may be allowed in the following cases:

(i) The supervisor has expired or has left the services of the Institute or the supervisor proceeds on leave and the research scholar makes a request in writing to change the supervisor.

OR

(ii) By mutual consent of both the supervisor and the Research Scholar.

OR

(iii) In case of extreme hardship where it becomes almost impossible for a candidate/supervisor to continue research work, then the request for change of supervisor be submitted to HOD who shall put the matter before the Departmental Committee as well as the concerned BOS . However, the change in such cases will be allowed after the approval of the Academic Council.

(iv) The candidate be allowed to submit the thesis after 1 year of change in Supervisor. The candidate should apply for the change of supervisor in the prescribed format (**Annexure H**).

12. MEDIUM

The medium of instructions and examination shall be Hindi/English/Sanskrit or as prescribed by the concerned BOS.

13. REQUIREMENTS DURING REGISTRATION PERIOD

13.1 Every research scholar will be required to show continuous progress during the period of his/her registration which will be monitored by the Research Advisory Committee.

13.2 The research scholar shall submit a half yearly progress report on the prescribed Proforma (**Annexure D**) for the period from 1st January to 30th June on or before 31st of July and for the period from 1st July to 31st December on or before 31st of January alongwith required annual fee.

13.3 The Research Supervisor shall place the report before the Research Advisory Committee in its meeting to be held preferably in the month of August/February. The research scholar shall also be invited to make a presentation before RAC regarding the progress of his/her work for evaluation and further guidance. The six monthly progress report, duly signed by the RAC, shall be submitted to the HOD/Chairperson DRC with a copy to the research scholar. The progress reports of the Research Scholar shall be placed before DRC on or before 31st March of each year by the HOD/Chairperson DRC who shall forward the same to the Registration Branch after the approval of DRC.

13.4 In case the progress report/presentation of the research scholar is unsatisfactory, the RAC shall record the reasons for the same and suggest corrective measures and will communicate the same to the student concerned. After giving proper opportunity to the scholar if the student fails to implement suggestive/corrective measures within next six months, the RAC will send the recommendations to the Board of Studies for cancellation of the registration. The recommendations of the BOS regarding the cancellation of Ph.D. registration will be forwarded to Registration branch through the concerned HOD/Chairperson DRC for consideration of the Director. The action of the Director in such cases will be placed before the Academic Council for information.

13.5 Ph.D. student shall publish a minimum two research papers, one of which may be a review paper (at least one should be published and other may be in press/accepted) out of his/her research work. These papers should be in Scopus/Web of Science indexed/SCI or SCIE/ peer-reviewed journals. The research scholar shall preferably be first author and supervisor/co-supervisor/research guide may be the corresponding author in at least two research papers. In addition, a research scholar will make two paper presentations in conferences/seminars before the submission of the thesis. The proof of publications and paper presentation must be appended with the thesis.

13.6 Ph.D. scholars may attend at least one workshop of one-week duration (30 hours) on research methodology/ academic writing/ data or statistical analysis and research related issues within two years from the date of the admission to Ph.D. program. Participation certificate will have to be submitted with the thesis as proof of having attended it.

13.7 Prior to the submission of the thesis, the scholar should request the HOD/Chairperson DRC through his supervisor for pre-submission seminar with the permission for the same granted by RAC in the prescribed proforma (**Annexure I**). The HOD/Chairperson DRC shall arrange well within 30 days of the request of the scholar the pre-submission seminar before the IRC and two nominees of the Vice Chancellor, MDU Rohtak which shall also be open to faculty members and research scholars of the concerned Department /Institute. The feedback and comments obtained from them may be suitably incorporated into the thesis by the research scholar under the guidance of his/her Supervisor.

13.8 No research scholar shall join any other Program of study or appear in any other examination

conducted by any University leading to the award of Degree during the period of his/her Ph.D. Program, otherwise his/her registration for Ph.D. will be cancelled by the Director on the recommendations of the Board of Studies. The action of the Director in such cases will be placed before the Academic Council for information.

Note: It is the responsibility of the HOD/Chairperson DRC:

a) To resolve the grievances/issues related to the Ph.D. scholars in a time-bound manner.

b) To ensure the proper implementation of various provisions of Ph.D. Ordinance in letter and spirit

14. CANCELLATION OF REGISTRATION

The Director, on the recommendations of the Board of Studies, may cancel the registration of a research scholar whose research work has been reported to be unsatisfactory or found in violation of the provisions of Ph.D. ordinance by the Board of Studies. The non-submission of two successive Ph.D. half yearly progress report be also treated as unsatisfactory progress and may lead to cancellation of the registration.

15. APPOINTMENT OF EXAMINERS

15.1 After giving a pre-submission seminar, the research scholar will submit an abstract of the thesis duly certified by the Supervisor that his/her research work is complete and ready for submission. The Board of Studies shall recommend a panel of eight external examiners in the prescribed format (**Annexure J**) who shall not be below the rank of Professor to evaluate the thesis. The chairperson of BOS will certify that no external examiner in the panel is below the rank of Professor. Ph.D. pre-submission seminar can be held during vacations/ summer, winter breaks on all days except gazetted holidays and Sundays. The evaluation of Ph.D. thesis will be done by the Controller of Examinations, MDU, Rohtak. The fees pertaining to thesis submission, evaluation and viva-voce will be paid as per MDU, Rohtak norms for Ph.D. Programs. Wherever possible, one of the external examiners should be chosen from outside state/India. The viva-voce board shall consist of the Research Supervisor and at least one of the two external examiners and may be conducted online after the approval of the Vice Chancellor or as per the guidelines prescribed by the University. The viva-voce shall be open to the members of the Research Advisory Committee / faculty members / research scholars.

15.2 However, the Board of Studies while recommending the panel of examiners may ensure that the proposed examiners are from the area of specialization of the Ph.D. thesis. The Board of Studies may ensure that at least 50% of the examiners in the panel are from places outside the state.

15.3 Efforts should be made to recommend examiners of national and international repute belonging to the leading Institutes/ Universities in the country. It shall be up to the Boards of Studies concerned to recommend the examiners from outside the Country.

15.4 Panel of the examiners recommended by the BOS will be valid for six months. However, the Chairperson DRC/HOD may, for satisfactory reasons, extend the period of the panel by a maximum of another six months.

16. GUIDELINES FOR SUBMISSION OF THESIS

16.1 The candidate shall submit his/her thesis within six months of pre-submission seminar alongwith the duly filled proforma (**Annexure K**). The thesis shall be an original piece of research work characterized either by discovery of new facts or enunciation of a new theory or by fresh interpretation of known facts or theories. In either case, it should evince the candidate's capacity for critical acumen and judgment.

16.2 The research scholar shall submit three printed/typed copies of the thesis in spiral binding, along with two soft copies of thesis in pdf file on separate CDs as well as three copies of summary of the thesis in paperback form for evaluation. A candidate shall also submit six copies of the summary of the thesis. Three copies of thesis in hard binding be submitted within a week after the viva-voce examination after incorporation of corrections or suggestions, if any made by the examiners in the report/viva-voce examination.

16.3 The typing/printing of the thesis should be done on both sides of the paper (instead of single side printing) on A-4 size paper in font size '12' in 'Times New Roman' format.

16.4 The thesis should be typed in 1½ space. But the bibliography/ references should be typed in single space.

16.5 The title page of the Ph.D. thesis would be in Maroon Colour with Golden Printing on it.

16.6 The title/cover page will be as per the Standard Ph.D. thesis template **(Annexure Q)** of the University/Institute.

16.7 The thesis will include declaration and copyright certificate from the candidate countersigned by the Supervisor and Head of the Department/Chairperson DRC in the following format:

DECLARATION

This is to certify that the material embodied in the present work entitled "……" is based on my original research work. It has not been submitted in part or full for any other diploma or degree of any University. My indebtedness to other works has been duly acknowledged at the relevant places.

(**Signature of the Candidate with date)**

Countersigned by

Supervisor with date

Head of the Department/ Chairperson DRC with date

IPR CERTIFICATE

The Intellectual Property Rights of the work presented in this thesis rests with the researchers (Name of Candidate and Supervisor) and Ganga Institute of Technology and Management, Jhajjar. No part of this thesis can be reproduced in any form without the written permission of the copyright holders. The thesis does not contain, without explicit acknowledgement, any work, published or un-published of any other person.

(**Signature of the Candidate with date)**

Countersigned by

Supervisor with date

Head of the Department/ Chairperson DRC with date

Note: The Research scholar along with his/her supervisor may reproduce the material extracted verbatim from the thesis for publication or author's personal use provided that the source and the university's copyright notice are indicated.

17. PLAGIARISM CHECK

The following guidelines must be adhered to for submitting the Plagiarism report (**Annexure L**) at the time of submission of Ph.D. thesis:

17.1 The Ph.D. thesis must undergo a Plagiarism check by Turnitin/ iThenticate or any other software recommended by the UGC from time to time.

17.2 The similarity checks for plagiarism shall exclude the following:

(a) Quotes;

(b) All references, bibliography, table of content, preface and acknowledgements;

(c) All generic terms, laws, standard symbols and standard equations, mathematical formula;

(d) Exclude a common knowledge or coincidental terms, up to fourteen (14) consecutive words;

(e) Small similarity less than 1% (to account for generic terms, name of supervisor, institution, department etc.).

17.3 The admissible level of similarity is 10%.

17.4 Regarding self-Plagiarism or cases where published work of the student is shown as similarity in the check, a certificate (Plagiarism Self Exclusion Certificate) has to be issued by the Supervisor specifying and attaching the articles that have been published by the student from thesis work. Only these articles should be excluded from the check. No other article of the Supervisor or the student should be excluded from the check.

17.5 The University Library will issue the Plagiarism Verification Certificate duly countersigned by the Supervisor that the similarity index is acceptable as per UGC guidelines as applicable from time to time and adopted by the University. This certificate is mandatory for submission of a thesis and has to be included in the thesis.

18. FEE FOR Ph.D. PROGRAM

The fee for Ph.D. Program shall be applicable as prescribed by the Institute from time to time.

19. CHECKLIST OF DOCUMENTS

Checklist of documents to be included in the Ph.D. thesis, namely:

- Declaration and IPR certificate, as specified in **Clause 16.7**
- Research publications, as specified in **Clause 13.5**
- Research paper presentation certificate in an International/National Conference/ Seminar, as specified in **Clause 13.5**
- Workshop Participation Certificate, as specified in **Clause 13.6**
- Plagiarism Verification Certificate, as specified in **Clause 17.5** etc.
- Plagiarism Self Exclusion Certificate, as specified in **Clause 17.4**, if need be.
- Declaration regarding compliance of all provisions of Ph.D. ordinance (**Annexure M) as prescribed by MDU, Rohtak**

20. EVALUATION OF THESIS

20.1 The thesis shall be evaluated by two external examiners appointed by the Vice-Chancellor out of the panel of external examiners already recommended by BOS. At least one external examiner shall be from outside the State or Country. The examiners shall be requested to send their reports within one month.

20.2 The evaluation of Ph.D. thesis will be done by the MDU Rohtak.

20.3 Each examiner shall give detailed report on the thesis in the prescribed proforma (**Annexure N**) and make a clear-cut recommendation whether:

The thesis be accepted.

OR

The research scholar be asked to resubmit the thesis with improvements/revisions.

OR

The thesis be rejected

In case the examiner(s) recommend the revisions/improvements of the thesis then he/she may make suggestions for such improvements/revisions as deemed fit. The research scholar shall

be required to submit the revised thesis within one year of communication to him/her. After revision, the thesis shall be sent to the same examiner(s) for evaluation, unless he/she expresses his/her inability.

20.4 If one external examiner recommends award of Ph.D. degree and the other recommends rejection, then the thesis shall be sent to the third external examiner for taking a final decision. In any case, there should be two positive recommendations from the external examiners for the award of Ph.D. degree.

20.5 The examiners must categorically state whether the thesis is suitable/fit for publication in its original form or in a modified form as spelt out by them.

20.6 The examiners shall send a set of questions along with the report that they would like the research scholar to answer in the viva-voce examination.

20.7 A research scholar whose thesis is rejected shall not be registered again for Ph.D. with the same topic.

21. VIVA-VOCE EXAMINATION AND AWARD OF DEGREE

21.1 The viva-voce examination shall be held by a Board of Examiners consisting of Supervisor and one of the external examiners who evaluated the thesis, to be nominated by the Vice-Chancellor, within a period of one month of the receipt of reports of evaluation of the thesis. In the event of non-availability of Supervisor with cogent reasons, in conducting viva–voce, the concerned Head of the Department/Chairperson shall act as supervisor. Board of examiners shall submit the recommendation of Viva-Voce examination in the prescribed format by MDU, Rohtak (**Annexure O**).

In case, both the external examiners who evaluated the thesis are unable to conduct the viva-voce, the Vice-Chancellor shall appoint another external examiner out of the panel to conduct the viva-voce. The date, time and the subject of the thesis shall be notified by the Head of the Department/Chairperson among the teachers and the research scholars of the concerned Faculty, who may be permitted to be present at the time of the viva-voce, but they shall have no right to put any question to the examinee. In special circumstances with the permission of the Vice-Chancellor, the viva-voce examination can be conducted through online mode, if the scholar and/or the external examiner are unable to attend the viva-voce in physical mode.

21.2 The COE shall place the reports of the examiners on the thesis as well as on the viva-voce along with RDC proforma same as prescribed by MDU, Rohtak (**Annexure P**) within one month of the viva-voce for consideration for award of Ph.D. before Research Degree Committee (RDC) as per the norms of Maharshi Dayanand University (MDU), Rohtak.

21.3 Following the successful completion of the evaluation process and announcements of the award of Ph.D., the University Librarian shall submit a soft copy (pdf file) of Ph.D. thesis to UGC within a period of thirty days for hosting the same on INFLIBNET which shall be accessible to all Institutions/ Universities.

21.4 Along with the Degree, the University shall issue a certificate certifying that the degree has been awarded in accordance with the provisions of the Ph.D. regulations of the UGC.

22. PUBLICATION OF THESIS

The permission for publication of the thesis, if applied for by the concerned research scholar may be given by the Director of the Institute if the examiners have recommended that the thesis is suitable/fit for publication. If there is difference of opinion between the examiners regarding the publication of the thesis, the case shall be referred to the committee consisting of the following for consideration

and recommendations:

(a)	Head of the concerned department	-	Chairperson
(b)	Coordinator (R & D)	-	Member
(c)	Supervisor of the Research Scholar		Member

In case the Head of the Department is the Supervisor, the Director would nominate some other expert on the committee. The recommendations of the committee shall be referred to the Director for consideration and approval.

23. FEE STRUCTURE

The details of fee for various processes under Ph.D. Program shall be as per the detail provided in the prospectus for Ph.D. admission. The fee structure is subject to change from time to time by the university.

24. POWER TO REMOVE DIFFICULTIES:

24.1 If any difficulty arises in giving effect to the provisions of this Ordinance, the Director may, by order, make such provisions not inconsistent with the Act, Statutes, Ordinances or other Regulations, as appears to be necessary or expedient to remove the difficulty, however subject to approval of such order by the Statutory bodies of the Institute.

24.2 The provisions of the Ph.D. Ordinance of Maharshi Dayanand University (MDU), Rohtak, and the applicable UGC Regulations, as amended from time to time, shall be followed.

ANNEXURE A

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

AN AUTONOMOUS INSTITUTE | AFFILIATED TO MAHARSHI DAYANAND UNIVERSITY, ROHTAK

APPLICATION FOR ADMISSION TO Ph.D. PROGRAM

(Full Time)

Recent passport size photograph with signature of the Candidate across the Photo

1	Name of Candidate			
2	Father's Name			
3	Permanent Address			
4	Mobile No.			
5.	Email id			
6.	Date of Birth (as given in Matriculation Certificate)			
7	Nationality			
8	Parivar Pehchan Patra (PPP) ID if available			
9	Category of student			
10	Registration No.(In case of ex-student of MDU)			
11	Name of the Department in which Ph.D. admission is sought			
12	Category under which Ph.D. admission (Tick the appropriate one) is sought	a	UGC-NET Category-1	
		b	UGC-NET Category-2	
		c	UGC-NET Category-3	
		d	Entrance test, if applicable	

13. Details of previous examination passed (Please enclosed copy of Marks card)

Examination passed	Year	Name of University/Board	Marks obtained	Maximum Marks	Percentage
10th					
12th					
Graduation					
Post-Graduation					
UGC-NET (Category-1/2/3)					

14. Details of Research Publications:

Title of paper	Details of authors	Year of Publication, Volume No. and Page No.	Journal impact factor, if any (only Thomson Reuters)	Indexing (Scopus/ Web of Science/ UGC CARE List)

15. Details of Migration Certificate, if applicable:

Name of the Universiy:	
Program Completed:	

DECLARATION BY THE CANDIDATE

a. I declare that I have read the rules, the relevant PhD Ordinance of the Institute and undertake to abide by them.
b. I declare that I am not approaching any other University nor I have simultaneously registered for any other certificate, diploma or degree at any other University nor I am appearing at any examination of this University or any other University.
c. I hereby declare that the entries furnished in the form and enclosures are true to the best of my knowledge and belief. In case any entry in this form is found to be false, I will have no objection if the University/Institute disqualifies me from the program and/or debars me from seeking admission in any program of the Institute/University even at a later stage.
d. I hereby declare that I shall abide by the rules and regulations of the Institute/University issued from time to time.

(Signature of Candidate)

Check List of enclosures:

Details	**Please specify Yes/No, If yes upload the corresponding document**
10th Marks Card	
12th Marks Card	
Graduation Marks Card	
Post-Graduation Marks Card	
Proof of qualifying UGC-NET (Category-1/2/3)	
Proof of publications	
Proof of Reserve Category, if applicable	
Migration Certificate, if applicable	

ANNEXURE B

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

APPLICATION FOR REGISTRATION TO Ph.D. PROGRAM

Passport size photo

1	Name of candidate			
2	Father's Name			
3	Permanent Address			
4	Mobile No.			
5	Email id			
6	Name of the Department			
7	Name of the Faculty			
8	Registration No. (In case of ex-student of MDU)			
9	Proof of completion of Ph.D. course work	Enclose copy of Ph.D. course work marks card		
9	Topic of Proposed Research Work **(Enclose the copy of Synopsis as per Annexure B)**			
10	Category under which Ph.D. admission has been taken (Tick the appropriate one)	a	UGC-NET - Category - 1	
		b	UGC-NET Category -2	
		c	UGC-NET Category -3	
		d	Entrance test	
11	Details of Fee Paid	Rs. ..... vide receipt no. ..... (Enclose original fee receipt/Online receipt if fee paid vide online)		
12	Name of the supervisor along with Designation and Affiliation			
13	Name of the co-supervisor, if any along with Designation and Affiliation			

14. Details of the academic/research qualification/experience of the proposed supervisor/Co-supervisor (details of experience at U.G. and P.G. level to be given separately, Enclose a copy of brief biodata of supervisor and Co-supervisor if any).

	Designation	**Name of institution**	**Experience at PG Level**	
Academic qualification				
Teaching experience PG Level				
Teaching experience UG Level				
Post-Doctoral Research Experience				

DECLARATION BY THE CANDIDATE

- I declare that I have read the rules, the relevant Ph.D. Ordinance of the Institute and undertake to abide by them.
- I declare that I am not approaching any other University nor I have simultaneously registered for any other certificate, diploma or degree at any other University nor I am appearing at any examination of Maharshi Dayanand University/GITAM or any other University.
- I hereby declare that the entries furnished in the form and enclosures are true to the best of my knowledge and belief. In case any entry in this form is found to be false, I will have no objection if the University/Institute disqualifies me from the program and/or debars me from seeking admission in any program of the University/Institute even at a later stage.
- I hereby declare that I shall abide by the rules and regulations of the University/Institute issued from time to time

(Signature of Candidate)

CERTIFICATE OF CONSENT BY SUPERVISOR

I hereby give my consent to act as Supervisor for Mr./Ms……

……
…

Date: **(Signature of the Supervisor)**

CERTIFICATE OF CONSENT BY CO-SUPERVISOR (If Any)

I hereby give my consent to act as Co-Supervisor for Mr./Ms……

……

Date: **(Signature of the Co-Supervisor)**

CERTIFICATE OF ELIGIBILITY OF SUPERVISOR/CO-SUPERVISOR

Certified that

1. Prof./Dr.....(Supervisor)
2. Prof./Dr .....(Co-Supervisor, if any)

fulfills the eligibility conditions required for a Supervisor/Co-Supervisor as laid down under concerned **Clause** of the Ph.D. Ordinance.

Date **(Signature of the HOD/Chairman DRC)**

RECOMMENDATIONS OF THE RESEARCH ADVISORY COMMITTEE

i.	Recommended without any modifications	
ii.	Recommended with conditions, please specify briefly	
iii.	Not Recommended, brief reasons are to be given	

Note: Please enclose the copy of Research Advisory Committee Minutes

(Signature of Convener of RAC)

RECOMMENDATIONS OF THE DEPARTMENTAL RESEARCH COMMITTEE

i.	Recommended without any modifications	
ii.	Recommended with conditions, please specify briefly	
iii.	Not Recommended, brief reasons are to be given	

Note: Please enclose the copy of Departmental Research Committee Minutes

Date: **(Signature of the Chairman DRC)**

RECOMMENDATIONS OF THE BOARD OF STUDIES

i.	Recommended without any modifications	
ii.	Recommended with conditions, please specify briefly	
iii.	Not Recommended, brief reasons are to be given	

Note: Please enclose the copy of Board of Studies Minutes

Date: **(Signature of the Chairperson BOS)**

ANNEXURE C

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

AN AUTONOMOUS INSTITUTE | AFFILIATED TO MAHARSHI DAYANAND UNIVERSITY, ROHTAK

FORMAT FOR SUBMISSION OF RESEARCH PROPOSAL/SYNOPSIS FOR REGISTRATION TO Ph.D. PROGRAM

1. Title Page (one page):

Name of Student	
Name of the Supervisor	
Name of the Co-Supervisor, if any	
Name of the Department where the candidate seeks admission	
Name of the Faculty	
Title of the Research Proposal	

2. Introduction

3. Review of the Similar Work (National and International)
(Critical review of the related work issue wise; not a chronological abstraction. Should organize the literature reviewed in a matrix form for example, with issues as columns and references as rows; or otherwise. Should highlight the updates at every progress review)

4. Identification of Research Gap and Problem
(Should be linked with the Literature Review with emphasis on importance of the proposed work) (Aims, Objectives, Hypothesis, Research Problem etc. of the proposed Research in about 300 words)

5. Methodology of the Research Work

6. References

(Name & Signature of the Candidate)

(Name & Signature of

the Co- Supervisor, if any)

(Name & Signature of the Supervisor)

ANNEXURE D

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR
PROFORMA FOR SUBMISSION OF HALF YEARLY PROGRESS REPORT OF REGISTERED RESEARCH SCHOLARS

FOR THE PERIOD OF
1st Jan to 30th June ..... OR 1st July to 31st December ..... (Strikeout whichever is not applicable)

PART- I

1	Name of Department			
2	Name of Research Scholar			
3	Address of Scholar			
4	Registration No.			
5	Date of Ph.D. Registration			
6	Topic of research as approved by the BOS/Academic Council			
7	Change in initial topic, if any. If yes, new topic and date of change			
8	Nature of Fellowship, if any:			
9	Details of leave availed during the period under report, if any.			
10	Date of annual presentation (s)			
11	Details of Fee Paid (Enclose the copy of receipts)	**Details of Fee**	**Amount (Rs.)**	**Fee receipt dated**
		First Registration		
		1st Year Annual Fee		
		2st Year Annual Fee		
		3rd Year Annual Fee		
		4th Year Annual Fee		
		Extension Fee paid if any		
12	Date of last RAC meeting			
13	Research work done during the period under Report **(Attach the details as Annexure)**			
14	Details of publications during the period of report (Enclose copy of Publication)			
15	Details of presentations during the period of report (Enclose proof of presentation)			

Note: The progress report should be submitted in triplicate. First copy to be retained by the Department, second copy to be forwarded to Registration branch by the department & third copy to be retained by the candidate.

(Signature of candidate)

PART-II
SPECIFIC RECOMMENDATIONS OF RAC

Comments of RAC

Recommendation: Satisfactory or Not Satisfactory If not Satisfactory, specify reasons

Suggestive corrective measures

Signatures of RAC Member(s)

1.
2. **Signature of Supervisor(s)**

Date:.....

PART-III

Specific recommendations of DRC

Date ..... **Signature of Chairman DRC**

(**The minutes of DRC be attached**)

ANNEXURE E

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

APPLICATION FOR RE-REGISTRATION TO Ph.D. PROGRAM

1	Name of Department				PHOTO
2	Name of Research Scholar				
3	Father's Name				
4	Permanent Address				
5	Registration No.				
6	Date of registration				
7	Date of Deregistration				
8	Justification for Reregistration	Automatic cancellation of Ph.D. registration upon expiry of 4 years from the date of admission to Ph.D. program		Specific Reason (Specify)	
9	Details of Fee Paid	Rs. ..... vide receipt no. ..... (Enclose original fee receipt/Online receipt if fee paid vide online)			
10	Nature of extension sought	**Beyond 4 years**	**Beyond 5 years**	**Beyond 6 years**	**Beyond 7 years**
	Enclose a copy of all extension letters beyond 4 years, if applicable	**YES / NO**	**YES / NO**	**YES / NO**	**YES / NO**
11	Date up to which extension is sought				
12	Number of publications in Scopus/Web of Science/ UGC Care listed journals/Peer Review from the Ph.D. research work (Attach Proof)				
Justification of Research Scholar verified by the Supervisor					
13	**Proposed Research Objectives**	**Status of Completion**	**Research Scholar`s Justification for Non completion of the objective**	**Verification remarks by the Supervisor**	
	a) Objectives of the work				
	i) Objective 1				
	ii) Objective 2				
	iii) Objective 3				
	iv) Objective 4				
	Add columns as per requirement to showcase all objectives				

14. Details of Ph.D. Progress:

Details of Ph.D. Progress Report submission	**Scheduled date of progress report submission**	**Actual Date of submission of progress report**	**Recommendation of RAC (Satisfactory/ Unsatisfactory)**	**Justification of Research Scholar for delay in submission of progress report**	**Verification remarks by the Supervisor**
First Progress Report (0-6 months)					
Second Progress Report (7-12 months)					
Third Progress Report (13-18 months)					
Fourth Progress Report (19-24 months)					
Fifth Progress Report (25-30 months)					
Sixth Progress Report (31-36 months)					
Seventh Progress Report (37-42 months)					
Eighth Progress Report (43-48 months)					
Ninth Progress Report (49-54 months) if applicable					
Tenth Progress Report (55-60 months) if applicable					
Eleventh Progress Report (61-66 months) if applicable					
Twelfth Progress Report (67-72 months) if applicable					
Thirteenth Progress Report (73-78 months) if applicable					
Fourteenth Progress Report (79-84 months) if applicable					

		Justification of the Research Scholar	**Verification Remarks by the Supervisor**
15	**Justification of non-completion of work in the first extension period, if applying for second extension**		
16	**Circumstances which hampered the progress**		
17	**Justification of the Research Scholar for grant of extension of period for submission of his/her thesis**		

(Name and Signature of Supervisor) **(Name and Signature of Candidate)**

Remarks of Supervisor		
1	Has the candidate made sincere efforts to complete the work in time?	
2	Will the thesis be completed within the extension period asked for?	

Signature of Supervisor

Remarks/Recommendations of HOD

Signature of HOD/Chairman DRC

ANNEXURE F

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

APPLICATION FOR MATERNITY LEAVE

Name of Department		
Name of the Faculty		
Date of Ph.D. Registration		
Title of Ph.D. research work		
Name of the Supervisor		
Name of the co- supervisor if any		
Correspondence Address:		
Email and Mobile Number		
Period of maternity leave requested (Enclose Supporting Document) (Maximum of 240 days allowed as per rules)	**From**	**To**

DECLARATION

I intend to return to my studies on ……. and undertake to complete and submit my thesis. I understand that the period of maternity leave will be added to the expected submission date of my thesis.

Date: **Signature of candidate**

SUPERVISOR USE ONLY

Recommended / Not Recommended (If not recommended, Please specify the reason there of)	
Supervisor's Name:	
Date	**Signature of Supervisor**

(Signature of HOD/ Chairman DRC)

Signature of Registrar

Approved / Not Approved

(Signature of Director)

ANNEXURE G

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

APPLICATION FOR DE REGISTRATION TO Ph.D. PROGRAM

UNDER CLAUSE 9.5 OF Ph.D. ORDINANCE

Photograph

1	Name of Department	
2	Name of Research Scholar	
3	Name and address of Supervisor and Co supervisor (if any)	
4	Father's Name	
5	Permanent Address	
6	Registration No.	
7	Date of registration	
8	Justification for Deregistration	
9	Details of Fee Paid	Rs. .....vide receipt no..... (Enclose original fee receipt / Online receipt if fee paid vide online)
10	Report on Progress made before Deregistration (enclose As Annexure)	

(Name and Signature of Candidate)

Remarks / Recommendations of RAC (Enclose of copy of RAC minutes)

Signature of Convener of RAC (Supervisor)

Recommendations of BOS (Enclose copy of BOS minutes)

Signature of Chairperson, BOS

ANNEXURE H

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

APPLICATION FOR CHANGE / SUBSTITUTION / ADDITION OF Ph.D. THESIS SUPERVISOR(S)

1	Name of Research Scholar	
2	Name, Designation and Address of Existing Supervisor(s)	
3	Name, Designation and Address of Existing Co-Supervisor(s) if any	
4	Date of registration in Ph.D. program	
5.	Details of Existing Supervisor / Co-Supervisor to be Changed/Substituted	
6	Details of proposed Supervisor / Co-Supervisor to be added	
7	Justification for the change / Substitution / addition of Supervisor / Co-supervisor	
8	Details of Fee Paid	Rs……vide receipt no……..... (Enclose original fee receipt / Online receipt if fee paid vide online)

Signature of Student

(Name and Signature of outgoing Supervisor / Co-supervisor)	**(Name and Signature of incoming supervisor / Co-supervisor)**

Recommendation of RAC (Enclose copy of RAC minutes) Recommended / Not Recommended **Signature of Convenor of RAC**
Recommendation of DRC (Enclose copy of DRC minutes) Recommended / Not Recommended **Signature of Chairman, DRC**
Recommendation of PGBOS / BOS (Enclose copy of PGBOS / BOS minutes) Recommended / Not Recommended **Signature of Chairperson, BOS**

ANNEXURE I

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

PERMISSION OF RESEARCH ADVISORY COMMITTEE TO SUBMIT THE Ph.D. RESEARCH SUMMARY

1	Name of Department	
2	Name of Research Scholar	
3	Registration No.	
4	Date of registration	
5	Topic of the Research	
6	Name of the Supervisor	
7	Name of the Co- Supervisor, if any	

REVIEW &RECOMMENDATIONS

1	Research progress	Satisfactory /Not Satisfactory
2	Status of compliance of research paper publications	Complied /Not Complied (If complied enclose copy of Research Publications)
3	Status of compliance of conference presentations	Complied/ Not Complied (If complied enclose copy of certificates of conference presentations)
4	Status of compliance of one-week mandatory research methodology Workshop	Complied/ Not Complied (If complied enclose copy of certificate)
3	Permission granted for submission of research summary and preparation of thesis	Yes/No
4	Permission granted for submission Of research summary with conditions (please specify the conditions)	
5	Other remarks, if required	

(Signature of Convener of RAC) **(RAC Member 1)**

(RAC Member 2) **(RAC Member 3, if any)**

ANNEXURE J

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR
PANEL OF EXAMINERS FOR EVALUATION OF Ph.D. THESIS

1	Name of Department	
2	Name of Research Scholar	
3	Registration No.	
4	Date of registration	
5	Topic of the Research	
6	Name of the Supervisor	
7	Name of the Co-Supervisor, if any	

S. No.	Name and address of the examiner not Below the rank of Professor	Contact No. (Mobile Number)	Email id
Details of External Examiners within state			
1			
2			
3			
4			
Details of External Examiners outside state / India			
5			
6			
7			
8			

Signature of Members of BOS

ANNEXURE K

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

APPLICATION FOR SUBMISSION OF Ph.D. THESIS (No Column Be Left Blank)

1	Name of Research Scholar	Recent passport size photograph with signature of the candidate across the photograph
2	Father's Name	
3	Contact Details along with Mobile No. & Email ID	
4	Name of Department	
5	Name of the faculty	
6	Registration No.	
7	Date of registration	
8	Topic of the Ph.D. Thesis	
9	Name of the Supervisor	
10	Name of the Co- Supervisor, if any	
11	Date of pre-submission seminar	
12	Details of Fee Paid	Rs.....vide receipt no. ..... (Enclose original fee receipt / Online receipt if fee paid vide online)

13. No Dues Certificate / No Objection Certificate

S. No.		**Signature of the concerned HOD / Branch Officer with seal**
1	Department / Centre / institute	
2	Library	
3	Accounts Branch	
4	Registration Branch	

DECLARATION BY THE CANDIDATE

Certified that nothing is due from me and I am submitted herewith 03 copies of by Ph.D. thesis in the Department / Centre / Institute of…… on ……

(Signature of the Research Scholar)

Endst. No……..... **Dated:…….**

1. Three Copies (twos of bound and one hard bound) of the thesis of Mr. / Ms. ……. are beings entto Secrecy Branch of GITAM.

2. The panel of examiners duly approved by the BOS has been sent on ……...

   or will be sent later on.

3. Research paper(s).....attached duly verified by the Supervisor.

(Signature of HOD / Chairman DRC)

(Signature of Director)

ANNEXURE L

MAHARSHI DAYANAND UNIVERSITY, ROHTAK

PLAGIARISM VERIFICATION REPORT

1	Name of Research Scholar	
2	Date of Registration	
2	Name of Supervisor	
3	Name of Co- supervisor if any	
4	Title of Thesis	
5	Name of Department /Centre/institute	
6	Name of the faculty	

This is to report that the above thesis was scanned for similarity detection. Process and outcome are given below:

Name of the Software Used		Total Word Count	
Similarity Index		Date of Verification	

The complete report is submitted for review by the Supervisor / HOD.

Checked by

(Name & Signature of University Librarian / Rep)

The complete report of the above thesis has been reviewed by the undersigned.

A. The Similarity Index is below accepted norms: Yes/No
B. The similarity index is above accepted norms:Yes/No If yes, because of the following reasons:

1. ……..…..…..……
2. ……..……...…….
3. ……
4. ……..……..
5. …….

The thesis may be considered for the award of degree.

Signature of Supervisor **Signature of Student**

ANNEXURE M

MAHARSHI DAYANAND UNIVERSITY, ROHTAK

DECLARATION FOR SUBMISSION OF THESIS

Name of Student	
Name of the Department/ Institute	
Name of the Faculty	
Date of Registration to Ph.D. program	
Date of Re- registration to Ph.D. program, if any	
Name of the Supervisor with Designation and Address	
Name of the Co-Supervisor with Designation and Address	
Title of the Thesis	

I / We certify that

(i) Thesis work embodies the original work of the candidate and has not been earlier submitted for Diploma/any Degree or

(ii) that research scholar has put in minimum the residency period at the designated place of work with at least one of the supervisor as prescribed in the relevant ordinance (Fulltime / Part time / Supernumerary)

(iii) Due compliance to all the provisions of Ph.D. ordinance has been met.

(Signature of student)

Names and Signature of Thesis Supervisor / Co- supervisor if any

_____

_____

ANNEXURE N

MAHARSHI DAYANAND UNIVERSITY, ROHTAK

EXAMINER'S REPORT ON Ph.D. THESIS

1. Name of the candidate :

2. Regn No. :

3. Title of Thesis :

The examiner is requested to send his / her report / recommendations under the following heads:

1. General and critical appreciation of the thesis :

2. Positive aspects of the thesis indicating the good points :

3. Negative aspects ifany :

4. Specific recommendations regarding publication of the thesis :

The evaluator will state categorically whether in his or her opinion: a) Thesis is fit for publication OR b) It should be referred back to the candidate for making modification before its publication (Please specify the reason on a separate sheet)	

5. Recommendations:

I. a)	Whether the thesis is a piece of research work characterized either by discover of new facts OR Enunciation of a new theory OR By fresh interpretation of known facts of theories	
b)	Whether the thesis evinces candidate's capacity for critical analysis/examination and judgment so far as its literary presentation is concerned	

II	The evaluator will state categorically whether in his or her opinion: a) Thesis should be accepted for the award of Ph.D. degree OR b) It should be referred back to the candidate for presenting it again in revised form OR c) It should be rejected	

6. Questions for Viva (at least six questions may be given)

(Signature of the examiner)

(Name, Designation, Address along with Mobile No. of the examiner)

Note: If necessary, blank sheets may be added to complete the report under any particular head(s) above

ANNEXURE O

MAHARSHI DAYANAND UNIVERSITY, ROHTAK

REPORT OF VIVA- VOCE EXAMINATION OF Ph.D. THESIS

1	Name of Department /Centre/institute	
2	Name of the Faculty	
3	Name of Research Scholar	
4	Registration No.	
5	Date of registration	
6	Thesis Title	
7	Date of Ph.D. Viva-Voce Examination	

COMPOSITION OF VIVA-VOCE BOARD

1	Name of the Supervisor with his / her Affiliation	
2	Name of the External Examiner with his/her affiliation	

REPORT OF THE VIVA-VOCE BOARD

The viva-voce examination is satisfactory and the candidate is recommended for the award of Ph.D. Degree	
The viva- voce examination is not satisfactory (Please specify the reasons).	

(Signature of Supervisor) **(Signature of External Examiner)**

(Counter signed by HOD / Chairman DRC)

Director

ANNEXURE P

MAHARSHI DAYANAND UNIVERSITY, ROHTAK

PROFORMA FOR RESEARCH DEGREE COMMITTEE (RDC) MEETING

Name of the Faculty	
Name of the Department/Centre/Institute	
Title of Thesis	

Ph.D. Scholar Report Card

1	Name of Research Scholar	
2	Address	
3	Telephone No. and E. Mail	
4	Mother's Name	
5	Father's Name	
6	Name and Designation of Supervisor Address	
7	Name and Designation of Co- Supervisor, If any Address	
8	Mode of Admission	
9	Date of registration (Enclose copy of Registration Letter)	

10. Details of Half Yearly Progress Reports

S. No.	**Period**	**Date on which sent to Registration Branch**	**Progress Status (Satisfactory/ Unsatisfactory)**

11. Details of Annual Seminar

Sr. No.	**Date on which annual seminar was presented**

12. Key Dates

Date of Regn.	**Date of De registration if any**	**Date of Reregistration if any**	**Date of pre submission seminar**	**Thesis submitted on**	**Viva Voce Exam held on**

13. Research paper published out of thesis :

Sr. No.	**Title of paper**	**Name of Journal / Volume/issue/ Year /Page No(s)**	**ISSN Number**	**Impact Factor / Indexing if any**
1.				
2.				
3.				

14. Conference Presentations out of thesis :

Sr. No.	Title of paper	Name of Conference	Date of conference
1.			
2.			
3.			

15. Examiners Report

Examiners	Thesis sent	Reports Received on	Recommendations of Examiner
First			
Second			

16. Main contributions made by the Research Scholar (less than 200 words)

17. Reports of Examiners (each less than 150 words)

Examiner 1 :

Examiner 2 :

18. Recommendations of External Examiners who conducted the viva voce

19. Correction. If any indicated in the reports :

20. Corrections carried out if any :

Supervisor

Counter signed by HOD/Chairman DRC

Recommendation of RDC Committee

Recommended / Not Recommended for the award of Ph.D. Degree		
(HOD / Director)	**(COE)**	**(Dean of the Faculty)**
Dean (R&D) / Associate Dean (R&D)	**(Dean Academic Affairs)**	**(Vice- Chancellor)**

ANNEXURE Q

(Title of Thesis)

A Thesis

Submitted in fulfilment of the requirements for the award of Degree of

DOCTOR OF PHILOSOPHY
(Name of Discipline)
(Name of the Faculty)

By (Name of candidate)
(Reg. No .....)

YEAR OF SUBMISSION : _____

(Name of the Co-Supervisor, if any) **(Name of the Supervisor)**

(Name of the Department/Centre/Institute),
MAHARSHI DAYANAND UNIVERSITY,
ROHTAK-124001 (HARYANA)

Annexure AC/6.7

~~Annexure A4~~

Maharshi Dayanand University, Rohtak

(A State University Established Under Haryana Act No. XXV of 1975)
A+ Grade University Accredited by NAAC

No. ACS-I/II/III/2026/ 16320-363
Dated : 30/6/2026

To

1. All the HoDs/ Directors of UTDs/Institutes/Centers,M.D. University, Rohtak
2. Director, MDU-CPAS, Gurugram

Sub:- Amendment in Assessment Mechanism of various Programs under NEP-2020.

Sir/Madam,

In terms of orders passed by competent Authority, following is brought to your notice for further necessary action :-

1. The Formative Assessment Mechanism of UG, PG, PG Diploma, Ph.D Programs and Certificate Courses is rolled back to the previous system of Term End Examinations Mechanism comprising Internal Assessment (30%) and Term End Examinations (70%) except in case of Multidisciplinary and Value Added Courses in UG Programs 2026-27.
2. The aforesaid amendment made in the Formative Assessment shall be implemented in all semesters of UG, PG, PG Diploma, Ph.D Programs and Certificate Courses under NEP-2020 w.e.f. the session 2026-27 including the students admitted in the academic session 2025-26.
3. The reappear cases in Formative Assessment of students admitted in 2025-26, if any, will be allowed for assessment in the same pattern in which he/she appeared in previous semester. For this propose, each such student will have to submit the reappear form as per examination rules.

In light of aforementioned directions, the HoDs/Directors of UTDs/Centres/Institutes are requested to undertake necessary steps for amendments/ updation of Scheme of Examination (SOE) and Syllabi of related UG, PG, PG Diploma, Ph.D. Programs and Certificate Courses.The revised/updated Scheme of Examination (SOE) and Syllabi must be supplied within 15 days from the date of issuing this letter.

This may be treated as most urgent so that the amended/updated SOE/Syllabi are uploaded on the University Website well in time before start of the next Academic Session 2026–27.

30/6/26
Assistant Registrar (Academic)
for REGISTRAR

Endst. No. ACS-I/II/III/2026/ 16364-564 **Dated:** 30/6/2026

Copy of the above is forwarded to the following for information and necessary action :-

1. Deans of Faculties, M.D. University, Rohtak
2. Director, MDU-CPAS, Gurugram
3. Director, CCDD, M.D. University Rohtak
4. Controller of Examinations, M.D. University, Rohtak
5. Director, IQAC, M.D. University, Rohtak
6. Director, University Computer Centre, M.D. University, Rohtak
7. All Principals/Directors of the Colleges/Institutes affiliated to M.D. University, Rohtak
8. Deputy/Assistant Registrar (Secrecy/Conduct/Result-I,II,III,IV), M.D. University, Rohtak.
9. OSD/PA to the Vice-Chancellor/Dean Academic Affairs/Registrar (for kind information to the Vice-Chancellor/Dean Academic Affairs/Registrar) M.D. University, Rohtak.

30/6/26
Assistant Registrar (Academic)
for REGISTRAR

UNIVERSITY INSTITUTE OF ENGINEERING & TECHNOLOGY MAHARSHI DAYANAND UNIVERSITY, ROHTAK

SCHEME AND SYLLABI FOR Ph.D COURSE WORK
(MECHANICAL ENGINEERING)
FOR DOCTOR OF PHILOSOPHY (Ph.D) IN MECHANICAL ENGINEERING
(w.e.f. the Session 2025-26)

Program Specific Outcomes: The students upon completion of Ph.D (Mechanical Engineering) Course Work program will be able to:

PSO1 Produce a well-developed research proposal and select an appropriate methodology with which to conduct the research and defend the methodology of their selection.

PSO2 Understand the various tasks required to carry out the research.

PSO3 Find the resources needed to perform the research process.

PSO4 Documentation and its findings in the individual research area.

PSO5 Understand the most advanced research in the candidate's specialization area of Mechanical Engineering respectively

Duration: One Semester (Six months)

Total Credits: 12 credits

S. No.	Course Code	Course Title	Marks	Hours per Week	Credits
1.	23MEEPH11C1 (Compulsory)	Research Methodology & Its Relevance in Mechanical Engineering	**100**	**4 Hours**	**4**
2.	24CCPH11C1 (Compulsory for all Ph.D. Course Work)	Research and Publication Ethics	**50**	**2 Hours**	**2**
3.	23MEEPH11C2 **Or** 23MEEPH11C3 **Or** 23MEEPH11C4 **or** 23MEEPH11C5	**Elective-1**	**100**	**4 Hours**	**4**
4.	23MEEPH11C6 **Or** 23MEEPH11C7 **Or** 23MEEPH11C8	**Elective-2**	**50**	**2 Hours**	**2**
	Total		**300**		**12**

Note: The compulsory course on 'Research and Publication Ethics' shall be offered by Chaudhary Ranbir Singh Institute of Social and Economic Change.

List of Electives Papers

Students can choose any one of the elective papers from each of the following categories:

Elective-1	
23MEEPH11C2	COMPUTER AIDED DESIGN
23MEEPH11C3	ADVANCED MECHANICS OF SOLIDS
23MEEPH11C4	ADVANCED MANUFACTURINGTECHNIQUES
23MEEPH11C5	QUALITY & RELIABILITYMANAGEMENT
Elective-2	
23MEEPH11C6	NON-CONVENTIONALMACHINING
23MEEPH11C7	SOLAR ENERGY
23MEEPH11C8	ADVANCE HEAT AND MASSTRANSFER

Note: More Elective Papers may be added from time to time depending upon the availability of the Expertise in the Department and its suitability for the researchers.

:

Name of the Program	Ph.D. Course work in Mechanical Engineering	**Program Code**	MEPH
Name of the Course	Research Methodology & Its Relevance in Mechanical Engineering	**Course Code**	23MEEPH11C1
Hours/Week	4	**Credits**	4

Note: The Formative Assessment Criteria for this Course is as Follows:

- Written test (2 X 15)	: 30
-MCQs/ Quizzes/ Group Discussion (2 X 10)	:20
-Case study / Mini project (1 X 25)	:25
-Seminar/ Presentation (2 X 10)	:20
- Attendance	: 05
Total	**:100**

Course Outcomes: By the end of the course the students will be able to:

1. Learn the concept of research, research process, types of research, research models and basics formats of report writing.
2. Learn the use of statistical analytic techniques for data analysis and testing of hypothesis
3. Identify the differences between measurement and scaling and how sample is selected and determined using various approaches.
4. To learn various types of data collection techniques, types of data, analysis and interpretation ofdata.
5. To understand the role of computer in mathematical and statistical analysis in researchandto get the idea about applications of relevant research methodologies with special reference to research in Mechanical Engineering.

Course Outcomes:

1. Learn the concept of research, research process, types of research, research models and basics formats of reportwriting.

Learn the use of statistical analytic techniques for data analysis and testing ofhypothesis.

3. Identify the differences between measurement and scaling and how sample is selected and determined using variousapproaches.

To understand sources of data collection and how data is collected from differentsources.

5. To understand the concept of interpretation and role of computer in mathematical and Statistical analysis with applications of relevant research methodologies used in Mechanical Engineering..

Unit - I
Introduction to Research: Types, Research process and steps in it, Hypothesis, Research proposals and aspects. Research Design: Need, Problem Definition, variables, research design concepts, Literature survey and review, Research design process, Errors in research. **Research Modeling:** Types of Models, Model building and stages, Data consideration and testing, Heuristic and Simulation modeling. Report Writing: Pre writing considerations, Thesis writing, Formats of report writing, formats of publications in Research journals.
Unit - II
Design of Experiments: Objectives, strategies, Factorial experimental design, Designing engineering experiments, basic principles-replication, randomization, blocking, Guidelines for design of experiments; Single Factor Experiment: Hypothesis testing, Analysis of Variance (ANOVA) components for fixed effect model; Total, treatment and error of squares, Degrees of freedom, Confidence interval; ANOVA for random effects model, Estimation of variance components, Model adequacy checking, Chi-Square Test. Two factor Factorial Design, Basic definitions and principles, main effect and interaction, response surface and contour plots, General arrangement for a two-factor factorial design; Models-Effects, means and regression, Hypothesis testing.
Unit - III
Measurement and Scaling Techniques: Measurement: concept, Levels and components of Measurement, Techniques of Developing Measurement Tools, sources of Error in measurement, Tests of Sound Measurement. Scaling: Meaning of Scaling, Bases of Scales-classification, important scaling techniques-Rating and Ranking. Approaches of the scale construction, different types of scales-Arbitrary Scales, Differential Scales, Summated Scales, Cumulative Scales, factor Scales. **Sampling:** Sampling Theory, Sandler's A-test, Concept of standard errors, Estimating Population mean (μ), Sample size and its Determination.
Unit - IV
Qualitative Research: Themes of qualitative Research, Research Strategies; Data collection Techniques, combining qualitative and quantitative research. **Data Analysis and Interpretation of Data:** Data Analysis: Paramedic and Nonparametric data, Descriptive and Inferential Analysis. Interpretation of Data: Forms of Interpretation, Prerequisites for Interpretation, Precautions in Interpretation, conclusions and Generalizations, sources of Errors in Interpretations, Mathematical and statistical analysis using software tools like MAT Lab, SPSS or free wares tools. CAD (Computer-Aided Design) for 2D/3D modeling (AutoCAD, SOLIDWORKS, Fusion 360,

CATIA, Inventor, NX) and CAE (Computer-Aided Engineering) for analysis (ANSYS, Abaqus) to simulate performance, alongside tools for data analysis and automation (MATLAB). The computer:Its role in Mechanical Engineering research.
Suggested Readings: 1) Montgomery, Douglas C. Design and Analysis of Experiments (John Wiley & Sons). 2) Montgomery, Douglas C. & Runger, George C. Applied Statistics & Probability for Engineers (Wiley India) 3) Kothari C.K. Research Methodology- Methods and Techniques (New Age International, New Delhi) 4) Krishnaswamy, K.N., Sivakumar, Appa Iyer and Mathiranjan M. Management Research Methodology; Integration of Principles, Methods and Techniques (Pearson Education, New Delhi) 5) The complete reference Office Xp – Stephan L. Nelson, Gujulia Kelly (TMH). 6) Any other book(s) covering the contents of the paper in more depth. **Note: Latest and additional good books may be suggested and added from time to time.**

Subject: RESEARCH AND PUBLICATION ETHICS

(24CCPH11C1)

(Compulsory for all Ph.D. Course Work)

Name of the Program	Ph.D. Course work	**Program Code**	MEPH
Name of the Course	**RESEARCH AND PUBLICATION ETHICS**	**Course Code**	223CCPH11C1
Hours/Week	2	**Credits**	2

Note: The Formative Assessment Criteria for this Course is as Follows:

- Written test (2 X 5) : 10
- MCQs/ Quizzes/ Group Discussion (2 X 10) :20
- Case study / Mini project/ Role Play (1 X 5) :05
- Seminar/ Presentation (1 X 10) :10
- Attendance : 05

Total **:50**

Course Objectives:

To study the philosophy ofethics

To study the scientific conduct ofresearch

To study the publicationethics

To know about various journal citationdatabases

To know the importance of qualitypublications

Course Outcomes:

By completion of course the student is able to understand

Ethics in conduct of scientificresearch

Know the scientificmisconducts

How to avoid plagiarism and what are the penalties ofplagiarism

Know the quality of researchpublications

Write research and reviewarticles.

Unit – I

PHILOSOPHY AND ETHICS

Introduction to philosophy: definition, nature and scope, concept,branches

Ethics: definition, moral philosophy, nature of moral judgments andreactions

SCIENTIFIC CONDUCT

Ethics with respect to science andresearch

Intellectual honesty and researchintegrity

Scientific misconducts: Falsification, Fabrication, and Plagiarism(FFP)

Redundant publications: duplicate and overlapping publications, salamislicing

Selective reporting and misrepresentation ofdata

Unit - II

PUBLICATION ETHICS

Publication ethics: definition, introduction andimportance

Best practices / standards setting initiatives and guidelines: COPE, WAME,etc.

Conflicts ofinterest

Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa,types

Violation of publication ethics, authorship and contributorship

Identification of publication misconduct, complaints andappeals

Predatory publishers andjournals

Unit - III

DATABASES AND RESEARCH METRICS

Databases

Indexingdatabases

Citation databases: Web of Science, Scopus,etc.

ResearchMetrics

Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, CiteScore

Metrics: h-index, g index, i10 index,altmetrics

Unit – IV

Practice

OPEN ACCESS PUBLISHING

Open access publications and initiatives

SHERPA/RoMEO online resource to check publisher copyright & self-archivingpolicies

Software tool to identify predatory publications developed bySPPU

Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested,etc.

PUBLICATION MISCONDUCT

GroupDiscussions

Subject specific ethical issues, FFP,authorship

Conflicts ofinterest

Complaints and appeals: examples and fraud from India andabroad

(B) Software tools (2 hrs.) :Use of plagiarism software like Tumitin, Urkund and other open source softwaretools

References:

Bird, A. (2006). Philosophy of Science,Routledge

P. Chaddah (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarised.

Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance(2019).

Beall, J (2012), Predatory publishers are corrupting open access. Nature, 489(7415), 179.

National Academy of Sciences, National Academy of Engineering and Institute of Medicine (2009). On being a Scientist: A guide to Responsible Conduct in Research, Third Edition, national Academicpress.

Elective-1	
23MEEPH11C2	COMPUTER AIDED DESIGN
23MEEPH11C3	ADVANCED MECHANICS OF SOLIDS
23MEEPH11C4	ADVANCED MANUFACTURINGTECHNIQUES
23MEEPH11C5	QUALITY & RELIABILITYMANAGEMENT
Elective-2	
23MEEPH11C6	NON-CONVENTIONALMACHINING
23MEEPH11C7	SOLAR ENERGY
23MEEPH11C8	ADVANCE HEAT AND MASSTRANSFER

	Ph.D. Course work in Mechanical Engineering	**Program Code**	MEPH
Name of the Course	Computer Aided Design	**Course Code**	23MEEPH11C2
Hours/Week	4	**Credits**	4

Note: The Formative Assessment Criteria for this Course is as Follows:

- Written test (2 X 15) : 30
- MCQs/ Quizzes/ Group Discussion (2 X 10) :20
- Case study / Mini project (1 X 25) :25
- Seminar/ Presentation (2 X 10) :20
- Attendance : 05

Total :100

Course Objectives:

To study the basics of geometric and solidmodelling

To learn about 2D & 3Dtransformations.

Tostudytheanalyticalandsyntheticcurves.

Tolearnaboutsolidrepresentationscheme.

To study about surface modelling and theirtypes

Course Outcomes:

By completion of course the student is able to understand/learn

The concept of computergraphics.

The different algorithm ofcurves.

Identify the differences wireframe, surface and solidmodelling.

Transformations in 2D &3D.

Surfaces parametric representations & solid representationschemes

Unit – I

Introduction

Introduction,Reviewofvectors&Matrices,Basicsofgeometricandsolidmodeling,explicit, implicit, intrinsic and parametric equations, coordinatesystems.

Transformations

Introduction,transformationofpointsandline,2-Dtranslation,shearing,rotation,reflection, scaling and combined transformation, homogeneous coordinates, 3-D scaling, shearing, rotation,reflectionandtranslation,combinedtransformations,orthographic,axonometric, oblique and perspective projections.

Unit - II

Curves

Geometry and topology, algebraic and geometric forms of straight lines, circles, conics, cubic splines, Ferguson curve, Hermite curve, bezier curves and B-spline curves, NURBS, composite curves, tangents and normal, blending functions, reparametrization.

Unit – III
Solids Solid models and representation schemes, their properties, boundary representation, constructive solid geometry, sweep representation, cell decomposition, octree encoding, spatial occupancy enumeration.
Unit - IV
Surfaces Algebraic and geometric forms, tangents and twist vectors, normal, blending functions, reparametrization.Planesurface,sixteenpointform,fourcurveform,ruledsurface,surface ofrevolution,tabulatedcylinder,loftedsurface,bi-cubicsurface,beziersurface,B-spline surfaces, Coons' patch, blending surface, offset surface, rational surface.
Reference Books: CAD/CAM by Groover and Zimmer, PrenticeHall CAD/CAM: Theory and Practice by I. Zeid, McGrawHill Geometric Modeling by M.E.Mortenson

Name of the Program	Ph.D. Course work in Mechanical Engineering	**Program Code**	MEPH
Name of the Course	Advanced Mechanics of Solids	**Course Code**	23MEEPH11C3
Hours/Week	4	**Credits**	4

Note: The Formative Assessment Criteria for this Course is as Follows:

- Written test (2 X 15) : 30
- MCQs/ Quizzes/ Group Discussion (2 X 10) :20
- Case study / Mini project (1 X 25) :25
- Seminar/ Presentation (2 X 10) :20
- Attendance : 05

Total :100

Course Objectives:

To study about 3-dimensional stresstensor

To study about three dimensionalstrains

To study the effect of unsymmetricalbending.

To learn about bending of plates and contactstresses.

To study about buckling of columns and beam on elasticfoundation.

Course Outcomes:

By completion of course the student is able to understand/learn

The concept of computergraphics.

The different algorithm ofcurves.

Identify the differences wireframe, surface and solidmodelling.

Transformations in 2D &3D.

Surfaces parametric representations & solid representationschemes

Unit – I

Three Dimensional Stress and Strain:

PrincipalstressesandPrincipalstrains,Mohr'scirclerepresentationoftri-axialstressesand strains.

Unsymmetrical Bending:

Shear centres for sections with one axis of symmetry. Shear centre for any unsymmetrical section, stress and deflection of beams subjected to unsymmetrical bending.

Unit - II

Bending of Plates:

Basic definitions, Stress, Curvature and Moment relations, Basic Equation of plate deflection. Different boundary conditions simply supported rectangular plates, axis symmetric loaded circular plates.

Contact Stresses:

Due to Two Spherical Surfaces in Contact, Due to Two Parallel Cylindrical Rollers in Contact, Due to Two Curved Surfaces of Different Radii.
Unit – III
Buckling of Columns: Beam columns with single concentrated load, number of concentrated loads, continuous lateral load, end couple, couples at both ends of the column, triangular loads and combined loads.
Unit - IV
Beam on Elastic Foundations: General Theory, Infinite, Semi-infinite, and Finite beams, Classification of Beams. Beam supported by equally spaced elastic elements.
Reference Books: AdvancedStrengthandAppliedElasticity'byUgural&Fenster,PrenticeHall. Advanced Mechanics of Solids' by L., Srinath,TMH Intermediate Mechanics of Materials' by J. R. Barber,McGraw-Hill Introduction to Solid Mechanics' by Shames & Pitarresi,PHI

Name of the Program	Ph.D. Course work in Mechanical Engineering	**Program Code**	MEPH
Name of the Course	Advanced Manufacturing Techniques	**Course Code**	23MEEPH11C4
Hours/Week	4	**Credits**	4

Note: The Formative Assessment Criteria for this Course is as Follows:

- Written test (2 X 15)	: 30
-MCQs/ Quizzes/ Group Discussion (2 X 10)	:20
-Case study / Mini project (1 X 25)	:25
-Seminar/ Presentation (2 X 10)	:20
- Attendance	: 05
Total	**:100**

Course Objectives:

To study about advance manufacturingtechniques

To study about robust designmethodology

Tostudyaboutqualityfunctiondeployment

To learn about agile manufacturing and concurrentengineering.

To study about advance materials and weldingprocesses.

Course Outcomes:

By completion of course the student is able to understand/learn

The advance manufacturingtechniques.

The quality functiondeployment.

The agile manufacturing and virtual manufacturingsystem.

Rapid prototypingtechnology.

Advance weldingprocesses

Unit – I

Different Techniques:

Manufacturing Change in manufacturing system, manufacturing strategies, Advanced manufacturing Technologies for Indian Industries, Robust design methodology for Quality Engineering and management

Unit - II

Six Sigma, Taguchi concepts, Quality function deployment, Rapid proto typing: Technology and challenges, Introduction and concepts of JIT, CAPP, MRP, CIMS, FMS, SCM, TPM, Kaizan

Unit – III

Agile manufacturing, Lean Manufacturing, Virtual manufacturing system, kanban, Theory of constrains, synchronous manufacturing, concurrent Engineering

Unit - IV
Advanced Techniques: Manufacturing and Environmental issues, Advanced materials and their application in manufacturing, Abrasive flow machining , Advanced welding processes (New Solid state Welding, Arc welding and Radiation welding Processes).
Reference Books: Modern Machining Processes, P.C. Pandey and H.S. Shan,TMH Machining Science, Ghosh and Mallik,AEW Non-TraditionalManufacturingProcessesbyG.F.Benedit,MarcelDekker. Advanced Machining Processes by V.K. Jain, AlliedPuiblishers. AdvancedTopicsofStrengthofMaterials'byU.C.Jindal,GalgotiaPublication.

.**Name of the Program**	Ph.D. Course work in Mechanical Engineering	**Program Code**	MEPH
Name of the Course	Quality & Reliability Management	**Course Code**	23MEEPH11C5
Hours/Week	4	**Credits**	4

Note: The Formative Assessment Criteria for this Course is as Follows:

- Written test (2 X 15)	: 30
-MCQs/ Quizzes/ Group Discussion (2 X 10)	:20
-Case study / Mini project (1 X 25)	:25
-Seminar/ Presentation (2 X 10)	:20
- Attendance	: 05
Total	**:100**

Course Objectives:

To study quality and factors influencing quality

To study different control charts and their significance

To study about sampling

To learn about total quality management.

To study about reliability.

Course Outcomes:

By completion of course the student is able to understand/learn

The concepts of quality.

The different control charts, their advantages and disadvantages.

Acceptance sampling

TQM and ISO9000.

Reliability and factor affecting reliability

Unit – I

Introduction:

Conceptofquality,Need,Factorinfluencingquality,Typesofquality,Qualitycontrol,Costof quality control, Quality assurance, Benefits, Modern concept, Inspection and quality control, Quality characteristics, Quality circles.

Statistical Concepts and Control Charts:

Review of fundamental statistical concept, Frequency distribution, Central tendency, measures of dispersion, Probability distributions, statistical quality control, Theory of control charts,Controlchartsforvariablesandattributes(*x*,R,P,npandCchart),theiradvantages and disadvantages, Applications.

Unit - II

Acceptance Sampling: Introduction, Advantages and Disadvantages, Operating Characteristics curve, Producer's and consumer's risk, Quality indices for acceptance sampling plans, Types of sampling Plans-single double sequential sampling plan, Sampling plan for variables, continuous sampling plans, Skip lot sampling plans, Chain sampling plan.
Unit – III
Total Quality Management: Introduction, Concept of Total quality, Quality function, Deployment tools for continuous quality improvement, The ISO 9000 family of standards, Six Sigma and other extensions of TQM.
Unit - IV
Reliability: Introduction, Factor effecting Reliability, Failure and its types, Failure curve, Majors of reliability, MTBF, MTTF, Relationship b/w reliability failure rate and MTBF and its characteristics, System reliability (components in series and parallel) System reliability with stand by components, Redundancy, Operating characteristics curve, Reliability and life testing plans, Types of test, Maintainability, Availability.
Reference Books: Statistical Quality control by C.Gupta. Fundamental of Quality Control and Improvement by AmitavaMitra. Reliability Mathematics by B.L.AmsTadter.

Name of the Program	Ph.D. Course work in Mechanical Engineering	**Program Code**	MEPH
Name of the Course	Non-Conventional Machining	**Course Code**	23MEEPH11C6
Hours/Week	2	**Credits**	2

Note: The Formative Assessment Criteria for this Course is as Follows:

- Written test (2 X 5) : 10
- Peer discussion/debate/Extempore speech (2 X 10) :20
- Role play:05
- Essay/article/report writing :10
- Attendance :05

Total :50

Course Objectives:

To study the modern machiningprocesses

To study about EDM and wireEDM

To study laser beammachining.

Tolearnabrasivejetmachining,ultrasonicmachiningandabrasivewaterjetmachining

To study about ECM andECG

Course Outcomes:

By completion of course the student is able to understand/learn

The concepts of modern machiningprocesses.

Processes like UCM, AJM, AFF,MAF.

Identify the differences EDM and wireEDM.

Thermoelectric advanced machiningprocesses

Electrochemical and Chemicalprocesses

Unit – I

Introduction:

Need for advanced machining processes; An Overview of Modern machining processes

Unit - II

Mechanical processes:

Abrasive Jet Machining; Ultrasonic Machining; Abrasive Flow Finishing; Magnetic Abrasive Finishing; Abrasive Water Jet Machining

Unit – III

Thermoelectric advanced machining processes:

EDM; Electric Discharge Diamond Grinding; Wire EDM; Laser beam Machining; Plasma Arc Machining; Electron Beam Machining

Unit - IV

Electrochemical and Chemical Processes:

ECM; ECG; Electro stream Drilling; Electrochemical Deburring; Chemical Machining
Reference Books: Advanced Machining Processes by V.K. Jain. Allied Publishers PvtLtd ModernMachiningProcessesbyP.C.PandeyandH.S.Shan.TataMcGraw-Hill

Name of the Program	Ph.D. Course work in Mechanical Engineering	**Program Code**	MEPH
Name of the Course	Solar Energy	**Course Code**	23MEEPH11C7
Hours/Week	2	**Credits**	2

Note: The Formative Assessment Criteria for this Course is as Follows:

- Written test (2 X 5) : 10
- Peer discussion/debate/Extempore speech (2 X 10) :20
- Role play:05
- Essay/article/report writing :10
- Attendance :05

Total :50

Course Objectives:

To reduce dependency on foreign oil and fossilfuels.

To improve the quality of life and alleviate rural poverty in the un-energized and off-grid areas.

To provide basic needs such as lights, education, entertainment and communication through affordable and reliable source of solarenergy.

To promote the use of sustainable, economic and least-cost decentralized electrification solutions for areas not feasible for grid connection/extension in partnership with the local government units, semi-private and privatesectors.

To apply solar energy technology as the enabling technology for sustainable development.

To apply the solar energy in the field of agriculture sector to save the crops from uneven environmentalconditions.

Course Outcomes:

By completion of course the student is able to understand/learn

Goodunderstandingofusingsolarenergyinlighting,storage,electricityproduction, electrification of vehicles, solar cooking etc.etc.

Good understanding of storage technologies, distribution grid, smart grid including sensors.regulationandcontrol,andboth“standalone”systemsandlargeintegrated distributionsystems.

Good understanding of national and international regulations and framework conditions for renewable energy systems. This also includes different price models andactions.

Profoundknowledgeinaspecialfieldsuchassolarenergy,storage,smartgrid.

Having approximately specialized knowledge in a field of renewable energy systems achieved through the work on a masterthesis.

Good knowledge about the applications of solar energy in the field of agriculture sector with specific reference to increased productivity, reduction of post-harvest losses,rapiddryingofcropstoincreasethestorageofagricultureproduce.

Goodknowledgeaboutpurificationofwaterusingsolarenergyusingsolardistillation process.

Unit – I

Solar Radiation

Characteristics, Earth-sun relation, Estimation on horizontal and tilted surfaces, Radiation characteristics of opaque and transparent material.

Flat Plate Collectors

Description, theory, Heat capacity effects, Time constant, Measurement of thermal performance, Air heaters.

Unit - II

Evacuated Tubular Collectors

One axis, Two axis, Solar tracking, Cylinderical, Spherical and Parabolic and Paraboloid concentrators. Composite collectors, Central receiver collectors.

Heat Storage

Sensible and latent heat storage, Chemical energy system, performance calculations.

Unit – III

Flow Systems

Natural and forced flow systems, Water heating systems for domestic, industrial and space heating requirements, Solar distillation.

Solar Heating and Cooling

Direct, indirect and isolated heating concepts, Cooling concepts, Load calculation methods, Performance evaluation methods.

Unit - IV

Solar Thermal Power Generation

Introduction, Paraboloidal concentrating systems, Cylinderical concentrating systems, Central receiver system.

Solar Refrigeration and Air Conditioning Systems

Introduction, Solar refrigeration and air conditioning systems, Solar desiccant cooling

Reference Books:

Solar Thermal Engineering Process by Duffie andBeckman.

Advanced Solar Energy Technology by H.P.Garg.

Solar Energy by S.P.Sukhatme.

Solar Energy by J.S.Hsieh.

Solar Thermal Engineering by P.J.Lunde.

Name of the Program	Ph.D. Course work in Mechanical Engineering	**Program Code**	MEPH
Name of the Course	Advance Heat and Mass Transfer	**Course Code**	23MEEPH11C8
Hours/Week	2	**Credits**	2

Note: The Formative Assessment Criteria for this Course is as Follows:

- Written test (2 X 5) : 10
- Peer discussion/debate/Extempore speech (2 X 10) :20
- Role play:05
- Essay/article/report writing :10
- Attendance :05

Total :50

Course Objectives:

To study about conduction and convection in 1D and2D.

To study about heatexchanger

To study about masstransfer

To study aboutradiation

To study about different types of heatpipes

Course Outcomes:

By completion of course the student is able to understand/learn

Heat transfer modesin

Heat exchangers and theirapplications

Different types of heatpipes.

Concept of masstransfer

Regimes ofboiling

Unit – I

Conduction

Review of the basic laws of conduction, convection and radiation. General heat conduction equation in different co-ordinates. One dimensional steady state conduction with variable. Thermal conductivity and with internal distributed heat sources, extended surfaces review, Taperedfins,designconsiderations.Twodimensionalsteady-stateconduction,semi-infinite andfiniteflatplatesandcylinders,graphicalmethod,relaxationtechnique.Unsteadystate conduction in solids with infinite thermal conductivity, infinite thick-solids, periodic variation, solutions using Grolber's and Heisfer's charts.

Unit - II

Convection

Hydrodynamic and thermal boundary layers, differential equations, momentum and energy and their solutions, heat transfer in turbulent flow, eddy heat diffusivity, Reynold's analogy between skin friction and heat transfer. Free convection, empirical correlations, regimes of boiling, Nucleate and film boiling.

Unit – III

Heat Exchangers

Introductions,effectivenessandnumberoftransferunits,designofheatexchangers. Radiation Introduction, laws of radiation, heat exchange between black bodies and non-black bodies, shape factor algebra, Radiation shields, electrical net-work approach of radiation heat exchange.

Unit - IV

Mass Transfer

Introduction,Fick'slaw,Generalequationofmassdiffusionsteadystate,diffusionthrougha plain membrane, diffusion of water vapour through air, Mass transfer coefficient, convective masstransfer.

Heat Pipe

Introduction, Working of Heat pipe, Different types of Heat Pipe, Detail of Heat Pipe components, Advantages of Heat Pipe, Application of Heat Pipe, Performance of Heat Pipe, Limitation of Heat Pipe, Analysis and Design of Heat Pipe.

Reference Books:

1. Principles of Heat Transfer byKreith
2. Heat Transfer byHolman
3. Fundamentals of Heat and Mass-transfer by D.S.Kumar
4. Heat and mass transfer by EckertDarke.

Annexure AC/6.8

~~Annexure A5~~

Maharshi Dayanand University, Rohtak

(A State University Established Under Haryana Act No. XXV of 1975)
A+ Grade University Accredited by NAAC

No. ACS-I/II/III/2026/ 16320-363
Dated : 30/6/2026

To

1. All the HoDs/ Directors of UTDs/Institutes/Centers,M.D. University, Rohtak
2. Director, MDU-CPAS, Gurugram

Sub:- Amendment in Assessment Mechanism of various Programs under NEP-2020.

Sir/Madam,

In terms of orders passed by competent Authority, following is brought to your notice for further necessary action :-

1. The Formative Assessment Mechanism of UG, PG, PG Diploma, Ph.D Programs and Certificate Courses is rolled back to the previous system of Term End Examinations Mechanism comprising Internal Assessment (30%) and Term End Examinations (70%) except in case of Multidisciplinary and Value Added Courses in UG Programs 2026-27.
2. The aforesaid amendment made in the Formative Assessment shall be implemented in all semesters of UG, PG, PG Diploma, Ph.D Programs and Certificate Courses under NEP-2020 w.e.f. the session 2026-27 including the students admitted in the academic session 2025-26.
3. The reappear cases in Formative Assessment of students admitted in 2025-26, if any, will be allowed for assessment in the same pattern in which he/she appeared in previous semester. For this propose, each such student will have to submit the reappear form as per examination rules.

In light of aforementioned directions, the HoDs/Directors of UTDs/Centres/Institutes are requested to undertake necessary steps for amendments/ updation of Scheme of Examination (SOE) and Syllabi of related UG, PG, PG Diploma, Ph.D. Programs and Certificate Courses.The revised/updated Scheme of Examination (SOE) and Syllabi must be supplied within 15 days from the date of issuing this letter.

This may be treated as most urgent so that the amended/updated SOE/Syllabi are uploaded on the University Website well in time before start of the next Academic Session 2026–27.

30/6/26

Assistant Registrar (Academic)
for REGISTRAR

Endst. No. ACS-I/II/III/2026/ 16264-564 **Dated:** 30/6/2026

Copy of the above is forwarded to the following for information and necessary action :-

1. Deans of Faculties, M.D. University, Rohtak
2. Director, MDU-CPAS, Gurugram
3. Director, CCDD, M.D. University Rohtak
4. Controller of Examinations, M.D. University, Rohtak
5. Director, IQAC, M.D. University, Rohtak
6. Director, University Computer Centre, M.D. University, Rohtak
7. All Principals/Directors of the Colleges/Institutes affiliated to M.D. University, Rohtak
8. Deputy/Assistant Registrar (Secrecy/Conduct/Result-I,II,III,IV), M.D. University, Rohtak.
9. OSD/PA to the Vice-Chancellor/Dean Academic Affairs/Registrar (for kind information to the Vice-Chancellor/Dean Academic Affairs/Registrar) M.D. University, Rohtak.

30/6/26

Assistant Registrar (Academic)
for REGISTRAR

UNIVERSITY INSTITUTE OF ENGINEERING & TECHNOLOGY MAHARSHI DAYANAND UNIVERSITY, ROHTAK

SCHEME AND SYLLABI FOR Ph.D COURSE WORK (ELECTRICAL ENGINEERING)

FOR

DOCTOR OF PHILOSOPHY (Ph.D.) IN ELECTRICAL ENGINEERING

(w.e.f. the session 2025-26)

Program Specific Outcomes:

The students upon completion of Ph.D (Electrical Engineering) coursework program, will be able to:

PSO1 Develop a well-thought-out research proposal, establish an appropriate approach to find the research gap, and defend the proposed research proposal.

PSO2 Identify the different approaches that are essential to conclude the research proposal.

PSO3 Locate the resources required to carry out the research proposal.

PSO4 Documentation and its conclusions within the specific field of research.

PSO5 Recognize the most recent findings in the candidate's field of expertise, electrical engineering.

Scheme for Ph.D. coursework

Sr.No	Course Code	Nomenclature of Course	marks	Hours /Week	Credits
1.	23CCPH11C1 (Compulsory for all Ph.D. Course work)	Research and Publication Ethics	50	2 Hours	2
2.	23CCPH11C2 (Compulsory for all Ph.D. Course work)	Research Methodology	100	4 Hours	4
3.	23EEPH11C1	Review of Literature and Seminar (in Relevant Research Area)	50	4 Hours	2
4.	23EEPH11C2	Departmental – Elective Course (in Relevant Research Area)	100	4 Hours	4
	Total marks/Credits		**300**		**12**

Common courses:

23CCPH11C1: Research and Publications Ethics: The course shall be offered by Chaudhary Ranbir Singh Institute of Social and Economic Change.

23CCPH11C2: Research Methodology: (Quantitative Techniques and Computer Applications in Research).

Departmental course:

i. 23EEEPH11C1: Review of Literature and Seminar (in Relevant Research Area)

ii. Elective Subject (Departmental Elective Subjects): Students can choose any one of the elective papers from each of the following categories:

List of Department Electives Subjects:

1	23EEEPH11C2	POWER SYSTEM PLANNING
2	23EEPH11C3	OPTIMAL OPERATION IN POWER DISTRIBUTION SYSTEMS
3	23EEPH11C4	POWER DISTRIBUTION SYSTEM
4	23EEPH11C5	INTELLIGENT CONTROLLERS
5	23EEPH11C6	POWER SYSTEM PROTECTION

Note: Departmental elective subjects will be offered according to the availability of expertise and the required infrastructure within the department.

Subject: RESEARCH METHODOLOGY & ITS RELEVANCE IN ELECTRICAL ENGINEERING

Name of the Program	Ph.D. Course work in Electrical Engineering	**Program Code**	EEPH
Name of the Course	**Research Methodology**	**Course Code**	**23CCPH11C2**
Hours/Week	4	**Credits**	4

Note: The formative assessment criteria for this course is as follows:

Written test (2 X 15)	:30
MCQs/ Quizzes/ Group Discussion (2 X 10)	:20
Case study / Mini project (1 X 25)	:25
Seminar/ Presentation (2 X 10)	:20
Attendance	:05
Total	**:100**

Course Objectives:

1. To understand the fundamental concepts of the research process, various models of research, and report writing concepts.
2. To learn various statistical analysis techniques for data analysis and hypothesis testing.
3. To understand the concepts of measurement and scaling & their various techniques and sample size determination.
4. To learn various types of data collection techniques, types of data, analysis and interpretation of data.
5. To understand the role of computers in mathematical and statistical analysis in research and to get an idea about applications of relevant research methodologies with special reference to research in computer science.

Course Outcomes:

1. Learn the concept of research, research process, types of research, research models, and basic formats of report writing.
2. Learn the use of statistical analytic techniques for data analysis and testing of hypotheses.
3. Identify the differences between measurement and scaling and how the sample is selected and determined using various approaches.
4. To understand sources of data collection and how data is collected from different sources.
5. To understand the concept of interpretation and the role of the computer in mathematical and Statistical analysis, with applications of relevant research methodologies used in computer science& Engineering.

Unit - I

Element of Research: Scientific process meaning and definition, a brief history of scientific process. Introduction to research methodology- Meaning of research, objective of research, types of research, significance of research, problem encountered by researchers in india, Research problem- Definition, necessity and techniques of defining research problem, formulation of research problem, objective of research problem, research design- Meaning, need and features of good research design, types of research designs, basic principles of Experimental design. Sampling design, census

and sample surveys, different types of sample designs, characteristics of good sample design, Techniques of selecting a random sample. Data collection-primary and secondary data, methods of selecting primary and secondary data,

Unit - II

Sampling Hypothesis & Statistical Analysis: hypothesis- definition, testing of hypothesis, procedures of hypothesis testing, flow diagram for hypothesis testing, parametric and non-parametric tests for testing of hypothesis, limitations of tests of hypothesis.

Hypothesis tests- One sample test-two sample tests/ chi square tests, association of attributes. T-tests, statical analysis, correlation and regression analysis- analysis of variance, completely randomized design, randomized complete block design, Latin square design-partial and multiple correlations – discriminent analysis - cluster analysis – principle component and factor analysis, repeated measure analysis. Probability and probability distributions; Binomial, Poisson, distribution, Basic ideas of testing of hypotheses; Tests of significance based on normal distributions.

Unit - III

Paper Writing and Report Generation: Basic concepts of paper writing and report generation, review of literature, concepts of bibliography and references, significance of report writing, steps of report writing, types of research reports, methods of presentation of report.

Unit - IV

Computer Applications in Research: Computer Applications: Fundamentals of computers-Definition, types of computers, RAM, ROM, CPU, I/O devices, Number systems-Binary, octal and hexadecimal, base conversion, logic gates- AND, OR, NOT, Data structure array, stack (push, pop), queue (insert, delete), linked list-singly, doubly, operating system-definition, types of operating system, uses of software's MS-Office-Power point, word, Excel and Access.

References:

1. C. R. Kothari – Research Methodology Methods and Techniques – WishwaPrakashan Publishers – Second

Name of the Program	Ph.D. Course work in Electrical Engineering	**Program Code**	EEPH
Name of the Course	Research and Publication ethics	**Course Code**	23CCPH11C1
Hours/Week	2	**Credits**	2

Note: The formative assessment criteria for this course is as follows:

Written test (2 X 5)	10
Peer discussion / Debate / Extempore speech (2X 10)	20
Role play	05
Essay / Article / Report writing	10
Attendance	05
Total	50

Course Objectives:

1. To study the philosophy of ethics
2. To study the scientific conduct of research
3. To study the publication ethics
4. To know about various journal citation databases
5. To know the importance of quality publications

Course Outcomes:

By completion of course the student is able to

1. Ethics in conduct of scientific research
2. Know the scientific misconducts
3. How to avoid plagiarism and what are the penalties of plagiarism
4. Know the quality of research publications
5. Write research and review articles.

Unit - I

PHILOSOPHY AND ETHICS

1. Introduction to philosophy: definition, nature and scope, concept, branches
2. Ethics: definition, moral philosophy, nature of moral judgments and reactions

SCIENTIFIC CONDUCT

1. Ethics with respect to science and research
2. Intellectual honesty and research integrity
3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
4. Redundant publications: duplicate and overlapping publications, salami slicing
5. Selective reporting and misrepresentation of data

Unit - II

PUBLICATION ETHICS

1. Publication ethics: definition, introduction and importance
2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
3. Conflicts of interest
4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
5. Violation of publication ethics, authorship and contributorship
6. Identification of publication misconduct, complaints and appeals
7. Predatory publishers and journals

Unit - III

DATABASES AND RESEARCH METRICS

(A) Databases

1. Indexing databases
2. Citation databases: Web of Science, Scopus, etc.

(B) Research Metrics

1. Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score
2. Metrics: h-index, g index, i10 index, altmetrics

Unit - IV

Practice

OPEN ACCESS PUBLISHING

1. Open access publications and initiatives
2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies
3. Software tool to identify predatory publications developed by SPPU
4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

PUBLICATION MISCONDUCT

(A) Group Discussions

1. Subject specific ethical issues, FFP, authorship
2. Conflicts of interest
3. Complaints and appeals: examples and fraud from India and abroad

(B) Software tools (2 hrs.) :Use of plagiarism software like Tumitin, Urkund and other open source software tools

References:

1. Bird, A. (2006). Philosophy of Science, Routledge
2. P. Chaddah (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarised.
3. Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance (2019).
4. Beall, J (2012), Predatory publishers are corrupting open access. Nature, 489(7415), 179.
5. National Academy of Sciences, National Academy of Engineering and Institute of Medicine (2009). On being a Scientist: A guide to Responsible Conduct in Research, Third Edition, national Academic press.

Name of the Program	Ph.D. Course work in Electrical Enmgineering	**Program Code**	EEPH
Name of the Course	Review of Literature and Seminar (in Relevant Research Area)	**Course Code**	23EEPH11C1
Hours/Week	4	**Credits**	2

Note: The formative assessment criteria for this course is as follows:

Written test (2 X 5)	10
Peer discussion / Debate / Extempore speech (2X 10)	20
Role play	05
Essay / Article / Report writing	10
Attendance	05
Total	50

Name of the Program	Ph.D. Course work in Electrical Engineering	**Program Code**	EEPH
Name of the Course	Power System Planning	**Course Code**	23EEEPH11C2
Hours/Week	4	**Credits**	4

Note: The formative assessment criteria for this course is as follows:

Written test (2 X 15)	:30
MCQs/ Quizzes/ Group Discussion (2 X 10)	:20
Case study / Mini project (1 X 25)	:25
Seminar/ Presentation (2 X 10)	:20
Attendance	:05
Total	**:100**

Course Objectives:

1. To understand basics concepts of planning of power system and Demand/ Energy forecasting
2. To understand Generating System capability Planning
3. To familiarize students with Power System expansion planning
4. To understand Design of Distribution Systems

Course Outcomes:

After the completion of the course, the students will be able to:

1. Assess the generation adequacy in power system using probabilistic approach
2. Analyze the configuration of substations
3. Evaluate the peak demand and energy requirements of system using forecasting techniques.
4. Develop the solution methodology for optimizing the cost of power system under operation.

Unit - I

Introduction: Power system planning, Objective, Stages in planning and design, load forecasting, Transition from planning to operation.

Unit - II

Generating System capability Planning: Probabilistic models of generating units, Growth rate, Rate of generation capacity, Outage performance and system evaluation of loss of load and loss of energy indices, Power supply availability assessment.

Unit - III

Power System expansion planning: Formulation of least cost optimization problem involving capital, Operation and maintenance costs of candidate units of different types.

Unit - IV

Design of Distribution Systems: Introduction, Optimal conductor selection, Capacitor placement, Reconfiguration, Substation planning, distributed generation.

References:

1. A.S. Pabla, (2008), Electric Power Distribution, Tata McGrawHill.
2. R.Sullivan, (1977), Power System Planning, McGraw Hill
3. U.G. Knight,(1972), Power System Engineering and Mathematics, Pergamon Press (1972).

Name of the Program	Ph.D. Course work in Electrical Engineering	**Program Code**	EEPH
Name of the Course	Optimal operation in power distribution systems	**Course Code**	23EEEPH11C3
Hours/Week	4	**Credits**	4

Note: The formative assessment criteria for this course is as follows:

Written test (2 X 15)	:30
MCQs/ Quizzes/ Group Discussion (2 X 10)	:20
Case study / Mini project (1 X 25)	:25
Seminar/ Presentation (2 X 10)	:20
Attendance	:05
Total	**:100**

Course Objectives:

1. To understand basics concepts of power system and its connection.
2. To understand problem formulation for reconfiguration and its constraints.
3. To familiarize students with power system reliability and its indices.
4. To understand powersystems optimization techniques.

Course Outcomes:

After the completion of the course, the students will be able to:

1. Ability to formulate problem having single objective in distribution system.
2. Analyze the configuration of distribution system with unbalanced RDS.
3. Evaluate the power loss, voltage and reliability indices.
4. Develop the solution methodology for optimizing the power system under optimal operation.

Unit - I

Introduction: need for load forecasting, electrical power distribution system, type of construction, scheme of connection, ring main distribution system, radial distribution system, Interconnected System

Load flow analysis: radial, ring main and interconnected distribution system, unbalanced load flow analysis in radial distribution system, problem formulation, weather sensitive unbalanced load flow analysis in radial distribution system.

Unit - II

Reconfiguration:Optimal reconfiguration with minimization of total power loss, new voltage stability index in RDS, problem formulation, Constraints.

Unit - III

Reliability of Engineering Systems:

System average interruption frequency index (SAIFI), System average interruption duration index (SAIDI),Energy not supplied (ENS),Average energy not supplied

(AENS),Average service availability index (ASAI),Average service unavailability index (ASAI).

Unit - IV

Power system optimization technique:

Basic concept of technique: Genetic algorithm (GA), Artificial Neural Network (ANN) based method, Ant colony optimization (ACO), Particle swarm optimization (PSO) and Bat algorithm (BA).

References:

1. 1. J. Endreny, Reliability Modeling in Electric Power Systems, John Wiley & Sons.
2. Roy Billinton& Ronald, N allan, Reliability Evaluation of Power Systems, Plenum Press, New York.
3. A.S. Pabla, (2008), Electric Power Distribution, Tata McGrawHill.
4. D.P. Kothari and J.S Dhillon, Power system optimization, PHI, 2nd Edition.
5. James Kennedy and Russell Eberrhart, "Particle swarm optimization"Proceedings of ICNN'95 - International Conference on Neural Networks, 1995.
6. Kalyanmoy Deb, Optimization for Engineering design: Algorithm and Examples,PHI.

Name of the Program	Ph.D. Course work in Electrical Engineering	**Program Code**	EEPH
Name of the Course	Power Distribution System	**Course Code**	23EEPH11C4
Hours/Week	4	**Credits**	4

Note: The formative assessment criteria for this course is as follows:

Written test (2 X 15)	:30
MCQs/ Quizzes/ Group Discussion (2 X 10)	:20
Case study / Mini project (1 X 25)	:25
Seminar/ Presentation (2 X 10)	:20
Attendance	:05
Total	**:100**

Course Objectives:

1. To provide students with understand different types of power distributions systems and their usage in today's life.
2. To familiarize students with protection and coordination of protective devices in distribution systems.
3. To understand students how power factor can be improved and need for its improvement.
4. To provide information on voltage control and how to achieve it.
5. To provide information on faults in power system and how to protect the system.

Course Outcomes:

1. Know different types of distributions systems and their design
2. Usage of protective devices and their installation with coordination.
3. An in-depth knowledge of power factor and voltage control in Distribution systems
4. Ability to discuss design considerations of feeders
5. Ability to express voltage control using series capacitors, AVB,AVR etc.

Unit - I

Review: Steady-state circuit analysis, Phasor, Load and load factor, Three phase circuits, Powers

Utility Distribution System: Utility industry, Utility distribution system, Useful definitions.

Unit - II

Transformers and Regulators: Equivalent circuit, Types, System analysis with per unit system, Regulators.

Unit - III

Application of Capacitors for Distribution Systems: Voltage drop, Voltage regulation, Power factor correction, Voltage improvement.

Unit - IV

Faults and Protection in Power System: Types, Fault calculations, Protection.

Cogeneration: Definition, Types, Examples.

References:

1. James Burke &Deksen (1994), Power Distribution Engineering.

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2.L M Faulken Berry and W. Coffer(1996) Electrical Power Distribution and Transmission, PHI
3.H. Lee Willis (2004), Power Distribution Planning Reference Book, Second Edition, CRC Press
4.J.J. Shea,(2005), DOI: 10.1109/MEI.2005.1389282, Electric Power Distribution Handbook [Book Review]
5.TuranGonen (2008), Electric Power Distribution system Engineering 2nd/ed, CRC Press

Name of the Program	Ph.D. Course work in Electrical Engineering	**Program Code**	EEPH
Name of the Course	Intelligent controllers	**Course Code**	23EEEPH11C5
Hours/Week	4	**Credits**	4

Note: The formative assessment criteria for this course is as follows:

Written test (2 X 15)	:30
MCQs/ Quizzes/ Group Discussion (2 X 10)	:20
Case study / Mini project (1 X 25)	:25
Seminar/ Presentation (2 X 10)	:20
Attendance	:05
Total	**:100**

Course Objectives:

1. To provide biological motivation to design intelligent systems and control.
2. To familiarize students with protection and coordination of protective devices in distribution systems.
3. To understand the computer simulation of intelligent control systems to evaluate the performance.
4. To provide Exposure to many real world control problems.

Course Outcomes:

Upon the completion of this course, the student will be able to

1. Develop Neural Networks, Fuzzy Logic, and Genetic algorithms.
2. Implement soft computing to solve real-world problems mainly pertaining to control system applications.
3. Students will be aware of current research trends and issues.
4. Learning analytical approaches to study properties and use of the computer for simulation and evaluation.

Unit - I

Neural Networks – biological neurons – Artificial neurons – activation function – learning rules – feed forward networks – supervised learning –perceptron networks back propagation networks – learning factors – linear separability – Hopfield networks.

Recurrent auto association memory – bi-directional associative memory –temporal – self – organising feature maps – adaptive resonance theory. Network –radial basis function networks.

Unit - II

Genetic Algorithms: Working principles – terminology – Importance of mutation – comparison with traditional methods – constraints and penalty function – GA operators – Real

coded GAS.

Unit - III

Fuzzy set - Crisp set – vagueness – uncertainty and imprecision – fuzzy set – fuzzy operation-properties – crisp versus fuzzy relations – fuzzy relation – cardinality operations, properties – fuzzy Cartesian product and composition – composition of fuzzy relations

Unit - IV

Fuzzy to crisp conversion – Lambda cuts for fuzzy sets and relations –definition methods – structure of fuzzy logic controller – database – rule base – Inference engine

Applications of Neural network and Fuzzy system for power system application. Designing using Simulation Software Fuzzy Logic Toolbox – Use of fuzzy logic, and Neural Network tool box for power system application.

REFERENCE BOOKS

1. Lawrence Fausatt, “Fundamentals of neural networks”, Prentice Hall of India, New Delhi, 1994.24
2. Timothy J. Ross, “Fuzzy Logic with Engineering Applications”, McGraw Hill International Edition, USA, 1997.
3. Bart kosko, “ Neural Networks and Fuzzy Systems”, Prentice Hall of India, New Delhi, 1994.
4. Jack M.Zurada, “Introduction to Artificial Neural Systems”, Jaico publishing house 2006.
5. Zimmerman H.J. “Fuzzy set theory – and its applications”, Kluwer Academic Publishers 1994.
6. Simon Haykin, “Neural Networks – A comprehensive foundation”, Pearson Education Asia, 2002.
7. Kalyanmoy Deb, a optimization for engineering design, prentice hall of India 1988.
8. A.Goldberg, “Genetic Algorithms”

Name of the Program	Ph.D. Course work in Electrical Engineering	**Program Code**	EEPH
Name of the Course	**POWER SYSTEM PROTECTION**	**Course Code**	23EEEPH11C6
Hours/Week	4	**Credits**	4

Note: The formative assessment criteria for this course is as follows:

Written test (2 X 15)	:30
MCQs/ Quizzes/ Group Discussion (2 X 10)	:20
Case study / Mini project (1 X 25)	:25
Seminar/ Presentation (2 X 10)	:20
Attendance	:05
Total	**:100**

Course Objectives:

1. Describe role of main, back up and redundant relay protection scheme
2. Identify zones of protection for a given substation or system
3. Model power system equipment in fault programs
4. Set relays for Power transformer protection
5. Select proper protection functions for the protection of generators and motor

Course Outcomes:

1. Upon completing course student understands different protection schemes adopted in power system.
2. Upon completing course student understands operation of various switchgear equipment.
3. Upon completing course student understands protection of different electrical equipments.

Unit - I

Review of basic protection – Static relays – advantages – Basic construction – characteristics of protective relays – Phase & amplitude comparators – Over current relays – different types of time – Over current relays – differentialprotection scheme.

Unit - II

Transmission line protection – fault clearing times – Types of distance relays – Evaluation of distance relay performance during swings– automatic re-closing – Three-zone protection.

Unit - III

Transmission line protection – fault clearing times – Types of distance relays – Evaluation of distance relay performance during swings– automatic re-closing – Three-zone protection.

Unit - IV

Microprocessor based protective relays – Development of Computer relaying –Benefits of computer relaying – Computer relay architecture - analysis and simulation of

15

protection systems.

References:

1. MadhavaRao.T.S, “Power System protection :Static relay with Microprocessor applications”, Tata McGraw Hill, 1989.10
2. Ram.B, Viswakarma.D.N, “Power System Protection and Switch Gear”, Tata McGraw Hill, 1995.
3. Ram.B, “Fundamentals of Microprocessors and Microcomputers” DhanpatRai& Sons, 1985.
4. Kundur.P, “Power System Stability and Control”, Tata McGraw Hill, 1994.

Annexure AC/6.9

~~Annexure A6~~

Maharshi Dayanand University, Rohtak

(A State University Established Under Haryana Act No. XXV of 1975)
A+ Grade University Accredited by NAAC

No. ACS-I/II/III/2026/ 16320-363
Dated : 30/6/2026

To

1. All the HoDs/ Directors of UTDs/Institutes/Centers,M.D. University, Rohtak
2. Director, MDU-CPAS, Gurugram

Sub:- Amendment in Assessment Mechanism of various Programs under NEP-2020.

Sir/Madam,

In terms of orders passed by competent Authority, following is brought to your notice for further necessary action :-

1. The Formative Assessment Mechanism of UG, PG, PG Diploma, Ph.D Programs and Certificate Courses is rolled back to the previous system of Term End Examinations Mechanism comprising Internal Assessment (30%) and Term End Examinations (70%) except in case of Multidisciplinary and Value Added Courses in UG Programs 2026-27.
2. The aforesaid amendment made in the Formative Assessment shall be implemented in all semesters of UG, PG, PG Diploma, Ph.D Programs and Certificate Courses under NEP-2020 w.e.f. the session 2026-27 including the students admitted in the academic session 2025-26.
3. The reappear cases in Formative Assessment of students admitted in 2025-26, if any, will be allowed for assessment in the same pattern in which he/she appeared in previous semester. For this propose, each such student will have to submit the reappear form as per examination rules.

In light of aforementioned directions, the HoDs/Directors of UTDs/Centres/Institutes are requested to undertake necessary steps for amendments/ updation of Scheme of Examination (SOE) and Syllabi of related UG, PG, PG Diploma, Ph.D. Programs and Certificate Courses.The revised/updated Scheme of Examination (SOE) and Syllabi must be supplied within 15 days from the date of issuing this letter.

This may be treated as most urgent so that the amended/updated SOE/Syllabi are uploaded on the University Website well in time before start of the next Academic Session 2026–27.

30/6/26

Assistant Registrar (Academic)
for REGISTRAR

Endst. No. ACS-I/II/III/2026/ 16264-564 **Dated:** 30/6/2026

Copy of the above is forwarded to the following for information and necessary action :-

1. Deans of Faculties, M.D. University, Rohtak
2. Director, MDU-CPAS, Gurugram
3. Director, CCDD, M.D. University Rohtak
4. Controller of Examinations, M.D. University, Rohtak
5. Director, IQAC, M.D. University, Rohtak
6. Director, University Computer Centre, M.D. University, Rohtak
7. All Principals/Directors of the Colleges/Institutes affiliated to M.D. University, Rohtak
8. Deputy/Assistant Registrar (Secrecy/Conduct/Result-I,II,III,IV), M.D. University, Rohtak.
9. OSD/PA to the Vice-Chancellor/Dean Academic Affairs/Registrar (for kind information to the Vice-Chancellor/Dean Academic Affairs/Registrar) M.D. University, Rohtak.

30/6/26

Assistant Registrar (Academic)
for REGISTRAR

UNIVERSITYINSTITUTEOFENGINEERING&TECHNOLOGY MAHARSHI DAYANAND UNIVERSITY, ROHTAK

SCHEMEOFSTUDIES&EXAMINATIONS

Doctor of Philosophy (Ph.D.) Course Work

Electronic and communication engineering

Scheme of Examination w.e.f. 2025-26

Program Specific Outcomes (PSOs)

Upon successful completion of the Ph.D. (Electronic and communication engineering) Course Work programme, the students will be able to:

PSO1: Formulate a well-defined and feasible research proposal, select appropriate research methodologies, and critically justify and defend the chosen methodology.

PSO2: Demonstrate a clear understanding of the various stages and tasks involved in conducting independent and systematic research.

PSO3: Identify, access, and utilize appropriate scholarly resources, tools, and technologies required to effectively carry out the research process.

PSO4: Document research work systematically and present findings clearly and coherently in the candidate's chosen research area.

PSO5: Acquire in-depth knowledge of advanced and emerging research trends in the candidate's specialization within the field of Electronic and communication engineering.

Duration: One Semester (Six months)

Total Credits: 12 credits

Sr. No.	Course No.	Course Title	Credits	Marks	Hours per week
1	23ECEPCC1	Research Methodology (Quantitative Techniques and Computer Applications in Research)	4	100	4
2	23CCPH11C1	Research and Publication Ethics	2	50	2
3	23ECEPCC2	Review of Literature and Seminar (in Relevant Research Area)	2	50	2
4		Departmental – Elective Course (in Relevant Research Area) any one from the list attached	4	100	4
	Total		**12**	**300**	**12**

The formative assessment as under, will be applicable for the assessment:

Marks distribution (For Four four-credit theory course)	**Marks**
Written test (2 X 15)	30
MCQs/ Quizzes/ Group Discussion (2 X 10)	20
Case study / Mini project (1 X 25)	25
Seminar / Presentation (2 X 10)	20
Attendance	05
Total	100

Marks distribution (For Two Credit Theory Course)	**Marks**
Written test (2 X 5)	10
Peer discussion / Debate / Extempore speech (2X 10)	20
Role play	05
Essay / Article / Report writing	10
Attendance	05
Total	50

Program Name	**Ph.D.[ECE] UIET**	**Program Code**	
Course Name	Research Methodology (Quantitative Techniques and Computer Applications in Research)	**Course Code**	23ECEPCC1
Credits	4	**No. of hours/Week**	4

Objectives and Outcomes of this course paper

Learning Objectives:

1. To understand the fundamentals concepts of research process, various models of research and report writing concepts.
2. To learn various statistical analysis techniques for data analysis and hypothesis testing.
3. To understand the concepts of measurement and scaling & their various techniques and sample size determination.
4. To learn various types of data collection techniques, types of data, analysis and interpretation of data.
5. To understand the role of computer in mathematical and statistical analysis in research and to get the idea about applications of relevant research methodologies with special reference to research in computer science.

Learning Outcomes:

By the end of the course the students will be able to:

1. Learn the concept of research, research process, types of research, research models and basics formats of report writing.

2. Learn the use of statistical analytic techniques for data analysis and testing of hypothesis.
3. Identify thedifferencesbetweenmeasurementandscalingandhowsampleisselected and determined using various approaches.
4. To understand sources of data collection and how data is collected from different sources.
5. To understand the concept of interpretation and role of computer in mathematical and Statisticalanalysiswithapplicationsofrelevantresearchmethodologiesusedincomputer science& Engineering.

UNIT I

Element of Research: Scientific process meaning and definition, a brief history of scientific process. Introduction to research methodology- Meaning of research, objective of research, types of research, significance of research, problem encountered by researchers in India, Research problem- Definition, necessity and techniques of defining research problem, formulation of research problem, objective of research problem, research design-Meaning, need and features of good research design, types of research designs, basic principles of Experimental design. Sampling design census and sample surveys, different types of sample designs, characteristics of good sample design, Techniques of selecting a random sample. Data collection-primary and secondary data, methods of selecting primary and secondary data.

UNIT II

Hypothesis & Statistical Analysis: Hypothesis- definition, testing of hypothesis, procedures of hypothesis testing, flow diagram for hypothesis testing, parametric and non-parametric tests for testing of hypothesis, limitations of tests of hypothesis. Hypothesis tests-One sample test-two sample tests/ chi square tests, association of attributes. T-tests, statistical analysis, correlation and regression analysis- analysis of variance, completely randomized design, randomized complete block design, Latin square design-partial and multiple correlations– discriminant analysis - cluster analysis – principle component and factor analysis, repeated measure analysis. Probability and probability distributions; Binomial, Poisson, distribution, Basic ideas of testing of hypotheses; Tests of significance based on normal distributions.

UNIT III

Paper Writing and Report Generation: Basic concepts of paper writing and report generation, review of literature, concepts of bibliography and references, significance of report writing, steps of report writing, types of research reports, methods of presentation of report.

UNIT IV

Computer Applications in Research: Computer Applications: Fundamentals of computers-Definition, types of computers, RAM, ROM, CPU, I/O devices, Number systems-Binary, octal and hexadecimal, base conversion, logic gates- AND, OR, NOT, Operating system- definition, types of operating system, Database system – definition & applications, Networks – definition & applications, Internet & its applications, Web Searching, Email, Uses of software's MS-Office-Power Point, Word, Excel and Access.

TextBooks:

1. C.R.Kothari–Research Methodology Methods and Techniques– WishwaPrakashan Publishers – Second Edition.

RESEARCH AND PUBLICATION ETHICS

(23CCPH11C1)

(Compulsory for all Ph.D. Course Work)

Syllabus of Research and Publication Ethics shall be provided by Chaudhary Ranbir Singh Institute of Social and Economic Change**.**

SYLLABUS (Ph.D. Course ECE) **Annexure -1**

List of Electives:

1	23ECEPCD1	Advanced Data Communications
2	23ECEPCD2	Advanced Digital Signal processing
3	23ECEPCD3	Microcontrollers for Embedded system Design
4	23ECEPCD4	Telecommunication Switching & Networks
5	23ECEPCD5	VLSI Technology and Design
6	23ECEPCD6	Adhoc Wireless & Sensor Networks
7	23ECEPCD7	Mobile Computing Technologies
8	23ECEPCD8	Optical Communications Technology
9	23ECEPCD9	Wireless Communications & Networks
10	23ECEPCD10	Global Positioning Systems
11	23ECEPCD11	Microwave Antennas
12	23ECEPCD12	Image & Video Processing

Note: The departmental elective subjects will be offered as per availability of expertise and the required infrastructure in the department.

Name of the Program	**Ph.D. Course work (ECE) UIET**	**Program Code**	
Name of the Course	Research Methodology (Quantitative Techniques and Computer Applications in Research)	**Course Code**	23ECEPCC1
Hours/Week	4	**Credits**	4

Course Objectives:

1. To understand the fundamentals concepts of research process, various models of research and report writing concepts.
2. To learn various statistical analysis techniques for data analysis and hypothesis testing.
3. To understand the concepts of measurement and scaling & their various techniques and sample size determination.
4. To learn various types of data collection techniques, types of data, analysis and interpretation of data.
5. To understand the role of computer in mathematical and statistical analysis in research and to get the idea about applications of relevant research methodologies with special reference to research in computer science.

Course Outcomes:

1. Learn the concept of research, research process, types of research, research models and basics formats of report writing.
2. Learn the use of statistical analytic techniques for data analysis and testing of hypothesis.
3. Identify the differences between measurement and scaling and how sample is selected and determined using various approaches.
4. To understand sources of data collection and how data is collected from different sources.
5. To understand the concept of interpretation and role of computer in mathematical and Statistical analysis with applications of relevant research methodologies used in computer science &Engineering.

Unit - I

Element of Research

Scientific process meaning and definition, a brief history of scientific process. Introduction to research methodology- Meaning of research, objective of research, types of research, significance of research, problem encountered by researchers in india, Research problem- Definition, necessity and techniques of defining research problem, formulation of research problem, objective of research problem, research design- Meaning, need and features of good research design, types of research designs, basic principles of Experimental design.Sampling design, census and sample surveys, different types of sample designs, characteristics of good sample design, Techniques of selecting a random sample. Data collection- primary and secondary data, methods of selecting primary and secondary data.

Unit - II

Hypothesis &Statistical Analysis

Hypothesis- definition, testing of hypothesis, procedures of hypothesis testing, flow diagram for hypothesis testing, parametric and non-parametric tests for testing of hypothesis, limitations of tests of hypothesis. Hypothesis tests- One sample test-two sample tests/ chi square tests, association of attributes. T-tests, statistical analysis, correlation and regression analysis- analysis of variance, completely randomized design, randomized complete block design, Latin square design-partial and multiple correlations – discriminate analysis - cluster analysis – principle component and factor analysis, repeated measure analysis. Probability and probability distributions; Binomial, Poisson, distribution,
Basic ideas of testing of hypotheses; Tests of significance based on normal distributions.

Unit - III

Paper Writing and Report Generation

Basic concepts of paper writing and report generation, review of literature, concepts of bibliography and references, significance of report writing, steps of report writing, types of research reports, methods of presentation of report.

Unit - IV

Computer Applications in Research

Computer Applications: Fundamentals of computers-Definition, types of computers, RAM, ROM, CPU, I/O devices, Number systems-Binary, octal and hexadecimal, base conversion, logic gates- AND, OR, NOT, Operating system-definition, types of operating system, Database system – definition & applications, Networks – definition & applications, Internet & its applications, Web Searching, Email, Uses of software's MS- Office-Power Point, Word, Excel
and Access.

Text Books:

1. C. R. Kothari – Research Methodology Methods and Techniques – Wishwa Prakashan Publishers – Second Edition.

Name of the Program	**Ph.D. Course work (ECE) UIET**	**Program Code**	
Name of the Course	Research and Publication ethics	**Course Code**	23ECEPCC3
Hours/Week	2	**Credits**	2

Course Objectives:

1. To study the philosophy of ethics
2. To study the scientific conduct of research
3. To study the publication ethics
4. To know about various journal citation databases
5. To know the importance of quality publications

Course Outcomes:

By completion of course the student is able to understand

1. Ethics in conduct of scientific research
2. Know the scientific misconducts
3. How to avoid plagiarism and what are the penalties of plagiarism
4. Know the quality of research publications
5. Write research and review articles.

Unit - I

PHILOSOPHY AND ETHICS

1. Introduction to philosophy: definition, nature and scope, concept, branches
2. Ethics: definition, moral philosophy, nature of moral judgments and reactions

SCIENTIFIC CONDUCT

1. Ethics with respect to science and research
2. Intellectual honesty and research integrity
3. Scientific misconducts: Falsification, Fabrication, and Plagiarism(FFP)
4. Redundant publications: duplicate and overlapping publications, salami slicing
5. Selective reporting and misrepresentation of data

Unit - II

PUBLICATION ETHICS

1. Publication ethics: definition, introduction andimportance
2. Best practices / standards setting initiatives and guidelines: COPE, WAME,etc.
3. Conflicts ofinterest
4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa,types
5. Violation of publication ethics, authorship and contributorship
6. Identification of publication misconduct, complaints andappeals
7. Predatory publishers andjournals

Unit - III

DATABASES AND RESEARCH METRICS

(A) Databases

1. Indexing databases
2. Citation databases: Web of Science, Scopus,etc.

(B) Research Metrics

1. Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score
2. Metrics: h-index, g index, i10 index,altmetrics

Unit - IV

Practice

OPEN ACCESS PUBLISHING

1. Open access publications and initiatives
2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies
3. Software tool to identify predatory publications developed by SPPU
4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested,etc.

PUBLICATION MISCONDUCT

(A) Group Discussions

1. Subject specific ethical issues, FFP, authorship
2. Conflicts of interest
3. Complaints and appeals: examples and fraud from India and abroad

(B) Software tools (2 hrs.) :Use of plagiarism software like Tumitin, Urkund and other open source software tools

References:

1. Bird, A. (2006). Philosophy of Science,Routledge
2. P. Chaddah (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarised.
3. Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance(2019).
4. Beall, J (2012), Predatory publishers are corrupting open access. Nature, 489(7415), 179.
5. National Academy of Sciences, National Academy of Engineering and Institute of Medicine (2009). On being a Scientist: A guide to Responsible Conduct in Research, Third Edition, national Academicpress.

Name of the Program	**Ph.D. Course work (ECE) UIET**	**Program Code**	
Name of the Course	Review of Literature and Seminar (in Relevant Research Area)	**Course Code**	23ECEPCC2
Hours/Week	2	**Credits**	2

1. The research student is required to prepare a concept paper/working, paper/review paper by reviewing at least 50 research papers / references books / unpublished doctoral dissertations / other reports etc.

2. To qualify the paper the research student is required either to present the prepared paper in a International Conference/ Seminar/ Workshop or published the same in a research journal. Acceptance for publication or presentation will be considered as published/presented.

3. A duly constituted committee of three teachers of the department by the Director/Head shall evaluate the completion of the paper.

SYLLABUS (Ph.D. Course work ECE)

Name of the Program	**Ph.D. Course work (ECE) UIET**	**Program Code**	
Name of the Course	Advanced Data Communications	**Course Code**	23ECEPCD1
Hours/Week	4	**Credits**	4

Unit-I:

Digital Modulation: Introduction, Information Capacity Bits, Bit Rate, Baud, and M-ARYCoding, ASK, FSK, PSK, QAM, BPSK, QPSK, 8PSK, 16PSK, 8QAM, 16QAM, DPSK Methods, Band Width Efficiency, Carrier Recovery, Clock Recovery.

Unit -II:

Basic Concepts of Data Communications, Interfaces and Modems: Data Communication-Components, Networks, Distributed Processing, Network Criteria- Applications, Protocols and Standards, Standards Organizations- Regulatory Agencies, Line Configuration- Point-to-point-Multipoint, Topology- Mesh- Star- Tree- Bus- Ring- Hybrid Topologies, Transmission Modes-Simplex- Half duplex- Full Duplex, Categories of Networks- LAN, MAN, WAN and Internetworking, Digital Data Transmission- Parallel and Serial, DTE- DCE Interface- Data Terminal Equipment, Data Circuit- Terminating Equipment, Standards EIA 232 Interface, Other Interface Standards, Modems-Transmission Rates.

Unit-III:

ErrorDetectionandCorrection: Types of Errors-Single-BitError,CRC(CyclicRedundancy Check)-Performance, Checksum, Error Correction- Single-Bit Error Correction, Hamming Code.

Data link Control: Stop and Wait, Sliding Window Protocols.

Data Link Protocols: Asynchronous Protocols, Synchronous Protocols, Character Oriented Protocol-Binary Synchronous Communication (BSC) - BSC Frames- Data Transparency, Bit Oriented Protocols – HDLC, Link Access Protocols.

Unit-IV:

Switching: Circuit Switching- Space Division Switches- Time Division Switches- TDM Bus- Space and Time Division Switching Combinations- Public Switched Telephone Network, Packet Switching-Datagram Approach- Virtual Circuit Approach- Circuit Switched Connection Versus Virtual Circuit Connection, Message Switching.

Multiplexing: Time Division Multiplexing (TDM), Synchronous Time Division Multiplexing, Digital Hierarchy, Statistical Time Division Multiplexing.

Multiple Access: Random Access, Aloha- Carrier Sense Multiple Access (CSMA)- Carrier Sense Multiple Access with Collision Detection (CSMA)- Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA), Controlled Access- Reservation- Polling- Token Passing, Channelization-Frequency- Division Multiple Access (FDMA), Time - Division Multiple Access (TDMA), - Code - Division Multiple Access (CDMA).

TEXT BOOKS:

1. Data Communication and Computer Networking - B. A.Forouzan, 3rd ed., 2008,TMH.
2. Advanced Electronic Communication Systems - W. Tomasi, 5 ed., 2008,PEI.

REFERENCES:

1. Data Communications and Computer Networks - Prakash C. Gupta, 2006,PHI.
2. Data and Computer Communications - William Stallings, 8thed., 2007,PHI.
3. Data Communication and Tele Processing Systems - T. Housely, 2nd Edition, 2008,BSP.
4. Data Communications and Computer Networks- BrijendraSingh, 2nd ed., 2005,PHI.
5. Telecommunication System Engineering – Roger L. Freeman, 4/ed., Wiley-Interscience, John Wiley & Sons,2004.

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	Advanced Digital Signal Processing	**Course Code**	23ECEPCD2
Hours/Week	4	**Credits**	4

UNIT I

Review of DFT, FFT, IIR Filters, FIR Filters,

Multirate Signal Processing: Introduction, Decimation by a factor D, Interpolation by a factor I, Sampling rate conversion by a rational factor I/D, Multistage Implementation of Sampling Rate Conversion, Filter design & Implementation for sampling rate conversion, Applications of Multirate Signal Processing

UNIT II

Non-Parametric methods of Power Spectral Estimation: Estimation of spectra from finite duration observation of signals, Non-parametric Methods: Bartlett, Welch & Blackman & Tukey methods, Comparison of all Non-Parametric methods

UNIT III

Parametric Methods of Power Spectrum Estimation: Autocorrelation & Its Properties, Relation between auto correlation &model parameters, AR Models - Yule-Waker& Burg Methods, MA & ARMA models for power spectrum estimation.

UNIT –IV

Linear Prediction : Forward and Backward Linear Prediction – Forward Linear Prediction, Backward Linear Prediction, Optimum reflection coefficients for the Lattice Forward and Backward Predictors. Solution of the Normal Equations: Levinson Durbin Algorithm, Schur Algorithm. Properties of Linear Prediction Filters

Finite Word Length Effects: Analysis of finite word length effects in Fixed-point DSP systems – Fixed, Floating Point Arithmetic

TEXTBOOKS:

1. DigitalSignalProcessing:Principles,Algorithms&Applications-J.G.Proakis&D.G.Manolokis, 4_{th} ed.,PHI.
2. Discrete Time signal processing - Alan V Oppenheim & RonaldW Schaffer, PHI.
3. DSP– APraticalApproach–EmmanuelC.Ifeacher,Barrie.W.Jervis,2ed.,Pearson Education.

REFERENCES:

1. Modern spectral Estimation : Theory & Application – S. M .Kay, 1988,PHI.
2. MultirateSystems and Filter Banks – P.P.Vaidyanathan – PearsonEducation
3. Digital Signal Processing – S.Salivahanan, A.Vallavaraj, C.Gnanapriya,2000,TMH

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	Microcontrollers for Embedded system Design	**Course Code**	23ECEPCD3
Hours/Week	4	**Credits**	4

Unit – I:

Introduction to Embedded Systems

Overview of Embedded Systems, Processor Embedded into a system, Embedded Hardware Units and Devices in system, Embedded Software, Complex System Design, Design Process in Embedded System, Formalization of System Design, Classification of Embedded Systems.

Unit – II:

Microcontrollers and Processor Architecture & Interfacing

8051 Architecture, Input/Output Ports and Circuits, External Memory, Counters and Timers, PIC Controllers. Interfacing Processor (8051, PIC), Memory Interfacing, I/O Devices, Memory Controller and Memory arbitration Schemes.

Unit – III:

Embedded RISC Processors & Embedded System-on Chip Processor

PSOC (Programmable System-on-Chip) architectures, Continuous Timer blocks, Switched Capacitor blocks, I/O blocks, Digital blocks, Programming of PSOC, Embedded RISC Processor architecture – ARM Processor architecture, Register Set, Modes of operation and overview of Instructions

Unit – IV:

Interrupts & Device Drivers

Exceptions and Interrupt handling Schemes – Context & Periods for Context Switching, Deadline & interrupt latency. Device driver using Interrupt Service Routine, Serial port Device Driver, Device drivers for Internal Programmable timing devices

Network Protocols

Serial communication protocols, Ethernet Protocol, SDMA, Channel & IDMA, External Bus Interface

TEXT BOOKS:

1. Embedded Systems - Architecture Programming and Design – Raj Kamal, 2nd ed.,2008,TMH.
2. PICMicrocontrollerandEmbeddedSystems–MuhammadAliMazidi,RolinD.Mckinaly, Danny Causy –PE.
3. Designers Guide to the Cypress PSOC – Robert Ashpy, 2005,Elsevier.

REFERENCES:

1. Embedded Microcomputer Systems, Real Time Interfacing – Jonathan W. Valvano –Brookes / Cole, 1999, Thomas Learning.
2. ARM Systems Developers Guides- Design & Optimizing System Software - AndrewN. Sloss, Dominic Symes, Chris Wright, 2004,Elsevier.
3. Designing with PIC Microcontrollers- John B. Peatman, 1998, PHInc.

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	Telecommunication Switching & Networks	Course Code	23ECEPCD4
Hours/Week	4	Credits	4

UNIT I:

Introduction: Evolution of Telecommunications, Simple Telephone Communication, Basics of Switching System, Manual Switching System, Major Telecommunication Networks.

Crossbar Switching: Principles of Common Control, Touch Tone Dial Telephone, Principles of Crossbar Switching, Crossbar Switch Configurations, Cross point Technology, Crossbar Exchange Organization.

UNIT II:

ElectronicSpaceDivisionSwitching:StoredProgramControl,CentralizedSPC, Distributed SPC,SoftwareArchitecture,ApplicationSoftware,EnhancedServices,Two-StageNetworks, Three-Stage Networks, n- StageNetworks.

Time Division Switching: Basic Time Division Space Switching, Basic Time Division Time Switching, Time Multiplexed Space Switching, Time Multiplexed Time Switching, CombinationSwitching,Three-StageCombinationSwitching,n-StageCombinationSwitching.

UNIT III:

Telephone Networks: Subscriber Loop System, Switching Hierarchyand Routing, Transmission Plan, Transmission Systems, Numbering Plan, Charging Plan, Signaling Techniques, In-channel Signaling, Common Channel Signaling, Cellular MobileTelephony

Signaling: Customer Line Signaling, Audio- Frequency Junctions and Trunk Circuits, FDM Carrier Systems, PCM Signaling, Inter- Register Signaling, Common- Channel Signaling Principles, CCITT Signaling System no.6, CCITT Signaling System no.7,Digital Customer Line Signaling.

Packet Switching: Statistical Multiplexing, Local- Area and Wide- Area Networks, Large-scale Networks, Broadband Networks.

UNIT IV:

Switching Networks: Single- Stage Networks, Gradings, Link Systems, Grades of service of link systems, Application of Graph Theory to link Systems, Use of Expansion, Call Packing, Rearrangeable Networks, Strict- Sense non-blocking Networks, Sectionalized Switching Networks

Telecommunications Traffic: The Unit of Traffic, Congestion, Traffic Measurement, A Mathematical Model, Lost-call Systems, Queuing Systems.

Integrated Services Digital Network: Motivation for ISDN, New Services, Network and Protocol Architecture, Transmission Channels, User- Network Interfaces, Signaling, Numbering and Addressing, Service Characterization, Interworking, ISDN Standards, Expert Systems in ISDN, Broadband ISDN, Voice Data Integration.

TEXT BOOKS:

1. TelecommunicationSwitchingSystemsandNetworks-ThiagarajanViswanathan,2000,PHI.
2. TelecommunicationsSwitching,TrafficandNetworks-J.E.Flood,2006,PearsonEducation.

REFERENCES:

1. Digital Telephony- J. Bellamy, 2_{nd} Edition, 2001, JohnWiley.
2. Data Communications and Networks- Achyut S. Godbole, 2004,TMH.
3. Principles of Communication Ststems- H. Taub& D. Schilling, 2_{nd}Edition, 2003, TMH.
4. Data Communication & Networking- B. A. Forouzan, 3_{rd} Edition, 2004,TMH.
5. Telecommunication System Engineering – Roger L. Freeman, 4/ed., Wiley-Interscience, John Wiley & Sons,2004.

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	VLSI Technology and Design	**Course Code**	23ECEPCD5
Hours/Week	4	**Credits**	4

UNIT – I:

ReviewofMicroelectronicsandIntroductiontoMOSTechnologies:MOS,CMOS, BiCMOS Technology, Trends And Projections.

Basic Electrical Properties of MOS, CMOS &BiCMOS Circuits: I_{ds}-V_{ds} relationships, Threshold Voltage V_t, G_m, G_{ds} and $\dot{A}_o$, Pass Transistor, MOS, CMOS & Bi CMOS Inverters, Zpu/Zpd, MOS Transistor circuit model, Latch-up in CMOS circuits.

UNIT – II:

LAYOUT DESIGN AND TOOLS: Transistor structures, Wires and Vias, Scalable Design rules, Layout Design tools.

LOGICGATES&LAYOUTS: Static Complementary Gates, Switch Logic, Alternative Gate circuits, Low power gates, Resistive and Inductive interconnect delays.

UNIT – III:

COMBINATIONAL LOGIC NETWORKS: Layouts, Simulation, Network delay, Interconnect design, Power optimization, Switch logic networks, Gate and Network testing.

UNIT –IV:

SEQUENTIAL SYSTEMS: Memory cells and Arrays, Clocking disciplines, Design, Power optimization, Design validation and testing.

FLOOR PLANNING & ARCHITECTURE DESIGN: Floor planning methods, off-chip connections, High-level synthesis, Architecture for low power, SOCs and Embedded CPUs, Architecture testing.

TEXT BOOKS:

1. Essentials of VLSI Circuits and Systems, K. EshraghianEshraghian. D, A.Pucknell, 2005,PHI.

2. Modern VLSI Design - Wayne Wolf, 3rd ed., 1997, PearsonEducation.

REFERENCES:

1. Principals of CMOS VLSI Design – N.H.E Weste, K.Eshraghian, 2_{nd} ed., Adisson Wesley.

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	Adhoc Wireless & Sensor Networks	Course Code	23ECEPCD6
Hours/Week	4	Credits	4

Unit-I:

Wireless LANS and PANS: Introduction, Fundamentals of WLANS, IEEE 802.11 Standard, HIPERLAN Standard, Bluetooth, Home RF.

Wireless Internet: Wireless Internet, Mobile IP, TCP in Wireless Domain, WAP, Optimizing Web Over Wireless.

Unit-II:

AD HOC Wireless Networks: Introduction, Issues in Ad Hoc Wireless Networks, AD Hoc Wireless Internet.

MAC Protocols for Ad Hoc Wireless Networks: Introduction, Issues in Designing a MAC protocol for Ad Hoc Wireless Networks, Design goals of a MAC Protocol for Ad Hoc Wireless Networks, Classifications of MAC Protocols, Contention - Based Protocols, Contention - Based Protocols with reservation Mechanisms, Contention – Based MAC Protocols with Scheduling Mechanisms, MAC Protocols that use Directional Antennas, Other MAC Protocols.

Unit -III:

ROUTING PROTOCOLS: Introduction, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classification of Routing Protocols, Table –Driven Routing Protocols, On – Demand Routing Protocols, Hybrid Routing Protocols, Routing Protocols with Efficient Flooding Mechanisms, Hierarchical Routing Protocols, Power – Aware Routing Protocols.

TRANSPORT LAYER AND SECURITY PROTOCOLS: Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Other Transport Layer Protocol for Ad Hoc Wireless Networks, Security in Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management, Secure Routing in Ad Hoc Wireless Networks.

Unit – IV:

QUALITY OF SERVICE: Introduction, Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks, Classification of QoS Solutions, MAC Layer Solutions, Network Layer Solutions, QoS Frameworks for Ad Hoc Wireless Networks.

ENERGY MANAGEMENT: Introduction, Need for Energy Management in Ad Hoc Wireless Networks, Classification of Ad Hoc Wireless Networks, Battery Management Schemes, Transmission Power Management Schemes, System Power Management Schemes.

WIRELESS SENSOR NETWORKS: Introduction, Sensor Network Architecture, Data Dissemination, Data Gathering, MAC Protocols for Sensor Networks, Location Discovery, Quality of a Sensor Network, Evolving Standards, Other Issues.

TEXT BOOKS:

1. Ad Hoc Wireless Networks: Architectures and Protocols - C. Siva RamMurthy and B.S.Manoj, 2004,PHI.

2. Wireless Ad- hoc and Sensor Networks: Protocols, Performance and Control- JagannathanSarangapani, CRCPress

REFERENCES:

1. Ad- Hoc Mobile Wireless Networks: Protocols &Systems, C.K. Toh ,1ed. Pearson Education.

2. Wireless Sensor Networks - C. S. Raghavendra, Krishna M. Sivalingam, 2004,Springer

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	Mobile Computing Technologies	Course Code	23ECEPCD7
Hours/Week	4	Credits	4

Unit-I

Introduction to Mobile Computing Architecture

Mobile Computing – Dialog Control – Networks – Middleware and Gateways – Application and Services – Developing Mobile Computing Applications – Security in Mobile Computing – Architecture for Mobile Computing – Three Tier Architecture – Design considerations for Mobile Computing – Mobile Computing through Internet – Making existing Applications Mobile Enabled.

CellularTechnologies: GSM, GPS, GPRS, CDMA and 3G

Bluetooth – Radio Frequency Identification – Wireless Broadband – Mobile IP – Internet Protocol Version 6 (IPv6) – Java Card – GSM Architecture – GSM Entities – Call Routing in GSM – PLMN Interfaces – GSM addresses and Identifiers – Network aspects in GSM – Authentication and Security – Mobile computing over SMS – GPRS and Packet Data Network – GPRS Network Architecture – GPRS Network Operations – Data Services in GPRS – Applications for GPRS – Limitations of GPRS – Spread Spectrum technology – Is-95 – CDMA Versus GSM – Wireless Data – Third Generation Networks – Applications on 3G

Unit – II

Wireless Application Protocol (WAP) and Wireless LAN

WAP–MMS–Wireless LANAdvantages–IEEE802.11Standards–Wireless LAN Architecture – Mobility in wirelessLAN

IntelligentNetworksandInterworking

Introduction – Fundamentals of Call processing – Intelligence in the Networks – SS#7 Signaling – IN Conceptual Model (INCM) – softswitch – Programmable Networks – Technologies and Interfaces for IN

Unit – III

Client Programming, Palm OS,Symbian OS, Win CE Architecture

Introduction – Moving beyond the Desktop – A Peek under the Hood: Hardware Overview – Mobile phones – PDA – Design Constraints in Applications for Handheld Devices – Palm OS architecture – Application Development – Multimedia – Symbian OS Architecture – Applications for Symbian, Different flavors of Windows CE -Windows CE Architecture

J2ME JAVA in the Handset – The Three-prong approach to JAVA Everywhere – JAVA 2 Micro Edition (J2ME) technology – Programming for CLDC – GUI in MIDP – UI Design Issues – Multimedia – Record Management System – Communication in MIDP – Security considerations in MIDP – Optional Packages

Unit – IV

Voice over Internet Protocol and Convergence

Voice over IP- H.323 Framework for Voice over IP – Session Initiation Protocol – Comparison between H.323 and SIP – Real Time protocols – Convergence Technologies – Call Routing – Voice over IP Applications – IP multimedia subsystem (IMS) – Mobile VoIP

Security Issues in Mobile Computing

Introduction – Information Security – Security Techniques and Algorithms – Security Protocols – Public Key Infrastructure – Trust – Security Models – Security frameworks for Mobile Environment

TEXT & REFERENCES BOOKS:

1. MobileComputing–Technology,ApplicationsandServiceCreation–
AsokeK Talukder, RoopaR Yavagal, 2009, TATA McGrawHill
2. Mobile Communications – Jochen Schiller – 2nd Edition – PearsonEducation
3. TheCDMA2000SystemforMobileCommunications–
VieriVaughi,AlexanderDamn Jaonvic –Pearson
4. ADALESTEIN : Fundamentals of Mobile & Pervasive Computing, 2008,TMH

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	Optical Communications Technology	**Course Code**	23ECEPCD8
Hours/Week	4	**Credits**	4

Unit – I

Signal propagation in Optical Fibers

Geometrical Optics approach and Wave Theory approach, Loss and Bandwidth, Chromatic Dispersion, Non Linear effects- Stimulated Brillouin and Stimulated Raman Scattering, Propagation in a Non-Linear Medium, Self Phase Modulation and Cross Phase Modulation, Four Wave Mixing, Principle of Solitons.

Unit – II

Fiber Optic Components for Communication & Networking

Couplers, Isolators and Circulators, Multiplexers, Bragg Gratings, Fabry-Perot Filters, Mach Zender Interferometers, Arrayed Waveguide Grating, Tunable Filters, High Channel Count Multiplexer Architectures, Optical Amplifiers, Direct and External Modulation Transmitters, Pump Sources for Amplifiers, Optical Switches and Wavelength Converters.

Unit – III

Modulation and Demodulation

Signal formats for Modulation, Subcarrier Modulation and Multiplexing, Optical Modulations – Duobinary, Single Side Band and Multilevel Schemes, Ideal and Practical receivers for Demodulation, Bit Error Rates, Timing Recovery and Equalization, Reed-Solomon Codes for Error Detection and Correction.

Unit – IV

Transmission System Engineering

System Model, Power Penalty in Transmitter and Receiver, Optical Amplifiers, Crosstalk and Reduction of Crosstalk, Cascaded Filters, Dispersion Limitations and Compensation Techniques.

Fiber Non-linearities and System Design Considerations

Limitation in High Speed and WDM Systems due to Non-linearities in Fibers, Wavelength Stabilization against Temperature Variations, Overall System Design considerations – Fiber Dispersion, Modulation, Non-Linear Effects, Wavelengths, All Optical Networks.

TEXT BOOKS:

1. OpticalNetworks:APracticalPerspective-RajivRamaswamiandKumarN.Sivarajan,2 ed., 2004, Elsevier Morgan Kaufmann Publishers (An Imprint ofElsevier).
2. Optical Fiber Communications – GerdKeiser, 3 ed., 2000, McGrawHill.

REFERENCES:

1. Optical Fiber Communications: Principles and Practice – John.M.Senior, 2 ed., 2000,PE.
2. Fiber Optics Communication – Harold Kolimbris, 2 ed., 2004,PEI
3. Optical Networks: Third Generation Transport Systems – UylessBlack, 2 ed., 2009,PEI
4. Optical Fiber Communications – Govind Agarwal, 2 ed., 2004,TMH.
5. Optical Fiber Communications and Its Applications – S.C.Gupta, 2004,PHI.

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	Wireless Communications & Networks	**Course Code**	23ECEPCD9
Hours/Week	4	**Credits**	4

UNIT I:

Wireless Communications & System Fundamentals:

Introduction to wireless communications systems, examples, comparisons & trends, Cellular concepts-frequency reuse, strategies, interference & system capacity, trucking & grade of service, improving coverage &capacity in cellular systems.

UNIT II

Multiple Access Techniques for Wireless Communication:

FDMA, TDMA, SSMA (FHMA/CDMA/Hybrid techniques), SDMA technique (AS applicable to wireless communications).Packet radio access-protocols, CSMA protocols, reservation protocols, capture effect in packet radio, capacity of cellular systems.

Wireless Networking:

Introduction, differences in wireless & fixed telephone networks, traffic routing in wireless networks – circuit switching, packet switching X.25 protocol.

Wireless data services – cellular digital packet data (CDPD), advanced radio data information systems, RAM mobile data (RMD). Common channel signaling (CCS), ISDN-Broad band ISDN & ATM, Signaling System no .7 (SS7)-protocols, network services part, user part, signaling traffic, services & performance

UNIT III:

Mobile IP and Wireless Application Protocol: Mobile IP Operation of mobile IP, Co-located address, Registration, Tunneling, WAP Architecture, overview, WML scripts, WAP service, WAP session protocol, wireless transaction, Wireless datagram protocol.

Wireless LAN Technology

Infrared LANs, Spread spectrum LANs, Narrow bank microwave LANs, IEEE 802 protocol Architecture, IEEE802 architecture and services, 802.11 medium access control, 802.11 physical layer.

UNIT IV:

Mobile Data Networks: Introduction, Data oriented CDPD Network, GPRS and higher data rates, Short messaging service in GSM, Mobile application protocol.

Ad-hoc Wireless Networks: Cellular and Adhoc wireless networks, applications, MAC protocols, Routing, Multicasting, Transport layer Protocols, quality of service browsining, deployment considerations, Adhoc wireless Internet

TEXT BOOKS

1. Wireless Communication and Networking – William Stallings, 2003,PHI.
2. Wireless Communications, Principles, Practice-Theodore, S.Rappaport, 2_{nd}Edn. 2002,PHI.
3. Principles of Wireless Networks – KavehPahLaven and P. Krishna Murthy, 2002,PE

REFERENCES

1. Wireless Digital Communications – KamiloFeher, 1999, PHI.
2. Telecommunication System Engineering – Roger L. Freeman, 4/ed., Wiley-Interscience,
John Wiley & Sons, 2004.

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	Global Positioning Systems	Course Code	23ECEPCD10
Hours/Week	4	Credits	4

UNIT I

GPS Principles: History of Navigation, GPS Constellation, Principle of operation, GPS Orbits, Orbital mechanics and satellite position determination, Time references, Various DOPs, signal structure, Code and carrier phase measurements, position estimation with pseudorange measurements.

UNIT II

Error in GPS: Satellite and receiver clock errors, Ephemeris error, Atmospheric errors, Receiver measurement noise and UERE. Error budget.

Datum coordinate systems: Geometry of ellipsoid, geodetic reference system. Geoid, Ellipsoid, Global and Regional datums WGS-84, IGS, ECI, ECEF.

UNIT III

GPS Modernization and DGPS: Future GPS satellites, new signals and their benefits, hardware and Software improvements. Principle and operation of DGPS. Code-based and carrier based DGPS Techniques, DGPS errors.

UNIT IV

GPS Augmentation systems: Relative advantages of SBAS and GBAS, Wide area augmentation system (WAAS) architecture, Link budget. GAGAN, EGNOS and MSAS. Local area augmentation system (LAAS) concept.

Applications of GPS: GPS applications, GPS integration – GPS/GIS, GPS/INS, GPS/pseudolite, GPS/cellular. Other satellite navigation constellations GLONASS and Galileo System.

Text Books

1. PratapMisra and Per Enge, "Global Positioning System Signals, Measurements,and Performance," Ganga-Jamuna Press, Massachusetts,2001.
2. B.Hofmann-Wellenhof,H.Lichtenegger,andJ.Collins,"GPSTheoryandPractice," Springer Wien, New York,2000.
3. Ahmed El-Rabbany, "Introduction to GPS," Artech House, Boston,2002.

Suggested Reading

1. Bradford W. Parkinson and James J. Spilker, "Global PositioningSystem: Theory and Applications," Volume II, American Institute of Aeronautics and Astronautics, Inc., Washington,1996.
2. Elliot D.Kaplan, "Understanding GPS Principles and Applications," ArtechHouse, Boston,1996.
3. A.Leick, "GPS Satellite Surveying", John Wiley and sons,1990.

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	Microwave Antennas	Course Code	23ECEPCD11
Hours/Week	4	Credits	4

UNIT-I

Antenna Parameters: Radiation Patterns, Radiation Power Density, Radiation Intensity, Gain, Antenna Efficiency, Bandwidth, Polarization, Input Impedance, Antenna Radiation Efficiency, Antenna as an Aperture, Directivity and maximum Aperture, Friis Transmission Equation, Antenna Temperature.

UNIT-II

Reflector Antennas: Plane Reflector, Corner Reflector, 90_o Corner Reflector, Other Corner Reflectors, Parabolic Reflector, Front-Fed Parabolic Reflector, Cassegrain Reflectors, Lens Antennas, Lenses with $n>1$, Lenses with $n<1$, Lenses with Variable Index of Refraction.

UNIT-III

Antenna Arrays: Introduction, Two Element Array, N-Element Linear Array- Uniform amplitude and Spacing, Broadside Array, Ordinary End-Fire Array, Phased Array, Hansen-Woodyard End-Fire Array, N-Element Linear Array- Directivity, Nonuniform Amplitude, Binomial Array-Design equations.

UNIT-IV

Microstrip Radiators: Definition of microstrip antenna, advantages and disadvantages of microstrip antennas, applications, Radiation mechanism and Radiation fields of microstrip antennas, excitation techniques.

Rectangular microstrip patch antennas: Introduction, Analysis of Rectangular patch radiators, The vector potential approach, Dyadic Green's Function Techniques, the cavity model, Model Expansion Model, the transmission line model, Bandwidth Enhancement Techniques.

Suggested reading:

1. J.D. Kraus, Antennas, MC Graw-Hill, ISE,1988.
2. Constantine A. Balanis, "Antenna theory analysis and Design", John Wiley.
3. J.J. Bahland Bhartia, "Microstrip antennas", Artech House,1982.

References:

1. Samuel Silver, "Microwave Antenna – Theory and Design", IEE Press, London1984.
2. James J. Hall, P.S. Wood, MicrostripAntenna – Theory and Design,1981.

Name of the Program	Ph.D. Course work (ECE) UIET	Program Code	
Name of the Course	Image & Video Processing	**Course Code**	23ECEPCD12
Hours/Week	4	**Credits**	4

UNIT I

Fundamentals of Image Processing and Image Transforms

Basic steps of Image Processing System Sampling and Quantization of an image – Basic relationship between pixels

Image Transforms: 2 D- Discrete Fourier Transform, Discrete Cosine Transform (DCT), Wavelet Transforms: Continuous Wavelet Transform, Discrete Wavelet Transforms.

UNIT II

Image Processing Techniques

Image Enhancement

Spatial domain methods: Histogram processing, Fundamentals of Spatial filtering, Smoothing spatial filters, Sharpening spatial filters.

Frequency domain methods: Basics of filtering in frequency domain, image smoothing, image sharpening, Selective filtering.

Image Segmentation

Segmentation concepts, Point, Line and Edge Detection, Thresholding, Region Based segmentation.

UNIT III

Image Compression

Image compression fundamentals - Coding Redundancy, Spatial and Temporal redundancy, Compression models: Lossy& Lossless, Huffman coding, Arithmetic coding, LZW coding, Run length coding, Bit plane coding, Transform coding, Predictive coding, Wavelet coding, JPEG Standards.

Basic steps of Video Processing

Analog Video, Digital Video. Time-Varying Image Formation models: Three-Dimensional Motion Models, Geometric Image Formation, Photometric Image Formation, Sampling of Video signals, Filtering operations.

UNIT V

2-D Motion Estimation

Optical flow, General Methodologies, Pixel Based Motion Esimation, Block- Matching Algorithm, Mesh based Motion Estimation, Global Motion Estimation, Region based Motion Estimation, Multi resolution motion estimation, Waveform based coding, Block based transform coding, Predictive coding, Application of motion estimation in Video coding.

TEXTBOOKS

1. Digital Image Processing – Gonzaleze and Woods, 3rd ed.,Pearson.
2. Video processing and communication – Yao Wang, JoemOstermann andYa–quin Zhang. 1st Ed., PHInt.

REFRENCES :

1. Digital Video Processing – M. Tekalp, Prentice HallInternational

Annexure AC/6.10

~~Annexure A7~~

Maharshi Dayanand University, Rohtak

(A State University Established Under Haryana Act No. XXV of 1975)
A+ Grade University Accredited by NAAC

No. ACS-I/II/III/2026/ 16320-363
Dated : 30/6/2026

To

1. All the HoDs/ Directors of UTDs/Institutes/Centers,M.D. University, Rohtak
2. Director, MDU-CPAS, Gurugram

Sub:- Amendment in Assessment Mechanism of various Programs under NEP-2020.

Sir/Madam,

In terms of orders passed by competent Authority, following is brought to your notice for further necessary action :-

1. The Formative Assessment Mechanism of UG, PG, PG Diploma, Ph.D Programs and Certificate Courses is rolled back to the previous system of Term End Examinations Mechanism comprising Internal Assessment (30%) and Term End Examinations (70%) except in case of Multidisciplinary and Value Added Courses in UG Programs 2026-27.
2. The aforesaid amendment made in the Formative Assessment shall be implemented in all semesters of UG, PG, PG Diploma, Ph.D Programs and Certificate Courses under NEP-2020 w.e.f. the session 2026-27 including the students admitted in the academic session 2025-26.
3. The reappear cases in Formative Assessment of students admitted in 2025-26, if any, will be allowed for assessment in the same pattern in which he/she appeared in previous semester. For this propose, each such student will have to submit the reappear form as per examination rules.

In light of aforementioned directions, the HoDs/Directors of UTDs/Centres/Institutes are requested to undertake necessary steps for amendments/ updation of Scheme of Examination (SOE) and Syllabi of related UG, PG, PG Diploma, Ph.D. Programs and Certificate Courses.The revised/updated Scheme of Examination (SOE) and Syllabi must be supplied within 15 days from the date of issuing this letter.

This may be treated as most urgent so that the amended/updated SOE/Syllabi are uploaded on the University Website well in time before start of the next Academic Session 2026–27.

30/6/26

Assistant Registrar (Academic)
for REGISTRAR

Endst. No. ACS-I/II/III/2026/ 16264-564 **Dated:** 30/6/2026

Copy of the above is forwarded to the following for information and necessary action :-

1. Deans of Faculties, M.D. University, Rohtak
2. Director, MDU-CPAS, Gurugram
3. Director, CCDD, M.D. University Rohtak
4. Controller of Examinations, M.D. University, Rohtak
5. Director, IQAC, M.D. University, Rohtak
6. Director, University Computer Centre, M.D. University, Rohtak
7. All Principals/Directors of the Colleges/Institutes affiliated to M.D. University, Rohtak
8. Deputy/Assistant Registrar (Secrecy/Conduct/Result-I,II,III,IV), M.D. University, Rohtak.
9. OSD/PA to the Vice-Chancellor/Dean Academic Affairs/Registrar (for kind information to the Vice-Chancellor/Dean Academic Affairs/Registrar) M.D. University, Rohtak.

30/6/26

Assistant Registrar (Academic)
for REGISTRAR

UNIVERSITYINSTITUTEOFENGINEERING&TECHNOLOGY MAHARSHI DAYANAND UNIVERSITY, ROHTAK

SCHEMEOFSTUDIES&EXAMINATIONS

Doctor of Philosophy (Ph.D.) Course Work

COMPUTERSCIENCE&ENGINEERING

Scheme of Examination w.e.f.2025-26

Program Specific Outcomes (PSOs)

Upon successful completion of the Ph.D. (Computer Science and Engineering) Course Work programme, the students will be able to:

PSO1: Formulate a well-defined and feasible research proposal, select appropriate research methodologies, and critically justify and defend the chosen methodology.

PSO2: Demonstrate a clear understanding of the various stages and tasks involved in conducting independent and systematic research.

PSO3: Identify, access, and utilize appropriate scholarly resources, tools, and technologies required to effectively carry out the research process.

PSO4: Document research work systematically and present findings clearly and coherently in the candidate's chosen research area.

PSO5: Acquire in-depth knowledge of advanced and emerging research trends in the candidate's specialization within the field of Computer Science and Engineering.

Duration: One Semester (Six months)
Total Credits: 12 credits

Sr.No.	Course Code	CourseTitle	Credits	Marks	Hours per week
1.	23CCPH11C2	Research Methodology (Quantitative Techniques and Computer Applications in Research)	4	100	4
2.	23CCPH11C1	Research and Publication Ethics	2	50	2
3.	23CSEPH11C1	Review of Literature and Seminar (in Relevant Research Area)	2	50	2
4.		Departmental Elective Subject (any one from the list attached at annexure 'A') Elective Subject	4	100	4
	Total		**12**	**300**	**12**

Note: The compulsory course on 'Research and Publication Ethics' shall be offered byChaudhary Ranbir Singh Institute of Social and Economic Change.

The formative assessment as under, will be applicable for the assessment:

Marks distribution (For Four four-credit theory course)	**Marks**
Written test (2 X 15)	30
MCQs/ Quizzes/ Group Discussion (2 X 10)	20
Case study / Mini project (1 X 25)	25
Seminar / Presentation (2 X 10)	20
Attendance	05
Total	100

Marks distribution (For Two Credit Theory Course)	**Marks**
Written test (2 X 5)	10
Peer discussion / Debate / Extempore speech (2X 10)	20
Role play	05
Essay / Article / Report writing	10
Attendance	05
Total	50

Program Name	Ph.D.[CSE] UIET	Program Code	
Course Name	Research Methodology (Quantitative Techniques and Computer Applications in Research)	Course Code	23CCPH11C2
Credits	4	No. of hours/Week	4

Objectives and Outcomes of this course paper

Learning Objectives:

1. To understand the fundamentals concepts of research process, various models of research and report writing concepts.
2. To learn various statistical analysis techniques for data analysis and hypothesis testing.
3. To understand the concepts of measurement and scaling & their various techniques and sample size determination.
4. To learn various types of data collection techniques, types of data, analysis and interpretation of data.
5. To understand the role of computer in mathematical and statistical analysis in research and to get the idea about applications of relevant research methodologies with special reference to research in computer science.

Learning Outcomes:

By the end of the course the students will be able to:

1. Learn the concept of research, research process, types of research, research models and basics formats of report writing.
2. Learn the use of statistical analytic techniques for data analysis and testing of hypothesis.
3. Identify thedifferencesbetweenmeasurementandscalingandhowsampleisselected and determined using various approaches.
4. To understand sources of data collection and how data is collected from different sources.
5. To understand the concept of interpretation and role of computer in mathematical and Statisticalanalysiswithapplicationsofrelevantresearchmethodologiesusedincomputer science& Engineering.

UNIT I

Element of Research: Scientific process meaning and definition, a brief history of scientific process. Introduction to research methodology- Meaning of research, objective of research, types of research, significance of research, problem encountered by researchers in India, Research problem- Definition, necessity and techniques of defining research problem, formulation of research problem, objective of research problem, research design-Meaning, need and features of good research design, types of research designs, basic principles of Experimental design. Sampling design census and sample surveys, different types of sample designs, characteristics of good sample design, Techniques of selecting a random sample. Data collection-primary and secondary data, methods of selecting primary and secondary data.

UNIT II

Hypothesis & Statistical Analysis: Hypothesis- definition, testing of hypothesis, procedures of hypothesis testing, flow diagram for hypothesis testing, parametric and non-parametric tests for testing of hypothesis, limitations of tests of hypothesis. Hypothesis tests-One sample test-two sample tests/ chi square tests, association of attributes. T-tests, statistical analysis, correlation and regression analysis- analysis of variance, completely randomized design, randomized complete block design, Latin square design-partial and multiple correlations– discriminant analysis - cluster analysis – principle component and factor analysis, repeated measure analysis. Probability and probability distributions; Binomial, Poisson, distribution, Basic ideas of testing of hypotheses; Tests of significance based on normal distributions.

UNIT III

Paper Writing and Report Generation: Basic concepts of paper writing and report generation, review of literature, concepts of bibliography and references, significance of report writing, steps of report writing, types of research reports, methods of presentation of report.

UNIT IV

Computer Applications in Research: Computer Applications: Fundamentals of computers-Definition, types of computers, RAM, ROM, CPU, I/O devices, Number systems-Binary, octal and hexadecimal, base conversion, logic gates- AND, OR, NOT, Operating system-definition, types of operating system, Database system – definition & applications, Networks – definition & applications, Internet & its applications, Web Searching, Email, Uses of software's MS-Office-Power Point, Word, Excel and Access.

TextBooks:

1. C.R.Kothari–Research Methodology Methods and Techniques– WishwaPrakashan Publishers – Second Edition.

RESEARCH AND PUBLICATION ETHICS
(23CCPH11C1)
(Compulsory for all Ph.D. Course Work)

Syllabus of Research and Publication Ethics shall be provided by Chaudhary Ranbir Singh Institute of Social and Economic Change**.**

Program Name	Ph.D.[CSE] UIET	Program Code	
Course Name	Review of Literature and Seminar (in Relevant Research Area)	Course Code	23CSEPH11C1
Credits	2	No. of hours/Week	2

1. The research student is required to prepare a concept paper/working, paper/review paper by reviewing at least 50 research papers / references books / unpublished doctoral dissertations / other reports etc.

2. To qualify the paper the research student is required either to present the prepared paper in an International Conference/ Seminar/ Workshop or publish the same in a research journal. Acceptance for publication or presentation will be considered as published/ presented.

3. A duly constituted committee of three teachers of the department by the Director/Head shall evaluate the completion of the paper.

SYLLABUS (Pre PhD CSE) Annexure -1

List of Departmental Elective Subjects:

1	23CSEPH11C2	Advanced Information Security Systems
2	23CSEPH11C3	Digital Image Processing
3	23CSEPH11C4	Neural Networks
4	23CSEPH11C5	Advanced Topics in Database Systems
5	23CSEPH11C6	Performance Modelling
6	23CSEPH11C7	Data Warehousing and Mining
7	23CSEPH11C8	Software Testing and Quality Assurance
8	23CSEPH11C9	Embedded Systems
9	23CSEPH11C10	Advanced Wireless Networks
10	23CSEPH11C11	Genetic Algorithms
11	23CSEPH11C12	Grid Computing
12	23CSEPH11C13	Mobile Computing
13	23CSEPH11C14	Advanced Multimedia Technology
14	23CSEPH11C15	Parallel Computing
15	23CSEPH11C16	Web Engineering
16	23CSEPH11C17	Fuzzy Logic
17	23CSEPH11C18	Advanced Networking and Protocols
18	23CSEPH11C19	Intelligent Systems
19	23CSEPH11C20	Information Processing and E-commerce

Note: Note: More Elective Papers may be added from time to time depending upon the availability of the Expertise in the Department and its suitability for the researchers.

Program Name	Ph.D.[CSE] UIET	ProgramCode	
CourseName	AdvancedInformationSecurity Systems	CourseCode	23CSEPH11C2
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. To provide an understanding of principal concepts, major issues, technologies, and basic approaches in information security.
2. To develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks, and representative applications.
3. To gain familiarity with prevalent network and distributed system attacks, defenses against them, and forensics to investigate the aftermath.
4. To develop a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
5. To develop an understanding of security policies (such as authentication, integrity, and confidentiality), as well as protocols to implement such policies in the form of message exchanges.

Learning Outcomes:

1. To master information security governance, and related legal and regulatory issues.
2. To be familiar with how threats to an organization are discovered, analyzed, and dealt with.
3. To be familiar with network security threats and countermeasures.
4. To be familiar with network security designs using available secure solutions (such as PGP, SSL, IPSec, etc.).
5. To be familiar with advanced security issues and technologies (such as DDoS attack detection and containment, and anonymous communications).

UNIT 1

Cryptography: Basic Concepts, Cryptosystems, Crypto-Analysis, Ciphers & Cipher Modes, DES, AES, RSA algorithm, Key Management Protocols, Diffie Hellmann Algorithm, Digital Signatures, Message Digest, Secure Hash Algorithms, Public Key Infrastructure.

UNIT II

Information Theory: Basic of Probability & Statistics, Shannon Characteristics, Perfect Secrecy, Confusion and Diffusion, Information Theoretic Tests, Unicity Distance, Entropy, Floating Frequency, Histogram, Autocorrelation, Periodicity, Random Analysis Tests, Zero Knowledge Technique.

UNIT III

Mathematical Security: Basic Number Theory, Congruence, Chinese Remainder Theorem. Finite Fields, Discrete Logarithm, Bit Commitment, Random Number Generation, Inverses, Primes, Greatest Common Divisor, Euclidean Algorithm, Modular Arithmetic, Properties of Modular Arithmetic, Computing the inverse, Fermat's Theorem, Algorithm for Computing Inverses,NP-CompleteProblems,CharacteristicsofNP-CompleteProblems,MeaningofNP-Completeness, NP-Completeness and Cryptography.

UNIT IV

Network Security: Network Threats, Authentication & Access Control Mechanism, Secured Communication Mechanisms, Biometric, Secured Design for LAN, Firewall, Intrusion Detection System, Virtual Private Network, Email and Web Security. WEP, Access Controls, Secure Socket Layer, IPSEC, WAP Security, Security Issues, Challenges &Defense Mechanisms for Bluetooth, GSM, CDMA, GPRS, Wi-Fi, Wi-Max & IEEE Standards.

References:

1. Security in Computing, Charles P. Pfleeger, Prentice-Hall International, Inc.
2. Applied Cryptography: Protocols, Algorithms, and Source Code in C, Bruce Schneier, John Wiley & Sons, Inc., 1995.
3. Digital Certificates and Applied Internet Security, Jalal Feghhi, Jalli Feghhi, and Peter Williams, Addison-Wesley Longman.
4. Introduction to Cryptography with Coding Theory, Wade Trappe and Lawrence C. Washington, Pearson Education.
5. Network Security: The Complete Reference, Tata McGraw-Hill.
6. Fundamentals of Computer Security, Josef Pieprzyk, Thomas Hardjono, and Jennifer Seberry, Universities Press (India) Pvt. Ltd.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	Digital Image Processing	CourseCode	23CSEPH11C3
Credits	4	No.of hours/Week	4

Objectives and Outcomes of this course paper

Learning Objectives:

1. To explain digital image processing by describing its different components and processes.
2. To describe different methods for enhancing and quantizing digital images.
3. To illustrate the relevance and need for image transformation and filtering processes.
4. To understand image smoothing and sharpening, as well as color image processing.
5. To comprehend edge detection, compression, segmentation, and image representation.

LearningOutcomes:

By the end of the course, students will be able to:

1. Process, quantize, and perform sampling on given images.
2. Transform and filter digital images to improve image quality.
3. Generate color images by applying different image characteristics using various color models.
4. Compress digital images by applying different lossless and lossy compression techniques.
5. Identify different methods of image representation and restoration of digital images.

UNIT 1

Introduction and Fundamentals: The origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamentals Steps in Image Processing, ComponentsofanImageProcessingSystems,ImageAcquisition,ImageSamplingand

Quantization, Some basic relationships like Neighbours, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations.

UNIT II

Image Enhancement in Spatial Domain & Frequency Domain: Some basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Basics of Spatial Filters, Smoothening and Sharpening Spatial Filters. Introduction to Fourier Transform and the frequency Domain, Properties of 2-D Fourier Transform, Smoothing and Sharpening Frequency Domain Filters.

UNIT III

Image Restoration &Compression:A model of The Image Degradation / Restoration Process, Noise Models, Mean Filters, Order-Statistics Filters, Adaptive Filters, Bandreject Filters, Bandpass Filters, Notch Filters, Minimum Mean Square Error (Wiener) Filtering, geometric mean Filter, Inverse Filtering, Coding, Interpixel and Psychovisual Redundancy, Image Compression models, Elements of Information Theory, Error free compression, Lossy compression, Image compression standards.

UNIT IV

Image Segmentation & Object Recognition: Detection of Discontinuities, Edge linkingand boundary detection, Thresholding, Region Oriented Segmentation. Patterns and Pattern Classes, Minimum Distance Classifier, matching by Correlation, bayes Classifier.

Text/ReferenceBooks:

1. RafaelC.Gonzalez&RichardE.Woods,"DigitalImageProcessing",2nd edition, Pearson Education, 2004
2. A.K.Jain,"Fundamental ofDigital ImageProcessing",PHI,2003
3. RosefieldKak,"DigitalPictureProcessing", 1999.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	NeuralNetworks	CourseCode	23CSEPH11C4
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. Understand the role of neural networks in engineering, artificial intelligence, and cognitive modeling.
2. Provide knowledge of supervised learning in neural networks.
3. Provide knowledge of computation and dynamical systems using neural networks.
4. Provide knowledge of reinforcement learning using neural networks.
5. Provide knowledge of unsupervised learning using neural networks.
6. Provide hands-on experience in selected neural network applications.

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Explain the role of neural networks in engineering, artificial intelligence, and cognitive modeling, including feed-forward neural networks of increasing complexity, gradient descent learning and its extensions, and learning and generalization theory.
2. Demonstrate sufficient theoretical knowledge to reason about the behavior of neural networks.
3. Evaluate whether neural networks are appropriate for a particular application.
4. Apply neural networks to specific applications and identify steps required to improve performance.

UNIT1

NeuronModelandNetworkArchitectures: Objective,History,Applications,biological inspiration, Neuron Model, Transfer Functions, Network Architectures.

UNIT II

Learning Rules: Perception Learning: Learning Rules, Perceptron Architecture, Perceptron Learning Rule, Training Multiple Neuron Perceptrons. Unsupervised Learning. Supervised Hebbian Learning: The Hebb Rule, Performance Analysis, Application, Variations ofHebbian Learning.

UNITIII

Transformations & Optimization: Linear Vector Spaces, Spanning a Space, Inner Product, Norm, Orthogonality, Vector Expansions, Linear Transformations, Matrix Representations, Change of Basis, Eigenvalue and Eigenvectors. Performance surfaces and Optimization: Taylor Series, Directional Derivatives, Necessary Condition for Optimality, Quadratic Functions, Optimization Techniques; Steepest Descent, Newton's method, Conjugate Gradient Method.

UNITIV

Back propagation & Competitive Networks: The Backpropagation Algorithm;Performance Index, Chain Rule, Example, Drawbacks of Backpropagation, Heuristic Modifications; Momentum, Conjugate Gradient, Levenberg-Marquardt Algorithm. AssociativeLearningandCompetitiveNetworks: SimpleAssociativeNetwork,Unsupervised Hebb Rule, Kohonen Rule, Competitive Learning Rule, Self Organizing Feature Maps.

Text/ReferenceBooks:

1. M.T.Hagan, H.B.Demuth and M.Beale, "Neural Network Design" Thomson Learning, 2002
2. SimonHaykin,"NeuralNetworks–AComprehensiveFoundation,"2nd Edition,Pearson Education, 1999.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	AdvancedTopicsinDatabase Systems	CourseCode	23CSEPH11C5
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

LearningObjectives:

Thereareseveralobjectivesfromthiscourseincluding:

1. Learningstate-of-arttechniquesindatabasesystemsandinformationmanagementthat you can apply to your future research and/or your practical work.
2. Learninghowtoprepareandpresenttechnicalpaperswhichisanessentialskillfor students and researchers.
3. Learning how to review papers. Reviewing technical and scientific papers is a skill thatyou need to develop. Throughout this course, you will review several papers.
4. Workingin a semester-longproject thatcan potentiallylead to apublication.

LearningOutcomes:

1. Define program-data independence, data models for database systems, database schema and database instances.
2. Recall Relational Algebra concepts, and use it to translate queries to Relational Algebra statements and vice versa.
3. Identify Structure Query Language statements used in creation and manipulation of Database Identify the methodology of conceptual modeling through Entity Relationship model.
4. Identifythemethodologyoflogical model.Identifythemethodologyofphysical model.
5. Develop an understanding of the differences between OODBMS, ORDBMS andRDBMS and the practical implications of each approach.
6. Analyze and design a real database application. Develop and evaluate a real database application using a database management system.

UNIT1

Indexing: Types of Single-Level Ordered Indexes, Multilevel Indexes, Dynamic Multilevel Indexes Using B-trees and B+-trees

UNITII

Concurrency control: Locking Techniques for Concurrency Control, Concurrency Control Techniques Based on Timestamp Ordering.

UNITIII

Introduction to Transaction Processing, Transaction and System Concepts, Desirable Properties of Transactions, Schedules and Recoverability, Serializability of Schedules.

UNITIV

Parallel & Distributed databases: Introduction, I/O parallelism, inter-query parallelism, intra-query parallelism, interoperation parallelism, Design of parallel systems.Distributeddatastorage,Networktransparency,Distributedqueryprocessing, Distributed transaction model, commit protocols, coordinator selection, concurrency control, deadlock handling.

TEXT BOOKS

1. DatabaseSystemConceptsbyA.Silberschatz,H.F.KorthandS.Sudarshan,3rd edition, 1997, McGraw-Hill and International Edition.
2. FundamentalsofDatabaseSystemsbyR.Elmasriand S.B.Navathe,3rdedition.
3. An Introduction to Database Systems by C.J.Date, 7th edition, Addison-Wesley, Low Priced Edition, 2000
4. Database Management and Design by G.W Hansen, 2nd edition, 1999, Prentice-Hallof India, Eastern Economy Edition.
5. DatabaseManagementSystemsby A,.K.MajumdarandP.Bhattacharyya.5thedition, 1999, Tata McGraw-Hill Publishing.
6. DataManagement&file StructurebyLoomis,1989, PHI

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	PerformanceModelling	CourseCode	23CSEPH11C6
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

LearningObjectives:

1. To develop the modelling and mathematical skills to analytically determine computer systems and analytically determine computer systems and communication network performance.
2. Students should be able to read and understand the current performance analysis and queueing theory literature upon completion of the course.
3. Understandstrengths andweaknessesofQueueingModels

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Calculate and apply measures of location and measures of dispersion for both grouped and ungrouped data.
2. Apply discrete and continuous probability distributions to various business problems.
3. Perform tests of hypothesis and calculate confidence intervals for population parameters for single-sample and two-sample cases, and understand the concept of *p*-values.
4. Apply non-parametric tests such as the Chi-square test for independence and goodness of fit.
5. Compute and interpret the results of bivariate and multivariate regression and correlation analysis for forecasting.

UNIT1

Probability: Review of Probability, Random variables and Distributions; Generating functions and transforms; Poisson, Markov and semi-Markov processes.

UNITII

Queuing Systems: Characteristicsofqueueingsystems; Little'sformula;Markovian andnon-Markovian queueing systems; embedded Markov chain applications to M/G/1, G/M/1, and related queueing systems.

UNITIII

Networks Simulations: Networksofqueues;openandclosedqueueingnetworks,algorithms to compute the performance metrics. Simulation techniques for queues and queueing networks.

UNITIV

Advanced Topics: Advanced topics like queues with vacations, priorityqueues, queues with modulated arrival process, and discrete time queues; introduction to matrix-geometric methods; applications of the theory to the performance modelling of computer and communication networks.

TextsandReferences:

1. D.GrossandC.Harris,FundamentalsofQueueingTheory,3rdEdition,Wiley, 1998.
2. R.B.Cooper,IntroductiontoQueueingTheory,2ndEdition,North-Holland, 1981.
3. L.Kleinrock,QueueingSystems,Vol.1:Theory,Wiley,1975;Vol.2:Computer Applications,Wiley,1976.
4. R.Nelson,Probability,StochasticProcesses,andQueueingTheory:The Mathematics of Computer Performance Modelling, Springer, 1995.
5. E.GelenbeandG.Pujolle,IntroductiontoQueueingNetworks,2ndEdition, Wiley, 1998.
6. T.G. Robertazzi, Computer Networks and Systems: Queueing Theory and Performance Evaluation, 3rd Edition, Springer, 2000.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	DataWarehousingandMining	CourseCode	23CSEPH11C7
Credits	4	No.of hours/Week	4

Objectives and Outcomes of this course paper

Learning Objectives

1. To differentiate between database systems (OLTP) and data warehouse technology (OLAP).
2. To understand the characteristics, schemas, components, and designing principles of a data warehouse.
3. To comprehend the different phases of the Knowledge Discovery from Data (KDD) process.
4. To describe in detail the integral steps of data preprocessing, with a focus on OLAP operations and OLAP servers.
5. To learn the details and applications of different data mining techniques and their respective algorithms.

Learning Outcomes

By the end of the course, students will be able to:

1. Compare different types of data and propose appropriate analysis techniques based on the data type.
2. Perform the prerequisite phases of Extract, Transform, and Load (ETL) on a given dataset.
3. Prepare a given dataset by applying different preprocessing techniques to clean, transform, and reduce the data.
4. Implement different data mining techniques on the preprocessed dataset to extract hidden patterns from data.
5. Evaluate different techniques and propose models using appropriate performance evaluators.

UNIT1

Data Warehousing Architecture: Introduction to Data Warehousing: Evolution of Data Warehousing, Data Warehousing concepts, Benefits of Data Warehousing, Comparison of OLTP and Data Warehousing, Problems of Data Warehousing. Architecture: Operational Data and Datastore, Load Manager, Warehouse Manager, Query Manager, Detailed Data, Lightly and Highly summarised Data, Archive/Backup Data, Meta-Data, architecture model, 2-tier, 3-tier and 4-tier data warehouse, end user Access tools.

UNITII

Data Warehousing Tools and Technology: Tools and Technologies: Extraction, cleaning and Transformation tools, Data Warehouse DBMS, Data Warehouse Meta-Data, Administration and management tools, operational vs. information systems.OLAP& DSS support in data warehouse.

UNITIII

Distributed Data Warehouse & Knowledge discovery: Types of Distributed Data Warehouses, Nature of development Efforts, Distributed Data Warehouse Development, Building the Warehouse on multiple levels.Knowledge discovery through statistical techniques, Knowledge discovery through neural networks, Fuzzy technology & genetic algorithms.

UNITIV

Types of Data Warehouses & Data Warehouse Design: Host based, single stage, LAN based, Multistage, stationary distributed & virtual data-warehouses. Data warehousing Design: Designing Data warehouse Database, Database Design Methodology for Data Warehouses, Data Warehousing design Using Oracle, OLAP and data mining: Online Analytical processing, Data mining.

TextBooks:

1. Buildingthe Data Warehouse, W.H.Inmon, 3rdEdition,JohnWiley&Sons.
2. DevelopingtheDataWarehouse,W.H.Inmon,C.Kelly,John Wiley& Sons.
3. Thomas Connoly, Carolyn Begg-"Database Systems-A practical approach to. Design, Implementation and management" 3rd Edition Pearson Education
4. W.H.Inmon, C.L.Gassey, "Managing the Data Warehouse", John Wiley &Sons.Fayyad, Usama M. et. al., "Advances in knowledge discovery & DataMining", MIT Press.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	SoftwareTestingandQuality Assurance	CourseCode	23CSEPH11C8
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. To understand the various software testing techniques and the software testing life cycle.
2. To understand and use software testing strategies and metrics for testing.
3. To study object-oriented testing strategies and related issues.
4. To explain the concepts of software reliability and software quality assurance.
5. To study quality management standards and methods.

Learning Outcomes

By the end of the course, students will be able to:

1. Demonstrate knowledge of various software testing techniques.
2. Apply software testing strategies and metrics for software testing.
3. Demonstrate knowledge of object-oriented testing strategies.
4. Explain concepts of software reliability and software quality assurance.
5. Demonstrate knowledge of quality management standards and methods.

UNIT1

Introduction: A perspective on Testing, STLC, Functional testing: Boundary value testing, Equivalence – class testing, Decision Table Testing etc., Retrospective on FunctionalTesting;Structuraltesting:pathtesting, data flow testing,mutationtesting, etc.Retrospective testing, Levels of testing: Integration testing, system testing, acceptance testing.

UNITII

Tools & Technologies: Object-oriented Testing, Interaction testing, testing of Web Applications,Testingmetrics,TestingParadigms:Scriptedtesting,Exploratorytesting,Test

planning,SupportingTechnologies:Defecttaxonomies,Testingtoolsandstandards,Casestudies.

UNITIII

Quality Models: Introduction to Software Quality, Quality Models: McCall's Model, Hierarchical model. FCMM, Measuring Software Quality, Quality Metrics: Process, Product, Quality Control Tools, Quality assurance concept, importance, Requirements for SQA works.

UNITIV

Standards: Pareto Principle to SQA, Costs of Software Quality, SQA metrics, Audit Review, Walkthrough,Inspectiontechniques,SQAplan.,Qualitystandards:SEI-CMM,ISO9000series, comparison between SEI CMM and ISO 9000.

References:

1. A Practitioner's Guide to Test Case Design, Lee Copeland, Artech House Publishers, Boston–London.
2. Software Testing: A Craftsman's Approach, Paul C. Jorgensen, Auerbach Publications / CRC Press LLC.
3. Software Quality: Theory and Management, Alan C. Gillies, Chapman & Hall.
4. Software Quality, Garry S. Marnis (or Marlin/Marliss*), Thomson.
5. Metrics and Models in Software Quality Engineering, Stephen H. Kan, Pearson Education.
6. Handbook of Software Quality Assurance, G. Gordon Schulmeyer, Artech House Publishers, Boston–London.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	Embedded Systems	CourseCode	23CSEPH11C9
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. To gain knowledge about the basic working of a microcontroller system and its programming in assembly language.
2. To provide experience in integrating hardware and software for microcontroller-based application systems.

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Acquire knowledge about microcontrollers, embedded processors, and their applications.
2. Develop the ability to understand the internal architecture of microcontrollers and the interfacing of different peripheral devices.
3. Develop the ability to write programs for microcontrollers.
4. Develop the ability to understand the role of embedded systems in industry.
5. Develop the ability to understand the design concepts of embedded systems.

UNIT1

Introduction: The concepts of embedded system design, embedded microcontroller cores, embedded memories, examples of embedded systems. Technological aspects of embedded system: interfacing between analog and digital blocks, signal conditioning, Digital signal processing, subsystem interfacing, interfacing with external systems, user interfacing, Design tradeoffs due to process compatibility, Thermal consideration etc. Software aspects of embedded systems: real time programming languages and operating systems.

UNITII

Architecture: Introduction, CPU architecture, registers, instruction sets addressing modes Loop timing, timers, Interrupts; Interrupt timing, I/o Expansion, I2C Bus Operation Serial EEPROM, Analog to digital converter, UART Baud Rate-Data Handling-Initialization, Special Features - serial Programming-Parallel Slave Port.

UNITIII

Processors: Motorola MC68H11 Family Architecture Registers, Addressing modes Programs. Interfacing methods parallel I/o interface, Parallel Port interfaces, Memory Interfacing, High Speed I/o Interfacing, Interrupts-interrupt service routine-features of interrupts-Interrupt vector and Priority, timing generation and measurements, Input capture, Output compare, Frequency Measurement, Serial I/o devices RS.232, RS.485. Analog Interfacing, Applications. ARM processors.

UNITIV

System Development: Embedded system development, Embedded system evolution trends. Round - Robin, robin with Interrupts, function-One-Scheduling Architecture, Algorithms. Introduction to-assembler-compiler-cross compilers and Integrated Development Environment (IDE). Object Oriented Interfacing, Recursion, Debugging strategies, Simulators.

TextBooks:

1. DavidE Simon, "Anembedded softwareprimer",Pearson education Asia,2001.
2. JohnBPeatman"DesignwithMicrocontroller ",PearsoneducationAsia,1998.
3. Jonartthan W. Valvano Brooks/cole " Embedded Micro computer Systems. Real time Interfacing ", Thomson learning 2001.

References:

1. Burns,AlanandWellings,Andy,"Real-TimeSystemsandProgramming Languages", Second Edition. Harlow: Addison-Wesley-Longman, 1997.
2. RaymondJ.A.BhurandDonaldL.Bialey,"AnIntroductiontorealtimesystems: Design to networking with C/C++ ", Prentice Hall Inc. New Jersey, 1999.
3. Grehan Moore, and Cyliax, " Real time Programming: A guide to 32 Bit EmbeddedDevelopment. Reading " Addison-Wesley-Longman, 1998.
4. Heath,Steve, "EmbeddedSystemsDesign ",Newnes1997.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	AdvancedWireless Networks	CourseCode	23CSEPH11C10
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesofthiscoursepaper

Learning Objectives

In this course, students will:

1. Acquire solid knowledge of mobile networks and mobile computing.
2. Acquire experience and capability in teamwork.
3. Become familiar with mobile game development.

Learning Outcomes

On completion of this course, students should be able to:

1. Apply advanced data communication methods and networking protocols for wireless and mobile environments.
2. Utilize and employ application frameworks for developing mobile applications, including those operating in disconnected and weakly connected environments.
3. Create websites suitable for mobile environments.
4. Select appropriate components and networks for a particular application.
5. Creatively analyze mobile and wireless networks.
6. Critically analyze security issues of mobile and wireless computing systems.

UNIT1

Transmission & Spread Spectrum Techniques: Analog and Digital Data; Transmission fundamentals, Channel Capacity. Transmission Media. Multiplexing. LANs, MANs, and WANs. Switching Techniques; Circuit-Switching. Packet Switching. Asynchronous Transfer Mode-ATM. TheConcept ofSpread Spectrum.FrequencyHoppingSpread Spectrum. Direct Sequence Spread Spectrum. Code-Division Multiple Access. Generation of Spreading Sequences.

UNITII

Cellular & CDMA Technology: Cellular Network Concept, First Generation (1G) Analog, SecondGeneration(2G)DigitalTDMA.GSMandmobilitymanagementinGSM,Third

Generation Systems (3G) CDMA and 4 G Technology overview. Principles of Wideband CDMA (WCDMA), CDMAOne and CDMA2000, Universal Mobile Telecommunications System (UMTS), Evolution of Mobile Communication Networks, Call Controls and Mobility Management in CDMA.Quality of Service (QoS) in 3G Systems, CDMA network planning, design and applications.

UNITIII

Blue Tooth & IEEE 802.11 Wireless Networks: Radio Specifications. Base band Specification. Link Manager Specification. Logical Link Control and Adaptation Protocol. IEEE 802 Protocol Architecture. IEEE 802.11 Architecture and Services. IEEE 802.11 Medium Access Control. IEEE 802.11x Standards.

UNITIV

Wireless Application Protocol (WAP): The Wireless Application Protocol application environment, wireless application protocol client software, wireless application protocol gateways, implementing enterprise wireless application protocol strategy and Security Issues in Wireless LAN. Wireless network management, GPRS, and VOIP services.

Text/Reference:

1. WilliamStalling,WirelessCommunicationsandNetworks.PrenticeHall2002
2. Yi-BingLin,ImrichChlamtac,WirelessandMobileNetworkArchitecture,John Wiley-2001.
3. M.R.Karim,MohsenSarraf,W-CDMAandcdma2000for3GMobileNetworks, McGraw-Hill Professional, 2002.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	GeneticAlgorithms	CourseCode	23CSEPH11C11
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. To familiarize students with the mathematical foundations of genetic algorithms and their operators.
2. To study the applications of genetic algorithms.
3. To understand and analyze genetic-based machine learning and its applications.

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Describe the flow of a genetic algorithm and identify its elements.
2. Select and apply suitable operators and parameters for a genetic algorithm.
3. Analyze the design of a genetic algorithm and comment on its strengths and weaknesses.
4. Design genetic algorithms for single-objective and multi-objective optimization problems.

UNIT1

Genetic Algorithms in Scientific models: A brief history of evolutionary computation, Elements of Genetic Algorithms, A simple genetic algorithm, Applications of genetic algorithms, Evolving computer programs, data analysis & prediction, evolving neural networks, Modeling interaction between learning and evolution, modeling sexual selection, measuring evolutionary activity.

UNITII

Theoretical &ImplementationofGA: Schemas&Two-Armedandk-armedproblem,royal roads, exact mathematical models of simple genetic algorithms, Statistical- Mechanics Approaches. Data structures, Reproduction, crossover & mutation, mapping objective functions to fitness form, fitness scaling, coding, a multiparameter, mapped, fixed point coding, discretization and constraints.

UNITIII

Applications of genetic algorithms: The risk of genetic algorithms, De Jong & function optimization, Improvement in basic techniques, current application of genetic algorithms.

UNITIV

Advanced operators & techniques in genetic search: Dominance, duplicity, & abeyance, inversion & other reordering operators. Other micro operators, Niche & speciation, multiobjective optimization, knowledge based techniques, genetic algorithms & parallel processors.

TextBooks:

1. DavidE.Goldberg,"Geneticalgorithmsinsearch,optimization&Machine Learning" Addison Wesley, 1989

References:

1. MelanleMitchell,"An introductiontogeneticalgorithms"MITpress,2000.
2. Masatoshi Sakawa, "Genetic Algorithms & Fuzzy MultiobjectiveOptimization", Kluwer Academic Publisher, 2001
3. D. Quagliarella, J Periaux, C Poloni&G Winter, "Genetic Algorithms in Engineering & Computer science", John Wiley & Sons, First edition, 1997.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	Grid Computing	CourseCode	23CSEPH11C12
Credits	4	No.of hours/Week	4
DurationofEndtermexamination	3 hours	TotalMarks	100 (Th:70andIA:30)
Note: The examiner has to set a total of nine questions (two from each unit and one compulsory question consisting of short answer from all units (one question of four marks from each unit). The candidate hastoattemptone questioneachfromeachunitalongthecompulsory question(5x14=70 marks)			

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. Understand the need for and evolution of grids in the context of processor-intensive and data-intensive applications.
2. Become familiar with the fundamental components of grid environments, such as authentication, authorization, resource access, and resource discovery.
3. Be able to design and implement grid computing applications using Globus or similar toolkits.
4. Be able to justify the applicability or non-applicability of grid technologies for a specific application.

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Demonstrate thorough grounding in the architecture of grid computing and gain exposure to various infrastructure implementations.
2. Gain experience in using a specific grid implementation to construct a grid-based application.
3. Demonstrate awareness of current open research issues related to grid architecture and infrastructure.

UNIT1

Introduction: GridComputing&KeyIssues–Applications–OtherApproachesGrid Computing Standards – Pragmatic Course of Investigation.

UNITII

Benefits & Status of Technology: Motivations – History of Computing, Communications an Grid Computing – Grid Prime Time – Suppliers and Vendors – Economic Value-Challenges.

UNITIII

Architectures: Components of Grid Computing Systems and Architectures: Basic Constituent Elements– A Functional View – A Physical View – Service View.

UNITIV

Standards: Grid Computing Standards – OGSI: Standardization – Architectural Constructs – Practical View – OGSA/OGSI Service Elements and Layered Model – More Detailed view.

TextBooks:

1. ANetworkApproachtoGridComputing,DanielMinoli,WileyPublication.

References:

1. GridComputing–APracticalGuidetoTechnologyandApplications,Ahmar Abbas, Charles Media Publication.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	Mobile Computing	CourseCode	23CSEPH11C13
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. To understand the basic concepts and architecture of mobile communication networks.
2. To assess the capabilities of next-generation mobile networks and the role of wireless technologies in mobile network design and operation.
3. To evaluate network protocols, routing algorithms, connectivity methods, and network characteristics.
4. To understand different Mobile IP protocols and database issues in detail.
5. To evaluate wireless network topologies, wireless connectivity and characteristics, and the impact of wireless networks on security and Internet communications.

Learning Outcomes

By the end of the course, students will be able to:

1. Describe the basic concepts and principles of mobile computing.
2. Understand the concepts of Wireless LANs, PANs, mobile networks, and sensor networks.
3. Explain the structure and components of Mobile IP and mobility management.
4. Understand positioning techniques and location-based services and applications, and describe important issues and concerns related to security and privacy.
5. Apply fundamental design paradigms and technologies to mobile computing applications.
6. Appraise the quality and performance of mobile applications and MANETs, and assess and implement security principles in mobile applications.

UNIT1

Overview: Mobile Computing and Applications, Overview 1G,2G,3G,4G technologies, Mobile IP and IPv6,VoIP. CDPD- Architecture, air interface, radio resource allocation, roaming management. Mobile Adhoc networks: Characteristics of MANETs, spectrum of MANET applications, Security consideration in MANETs, AODV, DSR routing protocols.

UNITII

Mobility Management: Location Management, InterBS Handoff, Intersystem Handoff, Detection and assignment for handoff management, Strategies for handoff detection-Mobile controlled handoff, Network controlled handoff, mobile assisted handoff, handoff failure,hard handoff-MCHO link transfer, MAHO/NAHO link transfer, Soft handoff-adding and dropping new BS.

UNITIII

Mobile Services: 3Gmobileservices:Paradigmshiftin3Gsystems,WCDMA,CDMA2000, Improvements on core network, quality of service in 3G, Wireless operating systems for 3G handsets,DoCoMoW-CDMAfieldtrial.GSM:Architecture,locationtrackingandcallsetup, security, data services-HSCSD, GPRS, GSM location updates, mobility databases, failure restoration, International GSM call setup, reducing international call delivery cost.

UNITIV

WAP &Markup Scripts: Wireless application protocol: WAP model, WAP gateway, WAP protocols-wireless datagram protocol, wireless transport layer security, wireless transaction protocol, wireless session protocol, wireless application environment, wireless local loop architecture and deployment issues, wireless local loop technologies-satellite based systems, cellular based systems, fixed wireless access systems.

Wireless markup language and wireless markup script: Fundamentals of WML, Writing and formatting text, Navigating between cards and decks, Displaying images, Tables, Using variables, Acquiring User input, Introduction to WMLScript, Wml Script control Structures.

TextBooks:

1. YiBingLi “Wirelessand MobileNetworkArchitecture”,JohnWiley
2. Wrox“ThebeginningWMLandWMLscript”,WroxPublication
3. John Schiller

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	AdvancedMultimedia Technology	CourseCode	23CSEPH11C14
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. To introduce the concept of multimedia, its applications, and the integral elements of multimedia.
2. To illustrate different evolving technologies required for multimedia systems.
3. To enumerate the characteristics of multimedia software by discussing the importance of the authoring process and various authoring tools.
4. To gain in-depth knowledge of text, image, and sound fundamentals required for creating multimedia content.
5. To learn data compression techniques and develop an understanding of different multimedia standards.

Learning Outcomes

By the end of the course, students will be able to:

1. Design multimedia applications by effectively incorporating different multimedia components.
2. Identify different 3D technologies, including HDTV, UDTV, and hyperspeech.
3. Perform dithering on 24-bit color, 8-bit color, and 8-bit grayscale images.
4. Compress photographs and videos using both lossy and lossless compression techniques.
5. Create animated multimedia applications by incorporating different enhanced features.

UNIT1

Introduction: Concept of Multimedia, Media &data stream, main properties of multimedia system, Data stream characteristics &for continuous media Multimedia Applications, Hardware Software requirements, Storage Technologies: RAID, Optical Media.

UNITII

Compressions & File formats: Text, Basic sound concepts , MIDI , Speech ,Basic concept of Images, Graphics format ,Basic concepts of Video & animation, Conventional system, Computer based animation, Authoring Tools, Categories of Authoring Tools.

Compression Techniques: Lossless and Lossy compression, Run length coding, Statistical Coding, Transform Coding, JPEG, MPEG, Text compression using static Huffmann technique, Dynamic Huffman Technique, Arithmetic Technique.

UNITIII

Animations: Introduction, Basic Terminology techniques, tweaning& morphing, Motion Graphics 2D & 3D animation. Animation: Key frame animation, reactive animation, path animation, Skelton animation etc., deformers.

UNITIV

Advanced Topics: Dynamics: soft bodies, Rigid bodies and its usages in the scene etc., Rendering: soft, Hard rendering. IPR rendering, Line and box rendering etc., Special Effects: Shading & Texturing Surfaces, Lighting, Special effects. Working with MEL: Basics &Programming.

TextBook:

1. David Hillman,"MultimediaTechnology& Applications",Galgotia Publications, 2000

ReferenceBooks:

1. NigelChapman&JennyChapman,"Digital Multimedia", WileyPublications, 2000.

2. D.P.Mukherjee,"FundamentalsofComputerGraphicsandMultimedia",PHI,2001

3. Mayamanuals.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	ParallelComputing	CourseCode	23CSEPH11C15
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. To explain the parallelization of branch-and-bound algorithms.
2. To enable students to demonstrate an understanding of concepts, algorithms, and design principles underlying parallel computing, develop algorithm design and implementation skills, and gain practical experience in programming large-scale parallel machines.

Learning Outcomes

By the end of the course, students will be able to:

1. Explain the major benefits and limitations of parallel computing.
2. Identify and explain the differences between common current parallel architectures.
3. Develop parallel solutions for computationally intensive problems on distributed architectures.
4. Analyze the performance of parallel and distributed solutions.

UNIT1

Parallel and Network Models: The state of computing, multiprocessors and multicomputer, multisector and SIMD computers, architectural development tracks. Program and Network Properties: Conditions of parallelism, program partitioning and scheduling, program flow mechanisms. System Interconnect Architectures. Network properties and routing, static interconnection networks and dynamic interconnection networks, MPI and PVM architecture.

UNITII

Processors and Memory Hierarchy: Advanced processor technology- CISC, RISC, Superscalar, Vector, VLIW and symbolic processors, Memory hierarchy technology, Virtualmemorytechnology(Virtualmemorymodels,TLB,pagingandsegmentation).

Cachememoryorganization,sharedmemoryorganization,sequentialandweak consistency models.

UNITIII

PipeliningandSuperscalartechniques: LinearPipelineProcessors,Nonlinear Pipeline processors, Instruction Pipeline Design, Arithmetic Pipeline Design.

UNITIV

Parallel and Scalable Architecture: Multiprocessors System Interconnects, Cache Coherenceand SynchronizationMechanisms, Vector Processing Principles, MultivectorMultiprocessors and Data Flow Architecture.

Textbook:

1. KaiHwang"AdvancedComputerArchitecture",McGrawHill.

References:

1. J.P.Hayes"ComputerArchitectureandOrganization",McGrawHill.
2. HarveyG.Cragon,"MemorySystemsandPipelinedProcessors",NarosaPublication.
3. V.Rajaranam&C.S.R.Murthy,"ParallelComputers",PHI.
4. R. K. Ghose, RajanMoona&Phalguni Gupta, "Foundation of Parallel Processing", Narosa Publications.
5. KaiHwangand Zu,"ScalableParallelComputersArchitecture",McGraw Hill.
6. StallingW.,"ComputerOrganization&Architecture",PHI.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	Web Engineering	CourseCode	23CSEPH11C16
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

LearningObjectives:

Thegoals of thecourseareas follows:

1. To be able to analyze and design comprehensive systems for the creation, dissemination, storage, retrieval, and use of electronic records and documents.
2. Tolearnandusesomeoftheclientsideandserversidelanguagesusedtomanipulate information on the World Wide Web – i.e. PHP, and Javascript.
3. Tolearntechniquesandevaluationmetricsforensuringtheproperoperability,maintenance and security of a web application.

LearningOutcomes:

Upon successful completion of the course, students will be able to:

1. Develop a web application using server-side programming languages and components.
2. Apply web engineering methodologies for web application development.
3. Develop a component-based web solution and use UML diagrams to describe such a solution.
4. Identify and discuss the security risks of a web application.

UNIT1

Information Architecture: The role of the Information Architect, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites and Intranets, Creating Cohesive Organization Systems Designing Navigation Systems,Types of Navigation systems, Integrated Navigation Elements, Remote Navigation Elements, Designing Elegant Navigation Systems, Searching Systems, Searching your Web Site, Designing the Search Interface, Indexing the Right Stuff, To search or Not To Search, Grouping Content, Conceptual Design, High-Level Architecture Blueprints, Architectural Page Mockups, Design Sketches.

UNITII

Dynamic HTML and Web Designing: HTML Basic Concepts, Good Web Design, Process of Web Publishing, Phases of Web Site development, Structure of HTML documents, HTML Elements-Core attributes, Language attributes, Core Events, Block Level Events, Text Level Events, Linking Basics, Linking in HTML, Images and Anchors, Anchor Attributes, Image maps, Semantic Linking Meta Information, Image Preliminaries, Image Download Issues, Image as Buttons, Introduction to Layout: Backgrounds, Colours and Text, Fonts, Layoutwith Tables. Advanced Layout: Frames and Layers, HTML and other media types. Audio Support in Browsers, Video Support, Other binary Formats. Style Sheets, Positioning with Style sheets. Basic Interactivity and HTML: FORMS, Form Control, New and emergingForm elements.

UNITIII

Java Server Pages and Active Server Pages: Basics, Integrating Script, JSP/ASP Objects and Components, configuring and troubleshooting,: Request and response objects, Retrieving the contents of a an HTML form, Retrieving a Query String, Cookies, Creating and Reading Cookies. Using application Objects and Events.

UNITIV

Overview of advance features of XML: Basics, Integrating Script, Objects and Components, Configuring and troubleshooting, advanced features & their creation and applications, embedding XML with other tools.

TextBooks:

1. HTMLThecompleteReference, TMH
2. CGIProgrammingwithPerl2/e,ScottGuelich,ShishirGundavaram,Gunther Birzniek; O'Reilly
3. DougTidwell,JamesSnell,PavelKulchenko;ProgrammingWebServices with SOAP, O' Reilly
4. Pardi,XMLinAction,WebTechnology,PHI

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	FuzzyLogic	CourseCode	23CSEPH11C17
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. To provide an understanding of the basic mathematical elements of the theory of fuzzy sets.
2. To emphasize the differences and similarities between fuzzy set theory and classical set theory.
3. To cover fuzzy logic inference, with emphasis on its use in the design of intelligent or humanistic systems.
4. To provide a brief introduction to fuzzy arithmetic concepts.
5. To provide insight into fuzzy inference applications in the areas of control and robotics.

Learning Outcomes

At the end of the course, students should be able to:

1. Draw a parallel between crisp set operations and fuzzy set operations using characteristic and membership functions.
2. Define fuzzy sets using linguistic terms and represent these sets by membership functions.
3. Demonstrate familiarity with fuzzy relations and the properties of these relations.
4. Distinguish between binary logic and fuzzy logic at the conceptual level.
5. Explain conditional fuzzy propositions and fuzzy inference systems.
6. Understand the use of fuzzy inference systems in the design of intelligent or humanistic systems.

UNIT1

FuzzyLogic: IntroductiontoFuzzyLogic,ClassicalandFuzzySets:OverviewofClassical Sets,MembershipFunction,Fuzzyrulegeneration.OperationsonFuzzySets:Complement, Intersection, Union, Combinations of Operations, Aggregation Operations.

UNITII

Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations onIntervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations. Fuzzy Logic: Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.

UNITIII

Uncertainty based Information: Information & Uncertainty, Non-specificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets, Bayesian Theory & other uncertainty theories.

UNITIV

Applications & Genetic Algorithms: Application of Fuzzy Logic: Medicine, Economics etc. Genetic Algorithm: An Overview, GA in problem solving, Implementation of GA. Introduction of Neuro-Fuzzy Systems: Architecture of Neuro Fuzzy Networks.

TextBooks:

1. "AnIntroductiontoNeuralNetworks", AndersonJ.A.,PHI,1999.
2. "IntroductiontotheTheoryofNeuralComputation",HertzJ.Krogh,R.G. Palmer, Addison-Wesley, California, 1991.
3. "FuzzySets& FuzzyLogic",G.J.Klir&B.Yuan,PHI,1995.
4. "AnIntroductiontoGeneticAlgorithm",MelanieMitchell,PHI, 1998.

Referencebooks:

1. "Neural Networks-A Comprehensive Foundations", Prentice-Hall International, New Jersey, 1999.
2. "Neural Networks: Algorithms, Applications and Programming Techniques", Freeman J.A. & D.M. Skapura, Addison Wesley, Reading, Mass, (1992).

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	AdvancedNetworkingand Protocols	CourseCode	23CSEPH11C18
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. To build an understanding of the fundamental concepts of computer networking.
2. To familiarize students with the basic taxonomy and terminology of the computer networking domain.
3. To introduce students to advanced networking concepts, preparing them for entry into advanced courses in computer networking.
4. To enable students to gain expertise in specific areas of networking, such as the design and maintenance of individual networks.

Learning Outcomes

After completing this course, students will be able to:

1. Independently understand basic computer network technology.
2. Understand and explain data communication systems and their components.
3. Identify different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP, and explain the function(s) of each layer.
5. Identify different types of network devices and their functions within a network.
6. Understand and build skills in subnetting and routing mechanisms.
7. Demonstrate familiarity with the basic protocols of computer networks and explain how they can be used to assist in network design and implementation.

UNIT1

Review of Basic Concepts: Network Architecture- Protocol Hierarchies, Layeredmodel, Services, Interface, Reference Models,Underlying Technologies, LAN's (Ethernet, Token Ring, Wireless), Point-to-Point WAN's, Switched WAN's (X.25, Frame Relay, ATM).

UNITII

Internet Layer Protocols: IP- Datagram, fragmentation and reassembly, ICP, ICMP Interior and Exterior Routing-RIP, OSPF, BGP, Multicast Routing- Unicast, Multicast and Broadcast, Multicasting.

UNITIII

The Transport Layer: The transport service-Services provided, Service primitives, Sockets, Elements of transport protocols-addressing, connection establishment,connection release, flow control and buffering, multiplexing, crash recovery, UDP- Introduction, Remote Procedure Call, TCP- Service model, Protocol, frame format, connection establishment release, connection management.

UNITIV

The Application Layer: DNS, Telnet and Rlogin, FTP,TFTP,SNMP, SMTP, World Wide Web(Client and Server Side, cookies, wireless web), Java and the Internet, Multimedia (streaming audio, Internet Radio, voice over IP-RTP, video standards) Real time traffic over the internet.

References:

1. BehrouzForouzan,TCP/IPProtocolSuite,SecondEdition,TataMcGraw Hill
2. AndrewSTanenbaum,ComputerNetworks,FourthEcition,PreticeHall
3. Douglas E. Comer, Internetworking with TCP/IP,Vol. 1, Principles,Protocols and Architecture Fifth Edition, Prentice Hall, 2000, ISBN o-13- 018380-6.
4. WilliamStallings,DataandComputerCommunications,SeventhEdition, Pearson Education

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	IntelligentSystems	CourseCode	23CSEPH11C19
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. To describe artificial intelligence (AI) and compare it to conventional computing.
2. To identify the characteristics, structure, benefits, and limitations of expert systems.
3. To describe natural language processing and voice technologies.
4. To describe neural computing and its differences from other computer-based technologies.
5. To define intelligent agents and their role in IT.
6. To describe the relationship between the Web and intelligent systems.

Learning Outcomes

Upon successful completion of the course, students will be able to:

1. Understand a range of techniques of intelligent systems across artificial intelligence (AI) and intelligent agents (IA), from both theoretical and practical perspectives.
2. Apply different AI/IA algorithms to solve practical problems.
3. Design and build simple intelligent systems based on AI/IA concepts.

UNIT1

Introduction: Intelligent Agents – Agents and environments – Good behavior – The nature of environments – structure of agents – Problem Solving – problem solving agents – example problems – searching for solutions – uniformed search strategies –avoiding repeated states – searching with partial information.

UNITII

Searching Techniques: Informed search strategies – heuristic function – local search algorithms and optimistic problems – local search in continuous spaces – online search agents and unknown environments – Constraint satisfaction problems (CSP) – Backtracking search and Local search – Structure of problems – Adversarial Search.

UNITIII

Knowledge Representation: First order logic - syntax and semantics – Using first order logic – Knowledge engineering – Inference – propositional versus first order logic – unificationandlifting–forwardchaining–backwardchaining–Resolution–Knowledge representation.

UNITIV

Learning: Learning from observations – forms of learning – Inductive learning – Learning decision trees – Ensemble learning – Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductivelogicprogramming -Statisticallearningmethods – Learningwith complete data – Learning with hidden variable – EM algorithm – Instancebased learning.

TextBooks:

1. StuartRussell,PeterNorvig,"ArtificialIntelligence–AModernApproach", Second Edition, Pearson Education / Prentice Hall of India, 2004.

References:

1. NilsJ.Nilsson,"ArtificialIntelligence:AnewSynthesis",HarcourtAsiaPvt. Ltd., 2000.
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", Second Edition, Tata McGraw Hill, 2003.
3. GeorgeF.Luger,"ArtificialIntelligence-StructuresAndStrategiesFor Complex Problem Solving", Pearson Education / PHI, 2002.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	InformationProcessingandE-Commerce	CourseCode	23CSEPH11C20
Credits	4	No.of hours/Week	4

Objectives and Outcomes of this course paper

Learning Objectives

1. To identify several advantages of e-commerce.
2. To identify some of the major challenges companies must overcome to succeed in e-commerce.
3. To outline the key components of technology infrastructure required for successful e-commerce.
4. To discuss the key features of electronic payment systems needed to support e-commerce.
5. To identify major issues that represent significant threats to the continued growth of e-commerce.
6. To identify the basic activities and business objectives common to all transaction processing systems.
7. To discuss the importance of business resumption planning and disaster recovery for key transaction processing systems.

Learning Outcomes

Upon successful completion of the course, students will be able to:

1. Recognize the impact of information and communication technologies, especially the Internet, on business operations.
2. Recognize the fundamental principles of e-business and e-commerce.
3. Distinguish the role of management in the context of e-business and e-commerce.
4. Explain the added value, risks, and barriers in the adoption of e-business and e-commerce.
5. Examine applications of e-commerce in relation to applied strategic objectives.
6. Develop and publish webpages using HTML5, CSS3, and JavaScript.
7. Utilize internet tools and services in the development of a virtual e-commerce site.

UNIT1

Compression: Compression & Decompression Techniques – Loosy& Loose less Techniques,Differentformatsofmultimediafilessuchasimages,videosandaudioswill be studied.

UNITII

Algorithms and Analysis: Elementary data Structures and their operations, Basic search and traversal techniques, Divide-Conquer techniques, Greedy method, Branch bound.

UNITIII

Searching & Computing: Cloud Computing: Introduction, Iaas, Paas, Saas, Baas, InternetworkingbetweenClouds.SearchEngineStrategies:Functioning,Makinginformation accessible on net, Getting better rating and preference in search engines.

UNITIV

E-Commerce: Overview of E-Commerce, Benefits of E-Commerce, Impact of E-Commerce, Applications of E-Commerce, Business Models of E-Commerce. Electronic Payment System: Introduction to Payment System, Online Payment System, Pre-paid and Post-paid Payment System. Security in E-Commerce: Transaction Security, Cryptology, Authentication Protocol, Digital Signature.

References:

1. "SecurityTechnologiesforWorldWideWeb",RolfOppliger,Artech House: Inc.
2. "IntroductiontoCryptographywithCodingTheory",WadeTrappe, Lawrence C. Washington, Pearson Education.
3. "NetworkSecurity:CompleteReference",TMH
4. "Compilers:principles,TechniquesandTools",Aho,Lam,Ullman, Pearson Education.
5. P.T.Joseph:E-Commerce-AManagerialPerspective,PHIPublication.
6. Jeffery:IntroductiontoE-Commerce,TMH.
7. Fundamentals of computer algorithms by Horowitz, Ellis; Sahni, Sartaj&Rajasekaran, university Press.
8. Cloud Computing: Web-Based Applications that change the way you work and collaborate By Michael miller.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	InformationHiding Techniques	CourseCode	23CSEPCD20
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

The objectives of this course are to:

1. Understand the fundamentals of cryptography.
2. Acquire knowledge of standard algorithms used to provide confidentiality, integrity, and authenticity.
3. Understand various key distribution and management schemes.
4. Understand how to deploy encryption techniques to secure data in transit across data networks.
5. Design security applications in the field of information technology.

Learning Outcomes

After studying this course, students should be able to:

1. Identify some of the factors driving the need for network security.
2. Identify and classify particular examples of attacks.
3. Define the terms vulnerability, threat, and attack.
4. Identify physical points of vulnerability in simple networks.
5. Compare and contrast symmetric and asymmetric encryption systems and their vulnerabilities to attack, and explain the characteristics of hybrid systems.

UNIT1

Introduction: Introduction to Information Hiding: Types of Information Hiding, Applications, Importance & Significances. Differences between cryptography and steganography, Wisdom from Cryptography, types of steganographytheir application and significances. Past present and future of steganography.

UNITII

Principles of Steganography: Framework for Secret Communication, Security of SteganographySystem, Information Hidingin NoisyData, Adaptive versus non-Adaptive Algorithms, Active and Malicious Attackers, Information hiding in Written Text, Steganographic system, Study of Different methods of insertion and retrieval of message using image steganography, Study of histrogram analysis using MATLAB of original image and stego image.

UNITIII

Watermarking and Copyright Protection: Basics of watermarking, Watermarking process, Watermarking applications, Requirements and Algorithmic Design Issues, Evaluation and Benchmarkingof Watermarking, Bit plane of an Image, studyof noises in stego images and their comparisons, Robustness of watermarking schemes on different attacks like blurring, cropping , compression of the image. PSNR calculation of the images.

UNITIV

Biometrics & Frame proof codes: Use of image steganography in biometricsciences, Study of security enhancement of biometric template using steganographic. Frame proof codes:-Definition, Introduction of frame proof codes, Methods to obtain 2-frameproofcodesusingmutuallyorthogonallatinsquares.Useofframeproofcodes in ownership and software piracy.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	DataModelingandDesign	CourseCode	23CSEPCD21
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Learning Objectives

1. Distinguish between unary, binary, and ternary relationships and give an example of each.
2. Define four basic types of business rules in a conceptual data model.
3. Relate data modeling to process and logic modeling as different views of describing an information system.
4. Explain the role of conceptual data modeling in the overall analysis and design of an information system.

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Install, configure, and interact with a relational database management system (RDBMS).
2. Describe, define, and apply the major components of the relational database model to database design.
3. Learn and apply Structured Query Language (SQL) for database definition and manipulation.
4. Utilize a database modeling technique for a single entity class, a one-to-one (1:1) relationship between entity classes, a one-to-many (1:M) relationship between entity classes, a many-to-many (M:M) relationship between entity classes, and recursive relationships.
5. Define, develop, and process single entity, 1:1, 1:M, and M:M database tables.
6. Learn and implement the principles and concepts of information integrity, security, and confidentiality.
7. Apply ethical computing concepts and practices to database design and implementation.

UNIT1

Conceptual Modelling: Conceptualization and 100% principles, ER, SHM, SHM+ Conversion of conceptual schemas to relational models High and Low CASE tools.

UNITII

Object oriented modelling: Functional modeling, dynamic modeling, and object modeling, Representation of these in UML. Principles of class design: Open closed principle, Liskov's substitution principle, dependency inversion principle.Principles of package design: package cohesion principle, common-reuse principle, common-closure principle, package coupling, stable dependencies principle.

UNITIII

Multidimensional modelling: Facts, dimension, aggregate, star schema, snowflake schema, constellation. Conversion of ER to star schema, Star schema to relational schema, using multi-dimensional data structures.

UNITIV

Structuredsystemsanalysis: Statementofpurpose,contextdiagram,developingprocess hierarchy. Use cases XML, XML schema, XML query.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	StructuredSystemsAnalysis, Designand Testing	CourseCode	23CSEPCD22
Credits	4	No.of hours/Week	4

Objectives and Outcomes of this course paper

Learning Objectives

After going through this course, students should be able to:

1. Define a system and test a system.
2. Explain the different phases of the System Development Life Cycle (SDLC).
3. Enumerate the components of system analysis.
4. Explain the components of system designing.
5. Explain the role of computers in information systems.
6. Explain the characteristics and elements of an information system.
7. Explain various types of information systems and their models.
8. Explain different types of specialized information systems.

Learning Outcomes

Upon successful completion of this course, the student will be able to:

1. Define and describe the five phases of the System Development Life Cycle (SDLC).
2. State at least five expected benefits from systems projects.
3. Explain at least three ways in which information systems support business requirements.
4. Describe how systems analysts interact with users, management, and other information system professionals.
5. Develop data flow diagrams and decision tables.
6. Perform a feasibility study.
7. Evaluate systems development alternatives.
8. Solve realistic systems analysis problems.
9. Determine methods for evaluating the effectiveness and efficiency of a system.
10. Perform testing of the system.

UNIT1

Structured systems design & Principles: Structuring definition, application to realworld phenomena, Data Flow Diagrams, principles of module design, cohesion, coupling.

UNITII

Structured programming languages: Data structuring: need, definition, evolution of data structuring in Fortran, COBOL, Pascal, C Control structuring: need, definition, control structuring in Fortran, COBOL, Pascal, C program structuring: need, side effects, calling conventions and their applications in program structuring.

UNITIII

Testing Structured Systems: Testing life cycle, Notion of a test case, White box testing: statement testing, branch testing, condition testing, basis path, cyclomatic complexity, loop testing, testing recursive programs. Integration testing: top down and bottom up testing, stubs and drivers. Black box testing: domain testing, equivalence class testing, boundary value testing and its different forms, Cause-effect graphs.

UNITIV

Structuredsystemsanalysis: Statementofpurpose,contextdiagram,developingprocess hierarchy. Use cases.

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	InformationTheoryandCoding	CourseCode	23CSEPCD23
Credits	4	No.of hours/Week	4
DurationofEnd termexamination	3 hours	TotalMarks	100 (Th:70andIA:30)
Note: The examiner has to set a total of nine questions (two from each unit and one compulsory question consisting of short answer from all units (one question of four marks from each unit). The candidate has to attempt one question each from each unit along the compulsory question (5 x 14 = 70 marks)			

ObjectivesandOutcomesofthiscoursepaper

Learning Objectives:

1. To equip students with the basic understandingof the fundamental concept of entropy and information as they are used in communications.
2. Toenhanceknowledgeofprobabilities,entropy,measuresofinformation.
3. To guide the student through the implications and consequences of fundamental theories and laws of information theory and coding theory with reference to the application in moderncommunication and computer systems.

LearningOutcomes:

Upon completion of this course, students should be able to:

1. Calculate the information content of a random variable from its probability distribution.
2. Relate the joint, conditional, and marginal entropies of variables in terms of their coupled probabilities.
3. Define channel capacities and their properties using Shannon's Theorems.
4. Construct efficient codes for data transmission over imperfect communication channels.
5. Generalize discrete information theory concepts to continuous signals over continuous channels.

UNIT1

InformationTheory: Marginal,jointandconditionalentropy,informationrate,mutual information, channel capacity of various channels, cascaded channels, repetition of signals.

UNITII

Shannon's theorem: Shannon Hartley theorem, bandwidth- S/N ratio tradeoff, continuous channel, negative entropy.

UNITIII

Coding: Irreducibility,separatibility,codingefficiency,sourceencoding,ShannonFano code, Huffman code, and data compression.

UNITIV

Channel Encoding: Minimumdistance,errordetectionandcorrection,FECandARQ,block code, convolution codes, and cyclic codes, signal error correction, multiple error correction, burst error correction, Cryptography, Encryption and decryption.

References:

1. InformationTheory;F.M Reza;McGraw Hills
2. DigitalandAnalogCommunicationSystems;KSamShanmugam;JohnWiley Communication Systems: Analog and digital; Singh and Sapre; TMH 1995.
3. DigitalCommunication;B.Sklar;PearsonEducationAsia

ProgramName	Ph.D.[CSE] UIET	ProgramCode	
CourseName	FaultTolerant System	CourseCode	23CSEPCD24
Credits	4	No.of hours/Week	4

ObjectivesandOutcomesof thiscourse paper

Objectives and Outcomes of This Course Paper

Learning Objectives

1. Define common terms such as availability, reliability, dependability, etc.
2. Solve reliability block diagrams involving series, parallel, and networks of components, and apply the laws of discrete probability to evaluating systems.
3. Evaluate simple redundancy schemes through the laws of continuous probability, provided the failures are exponentially distributed.
4. Apply fault-tolerance techniques such as error-correcting circuits and duplicate execution to the design of hardware systems.
5. Apply fault-tolerance techniques such as N-version programming and robust data structures to the design of software systems.
6. Evaluate the reliability of systems through fault-injection and simulations.

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Develop an understanding of the fundamental concepts of fault tolerance.
2. Learn basic techniques for achieving fault tolerance in electronic, communication, and software systems.
3. Develop skills in modeling and evaluating fault-tolerant architectures in terms of reliability, availability, and safety.
4. Gain knowledge of sources of faults and methods for their prevention and forecasting.
5. Understand the merits and limitations of fault-tolerant design.

UNIT1

Introduction: Topchallengesfacingthepracticeoffault-tolerances.Definition Dependability, Maintainability, Fault-Error-Failure. Redundancy, Error Detection, Damage Confinement, Error Recovery, Fault Treatment, Passive HW Redundancy, Voting. Fault Prevention - Fault tolerance – anticipated and unanticipated Faults- Test generation for digital systems- Combinational logic.

UNITII

Error models: General coding scheme – Parity checking code- arithmetic code – code for computer memories –checking errors in logical operation – communication coding. Error detection techniques: Watchdog processors, Heartbeats, consistency and capability checking, Data audits, Assertions, Control-flow checking, Error control coding. Application: DHCP Fault tolerance: Coding technique-fault tolerant self checking and fail safe circuits-fault tolerance in combinatorial and sequential circuits- synchronous and asynchronous fail safe circuits. Software fault tolerance: Process pairs, Robust data structures, N version programming, Recovery blocks, Replica consistency & reintegration, Multithreadedprograms Application: VAX.

UNITIII

ExperimentalEvaluation: Networkfaulttolerance:Reliablecommunicationprotocols, Agreementprotocols,Databasecommitprotocols-
Application:DistributedSQLserverCheckpointing&Recovery-
Application:Microcheckpointing,IRIXCheckpoints ExperimentalEvaluation: Modeling and simulation based,Fault injection based- Application: NFTAPE fault injector Modeling for performance, dependability andperformability:dependability-specificmethods(faulttrees,reliabilityblockdiagrams), queues, stochastic Petri nets and stochastic activity networks - Application: UltraSAN.

UNITIV

Practical SystemsforFaultTolerance: Application:Ad-hocwirelessnetwork-Application: NASA Remote Exploration & Experimentation System, Architecture: Fault tolerant computers - general purpose commercial systems-fault tolerant multiprocessor and VLSI based communication architecture. Fault tolerant software: Design-N-version programming recovery block - acceptance tests-fault trees- validation of fault tolerant systems.

References:

1. K.K.Pradhan,“FaultTolerantcomputingtheoryandtechniques”volumeIII.P Hall, 1989.
2. Andersonand Lee,“FaultTolerantprinciplesandpractice”,PHI1989.
3. ParagK. Lala,“FaultTolerantand FaultTestable,Hardwaredesign”PHI1985.
4. LALA,“DigitalsystemsdesignusingPLD’s“,PHI1990.
5. N.N.Biswas, “LogicDesigntheory”,PHI1990.
6. Shem,toyLevei,AshokK.Agarwala,“FaultTolerantSystemdesign”,Tata MG Hill, 1994 V. Nelson, "Fault-Tolerant Computing: Fundamental Concepts".

Annexure AC/6.11

~~Annexure A8~~

Maharshi Dayanand University, Rohtak

(A State University Established Under Haryana Act No. XXV of 1975)
A+ Grade University Accredited by NAAC

No. ACS-I/II/III/2026/ 16320-363
Dated : 30/6/2026

To

1. All the HoDs/ Directors of UTDs/Institutes/Centers,M.D. University, Rohtak
2. Director, MDU-CPAS, Gurugram

Sub:- Amendment in Assessment Mechanism of various Programs under NEP-2020.

Sir/Madam,

In terms of orders passed by competent Authority, following is brought to your notice for further necessary action :-

1. The Formative Assessment Mechanism of UG, PG, PG Diploma, Ph.D Programs and Certificate Courses is rolled back to the previous system of Term End Examinations Mechanism comprising Internal Assessment (30%) and Term End Examinations (70%) except in case of Multidisciplinary and Value Added Courses in UG Programs 2026-27.
2. The aforesaid amendment made in the Formative Assessment shall be implemented in all semesters of UG, PG, PG Diploma, Ph.D Programs and Certificate Courses under NEP-2020 w.e.f. the session 2026-27 including the students admitted in the academic session 2025-26.
3. The reappear cases in Formative Assessment of students admitted in 2025-26, if any, will be allowed for assessment in the same pattern in which he/she appeared in previous semester. For this propose, each such student will have to submit the reappear form as per examination rules.

In light of aforementioned directions, the HoDs/Directors of UTDs/Centres/Institutes are requested to undertake necessary steps for amendments/ updation of Scheme of Examination (SOE) and Syllabi of related UG, PG, PG Diploma, Ph.D. Programs and Certificate Courses.The revised/updated Scheme of Examination (SOE) and Syllabi must be supplied within 15 days from the date of issuing this letter.

This may be treated as most urgent so that the amended/updated SOE/Syllabi are uploaded on the University Website well in time before start of the next Academic Session 2026–27.

30/6/26

Assistant Registrar (Academic)
for REGISTRAR

Endst. No. ACS-I/II/III/2026/ 16364-564 **Dated:** 30/6/2026

Copy of the above is forwarded to the following for information and necessary action :-

1. Deans of Faculties, M.D. University, Rohtak
2. Director, MDU-CPAS, Gurugram
3. Director, CCDD, M.D. University Rohtak
4. Controller of Examinations, M.D. University, Rohtak
5. Director, IQAC, M.D. University, Rohtak
6. Director, University Computer Centre, M.D. University, Rohtak
7. All Principals/Directors of the Colleges/Institutes affiliated to M.D. University, Rohtak
8. Deputy/Assistant Registrar (Secrecy/Conduct/Result-I,II,III,IV), M.D. University, Rohtak.
9. OSD/PA to the Vice-Chancellor/Dean Academic Affairs/Registrar (for kind information to the Vice-Chancellor/Dean Academic Affairs/Registrar) M.D. University, Rohtak.

30/6/26

Assistant Registrar (Academic)
for REGISTRAR

SOE & SYLLABI

of

Doctor of Philosophy Course Work in Management

(Ph.D.)

(Based on National Education Policy- 2020)

WITH EFFECT FROM THE ACADEMIC SESSION 2026-27

MAHARSHI DAYANAND UNIVERSITY ROHTAK (HARYANA)

Scheme of Examinations for Ph.D. Course Work (Management)

(Academic Session 2025-2026)

Program Outcomes (PO)

PO1: Scholars would be able to demonstrate the ability to acquire skills to perform independent advanced research.

PO2: Demonstrate ability to identify and seek out resources and information; apply these to guide research plan development.

PO3: Demonstrate the ability to master and/ or innovate research methodologies, and techniques.

PO4: Scholars would be able to make an original and substantial contribution to the knowledge.

PO5: Demonstrate independent thinking and creativity.

Program Specific Outcomes (PSO)

PS01: To educate the students about how to select a research topic.

PS02: To instruct the students about how to write a literature review and to inform the students about in-depth understanding of Research Methodology as well as to facilitate them to carry out research in a systematic manner.

PS03: To educate the students about importance of quantitative and qualitative techniques used in research.

PS04: Develop and execute original research plan(s).

PS05: Ability to produce publishable research articles/ documents/ reports in the field of public policy and corporate world. Students would be successful entrepreneurs as well.

Ph.D. Course Work in Management (MGTPH)
Duration: One Semester (Six months)
Total Credit requirement: 12 credits

Program Structure (Ph.D. in Management)

Course Code	Nomenclature of Course	Theory Marks (End Semester Examination)	Internal Assessment Marks	Max. Marks	Hours / Week	Credits
23MGTPH11C1	Research Methodology	70	30	100	4	4
23MGTPH11C2	Quantitative Techniques and Computer Applications	70	30	100	4	4
23MGTPH11C3	Time-Series and Panel Data Econometrics	35	15	50	2	2
23CCPH11C1	Research and Publications Ethics	35	15	50	2	2
Total Marks/ Credits				**300**		**12**

Note:

1. The compulsory course on 'Research and Publication Ethics' shall be offered by Ch. Ranbir Singh Institute of Social and Economic Change for all UTDs/ Centres/ Institutes passed vide Resolution No. 27 of the 271st meeting of EC held on 29.7.2020.
2. As per Letter No. ACS-I/II/III/2026/16320-363 dt. 30.6.2026 the formative assessment is rolled back to the previous system of Term-End Examinations Mechanism in Ph.D. Course Work w.e.f. session 2026-27.
3. Written examinations in the papers Research Methodology (23MGTPH11C1), Quantitative Techniques & Computer Applications (23MGTPH11C2), Time-Series and Panel Data Econometrics (23MGTPH11C3), Research and Publications Ethics (23CCPH11C1) shall be held at the term end of the course. The question paper in each subject shall be set by an examiner to be appointed by the Chairman, P.G.B.O.S. in Management based on the syllabus prescribed.
4. Internal assessment in each of the papers Research Methodology (23MGTPH11C1), Quantitative Techniques & Computer Applications (23MGTPH11C2), Time-Series and Panel Data Econometrics (23MGTPH11C3), Research and Publications Ethics (23CCPH11C1) shall be awarded by the teacher concerned as prescribed under ordinance by the Maharshi Dayanand University, Rohtak for various P.G. Programmes.
5. Each student in the Ph.D. course work shall be assigned to a teacher on the basis of specialization/ interest area with teacher's consent.
6. As per the MDU Ordinance for Degree of Doctor of Philosophy (Ph.D.) w.e.f. 2025-26 Session, A Ph.D. scholar must obtain a minimum of 55% marks or its equivalent grade in the UGC 10-point scale in the course work to be eligible to continue in the program and submit his or her thesis.

Ph.D. Course Work Syllabus

Name of the Program	Ph.D. Course work in Management	**Program Code:**	MGTPH
Name of the Course	Research Methodology	**Course Code**	23MGTPH11C1
Hours/ week	4 Hours	**Credits**	4
Theory Marks	70 Marks	**Internal Assessment Marks**	30 Marks
Max. Marks	100	**Time**	3 Hours

Instructions for External Examiner: The question paper shall be divided into two sections. Section 'A' shall comprise **SEVEN** short answer type questions from the whole of the syllabus carrying **TWO** marks each, which shall be compulsory. The answer to each question should not exceed 50 words normally. Section 'B' shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Course Objectives

1. Students would understand a general definition of research design.
2. Students would know the importance of academic research.
3. Students would be able to identify the overall process of designing a research study from its inception to its report.
4. Students would be familiar with ethical issues in academic research, including those issues that arise in using quantitative and qualitative research.
5. Students would know the primary characteristics of quantitative research and qualitative research.

Course Outcomes

After completing the course, students would be able to:

1. Identify and discuss the role and importance of research in different functional areas of Management.
2. Identify and discuss the complex issues inherent in selecting a research problem and hypothesis formulation.
3. Select an appropriate research design.
4. Write a research report and thesis.
5. Write a research proposal (for grants).

UNIT- I

Meaning, types and significance of research in business; characteristics of good research; identification and formulation of research problems; setting research objectives; hypothesis: Meaning, types, need and formulation; importance and format of review of literature.

UNIT- Il

Business research design: exploratory, descriptive & causal studies; population & sample; meaning and types of sampling; sample size; sampling error; the research proposal.

UNIT- III

Measurement & scaling techniques: nominal scale, ordinal scale, interval scale, ratio scale; criteria for good measurement; attitude measurement- Likert's scale, Semantic Differential scale, Thurston-equal appearing interval scale, Multi-Dimensional scaling; meaning and types of data; data collection methods- observation, survey and interview; questionnaire design; reliability and validity of questionnaire.

UNIT- IV

Editing, coding, classification and tabulation of data; Methods of data presentation; interpretation of results; report writing- purpose, steps and format of research report; final presentation of the research report; idea of referencing, bibliography, footnotes and end notes.

References

1. Cooper, D. R., & Schindler, P. S. (2014). Business Research Methods. McGraw-Hill.
2. Churchill, G. A., & Lacobucci, D. (2006). Marketing Research: Methodological Foundations. New York: Dryden Press.
3. McBurney, D. H., & White, T. L. (2010). Research Methods. Wadsworth Cengage Learning.
4. Wilkinson, T. S., & Bhandarkar, P.L. (2016). Methodology & Techniques of Social Research. Himalaya Publishing House.
5. Kothari, C. R. (2017). Research Methodology Methods and Techniques (2nd ed.). New Age International.
6. Krishnaswami, O. R. (2000). Research Methodology in Social Sciences, Delhi: Himalaya Publications.
7. Kumar, Renjith (2009). Research Methodology: A Step by Step Guide for Research, Delhi: Pearson Education.

Ph.D. Course Work Syllabus

Name of the Program	Ph.D. Course work in Management	**Program Code:**	MGTPH
Name of the Course	Quantitative Techniques and Computer Applications	**Course Code**	23MGTPH11C2
Hours/ week	4 Hours	**Credits**	4
Theory Marks	70 Marks	**Internal Assessment Marks**	30 Marks
Max. Marks	100	**Time**	3 Hours

Instructions for External Examiner: The question paper shall be divided into two sections. Section 'A' shall comprise **SEVEN** short answer type questions from the whole of the syllabus carrying **TWO** marks each, which shall be compulsory. The answer to each question should not exceed 50 words normally. Section 'B' shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Course Objectives

1. Explain and discuss the researcher's work (model).
2. Elucidate basic statistical concepts and tests used in academic research.
3. Demonstrate their competence and confidence in using inferential statistics in general and to the use of significance testing in particular.
4. Understand and master the handling of data and employ proper analyses.
5. Use output derived from statistical procedures and converts such output to understandable statement.

Course Outcomes

After completing the course, students would be able to:

1. Identify and discuss the role and importance of quantitative techniques in different functional areas of management.
2. Select an appropriate statistical technique.
3. Understand bivariate and multivariate data analysis.
4. Use different statistical software like SPSS, E-Views etc.
5. Analyze and interpret the results for their thesis/ publications of a research article.

UNIT- I

Descriptive and Inferential Statistics, Statistical tools for Data analysis- Uni-variate, Bi-Variate & Multivariate analysis, Hypothesis testing, parametric tests: t-test, z-test and F-test, Significance of non-parametric tests (Chi-square test, Kruskal-Wallis H test, Mann-Whitney U-test)

UNIT- Il

Analysis of Variance (ANOVA), Analysis of Covariance (ANCOVA), Multivariate analysis of variance (MANOVA), Multivariate analysis of covariance (MANCOVA)

UNIT- III

Correlation Analysis, Simple Linear Regression Analysis, Multiple Linear Regression Analysis, Regression with Dummy Variables, Logistic Regression

UNIT- IV

Discriminant Analysis, Exploratory and Confirmatory Factor Analysis, Structural Equation Modeling, Path Analysis

Note: Students are required to use statistical software's like SPSS, AMOS, E-Views, RStudio, Stata, Minitab etc. while carry out multivariate techniques.

References

1. Malhotra, N. K., & Dash, S. (2016). Marketing Research: An Applied Orientation. Pearson.
2. Gujarati, D. N. (2009). Basic Econometrics. Tata McGraw-Hill Education.
3. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. (2006). Multivariate Data Analysis: Pearson Education. New Jersey: Hoboken.
4. Chandan, J. S. (2009). Statistics for Business and Economics. Vikas Publishing House.
5. Gupta, S. P., & Gupta, M. P, (2007), Business Statistics. Sultan Chand and Sons. New Delhi.

Ph.D. Course Work Syllabus

Name of the Program	Ph.D. Course work in Management	**Program Code:**	MGTPH
Name of the Course	Time-Series and Panel Data Econometrics	**Course Code**	23MGTPH11C3
Hours/ week	2 Hours	**Credits**	2
Theory Marks	35 Marks	**Internal Assessment Marks**	15 Marks
Max. Marks	50	**Time**	3 Hours

Instructions for External Examiner: The question paper shall be divided into two sections. Section 'A' shall comprise **SEVEN** short answer type questions from the whole of the syllabus carrying **ONE** marks each, which shall be compulsory. The answer to each question should not exceed 50 words normally. Section 'B' shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Course Objectives

1. To learn the basic characteristics of time series data
2. To learn the basic characteristics of [panel data
3. Provides a comprehensive knowledge to do empirical work with financial data measuring volatility in financial time series
4. To learn econometric techniques for time series and panel data
5. To learn econometric modeling with real world data and do economic forecasting

Course Outcomes

After completing the course, students would be able to:

1. Understand basics of econometric modeling.
2. Understand Time Series Econometrics.
3. Understand about the Panel data.
4. Conduct empirical applications of financial and economic theory based on real financial data using statistical/ econometric techniques.
5. Use Panel data for financial modeling.

UNIT- I

Stochastic Processes, Non-stationary time series, Tests of Stationarity, Unit Root Test, Transforming Nonstationary Time Series, Structural Breaks in Time Series

UNIT- Il

Vector Autoregressive Model, Vector Error Correction Model, Autoregressive Distributed Lag (ARDL) Model

UNIT- III

Cointegration: Engle-Granger two-step method and Johansen test, ARMA model, ARIMA model

UNIT- IV

Introduction to Panel Data Models: Pooled OLS, Fixed Effects Model, Random Effects Model Unbalanced Panel Data Models

References

1. Gujarati, D. N. (2009). Basic Econometrics. Tata McGraw-Hill Education.
2. Brooks, C. (2019). Introductory Econometrics for Finance. Cambridge University Press.
3. Wooldridge, J. M. (2010). Econometric Analysis of Cross Section and Panel Data. MIT press.
4. Arellano, M. (2003). Panel Data Econometrics. Oxford University Press.
5. Pesaran, M. H. (2015). Time Series and Panel Data Econometrics. Oxford University Press.

Ph.D. Course Work Syllabus

Name of the Program	Ph.D. Course work in Management	**Program Code:**	MGTPH
Name of the Course	Research and Publications Ethics	**Course Code**	23CCPH11C1
Hours/ week	2 Hours	**Credits**	2
Theory Marks	35 Marks	**Internal Assessment Marks**	15 Marks
Max. Marks	50	**Time**	3 Hours

Instructions for External Examiner: The question paper shall be divided into two sections. Section 'A' shall comprise **SEVEN** short answer type questions from the whole of the syllabus carrying **ONE** marks each, which shall be compulsory. The answer to each question should not exceed 50 words normally. Section 'B' shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Course Objectives

1. To aware the students about basics of philosophy of science and ethics
2. To educate the students about research integrity and publication ethics.
3. To vigilant the students about research misconduct and predatory publications.
4. To inform the students about indexing and citation databases, open access publications
5. To inform the students about research metrics (citations, h-index, Impact Factor, etc.) and plagiarism tools.

Course Outcomes

After completing the course, students would be able to:

1. Understand about the publication ethics and publication misconducts.
2. Aware about falsification, fabrication, and plagiarism.
3. Use Citation databases and understand about impact factor of journal.
4. Use plagiarism software like Turnitin.
5. Identify Predatory publishers and journals.

UNIT- I

Introduction to philosophy: definition, nature and scope, concept, Branches; Ethics: definition, moral philosophy, nature of moral judgments and reactions; Ethics with respect to science and research.

UNIT- Il

Intellectual honesty and research integrity; Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP); Redundant publications: duplicate and overlapping publications, Salami Slicing; Selective reporting and misrepresentation of data.

UNIT- III

Citation databases: Web of Science, Scopus; Open access publications and initiatives; Publication ethics: definition, introduction and importance; Best practices/ standards setting initiatives and guidelines: COPE, WAME, etc.

UNIT- IV

Conflicts of interest; Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa; Violation of publication ethics, authorship and contributorship; Identification of publication misconduct, complaints and appeals; Predatory publishers and journals.

Note: The internal assessment will be based on the discussion/ presentation/ class participation/ quizzes/ assignments from the topics: Open Access Publishing, SHERPA/ RoMEO online resource to check publisher copyright & self-archiving policies, Journal finder (like JANE, Elsevier Journal Finder), Publication Misconduct, Databases (Web of Science, Scopus etc.), Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, Cite Score, Metrics: h- index, g index, i10 index, altmetrics, Use of plagiarism software like Turnitin, Urkund and other open source software tools etc.

References

1. Graf, C., Wager, E., Bowman, A., Fiack, S., Scott-Lichter, D., & Robinson, A. (2007). Best Practice Guidelines on Publication Ethics: A Publisher's Perspective. International journal of clinical practice, 61, 1-26.
2. Wager, E. (2012). The Committee on Publication Ethics (COPE): Objectives and Achievements 1997-2012. La Presse Medicale, 41(9), 861-866.
3. Shamoo, A. E., & Resnik, D. B. (2009). Responsible Conduct of Research. Oxford University Press.
4. Resnik, D. B., Patrone, D., & Peddada, S. (2010). Research Misconduct Policies of Social Science Journals and Impact Factor. Accountability in research, 17(2), 79-84.
5. Resnik, D. B. (2011). What is Ethics in Research & Why is it Important. National Institute of Environmental Health Sciences, 7(10), 49-70.

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Estd. 2008

GANGA INSTITUTE OF TECHNOLOGY & MANAGEMENT

AN AUTONOMOUS INSTITUTE | GRADED 'A' BY NAAC

Approved by AICTE and Recognized under section 2 (f) of UGC Act, 1956
Affiliated to M. D. University, Rohtak



A GRADE ACCREDITED BY NAAC
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18+ Years of Excellence in Education

PROSPECTUS 2026-27

FOR ADMISSION TO

Ph.D. Programs being offered by the Institute

www.gangainstitute.com

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT

VISION

GITAM aims to be an outstanding Institute in India through academic excellence in the field of Technology and Management to fulfill the need of the Industry and serve the society.

Mission

- To provide healthy environment to our students as well as faculty members.
- To achieve excellence in technical education.
- To promote holistic development of students through interaction with Alumni, Academia, Industry and Expert Lectures.
- To attract, nurture and retain the best faculty and technical manpower.
- To promote research and development Initiatives.
- To contribute to the society by inculcating professional ethics in the students.

Quality Policy

GITAM is committed to be a learning organization which shall not rest on its achievements and shall upgrade itself in terms of knowledge, attitude and skills for the holistic development of its students and staff.

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Dr. Sushil Kumar Gupta
Chairman

MESSAGE FROM THE CHAIRMAN

It is a matter of immense pride and strategic celebration that Ganga Institute of Technology & Management (GITAM) has introduced its Ph.D. programmes starting from the academic session 2026–27. This milestone represents a transformative expansion in our foundational vision to empower minds and cultivate high-caliber intellectual progress within the region.

As an autonomous educational institution, our continuous objective has been to build an atmosphere where academic rigor aligns perfectly with deep industrial and social transformation. By opening our doors to doctoral research, we are creating a dedicated platform for future visionaries, industry leaders, and research specialists to address complex global challenges.

We are completely dedicated to equipping our scholars with state-of-the-art infrastructure, advanced technological laboratories, and exceptional professional networks. I warmly welcome the incoming cohort of Ph.D. scholars and encourage them to pioneer innovations that leave a lasting imprint on societal progress.

Dr. Sushil Kumar Gupta

Chairman
Ganga Institute of Technology and Management, Kablana



Sh. Bharat Gupta
Vice-Chairman

MESSAGE FROM THE VICE-CHAIRMAN

I am absolutely delighted to share my heartfelt congratulations to the entire academic team, faculty, and stakeholders of Ganga Institute of Technology and Management on the formal introduction of our Ph.D. programmes for the session 2026–27. Becoming a center for doctoral studies cements our standing as a premium institution for advanced professional engineering and management studies.

Research forms the structural backbone of progress, and at GITAM, we aim to establish a vibrant research landscape. Our autonomy allows us to create structured pathways that bridge fundamental academic research with practical, real-world industry problem solving, making our scholars competitive on a global level.

We look forward to seeing our doctoral departments transform into active intellectual hubs that contribute patents, research papers, and technical projects to the global engineering landscape. I wish all the selected research scholars a highly productive, innovative, and successful academic journey with us.

Sh. Bharat Gupta

Vice-Chairman
Ganga Institute of Technology and Management



Prof. Aman Aggarwal
Director

MESSAGE FROM THE DIRECTOR

It brings me extreme professional fulfillment to welcome you to the Ph.D. Programme framework at Ganga Institute of Technology & Management for the academic session 2026–27. The formal approval to run independent doctoral streams highlights our institute's academic matureness, high faculty standards, and robust infrastructure.

The Ph.D. programmes at GITAM will operate strictly in accordance with the Ph.D. Ordinance of our Institute, which has been meticulously prepared in line with the applicable ordinance framework of M.D. University, Rohtak, alongside the national regulatory guidelines for offering advanced Ph.D. research programmes. This guarantees that our scholars receive a degree that combines local institutional agility with long-standing university validation.

Our institutional focus centers around cross-functional collaboration, active experimentation, and high-impact scholarship. With our modern labs, extensive library archives, and highly accomplished doctoral supervisors, we offer an ideal ecosystem for researchers. I invite bright and dedicated minds to join our regular doctoral streams and advance the frontiers of knowledge.

Prof. Aman Aggarwal

Director
Ganga Institute of Technology & Management

OFFICERS OF THE INSTITUTE

Chairman
Dr. Sushil Kumar Gupta

Vice- Chairman
Sh. Bharat Gupta

Director
Prof. (Dr.) Aman Aggarwal

Registrar
Dr. Vivek Kumar

Convener R & D Cell
Dr. Nitin Kumar

Associate Controller of Examination
Dr. Jitender Kumar

Convener, Academic Committee
Mr. Vivek

Convener, Anti- Ragging Committee
Dr. Rakesh Kumar Joon

Chief Warden, Boys and Girls Hostels
Dr. Joginder Singh

Head Librarian
Dr. Sombir

IQAC Coordinator
Dr. Jitender Kumar

Controller of Examinations
Dr. Vivek Kumar

Associate Controller of Examination
Dr. Hitanshu Saluja

Coordinator Admission Committee
Dr. Joginder Singh

Convener, ICC
Dr. Punam Devi

Finance Officer
Ms. Divya Rani

Coordinator, Scholarship Cell
Dr. Vinod Kumar

HEADS OF DEPARTMENTS

S. No.	Name of the Department	Name of the Head	Mobile No., E-mail Id
1	Electrical Engineering	Dr. Joginder Singh	9654292946, hod.ee@gangainstitute.com
2	Electronics & Communication Engineering	Dr. Rakesh Kumar Joon	8684000767, hod.ece@gangainstitute.com
3	Computer Science & Engineering	Dr. Nitin Kumar	8684000893, hod.cse@gangainstitute.com
4	Fire Technology and Safety	Dr. Jitender Kumar	8684000892, hod.fts@gangainstitute.com
5	Mechanical Engineering	Mr. Vivek	8684000891, hod.me@gangainstitute.com
6	Civil Engineering	Ms. Sheela Malik	9896275296, hod.civ@gangainstitute.com
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8	Computer Science & Applications	Dr. Anil Chhilar	9466350772, hod.ca@gangainstitute.com
9	Applied Sciences	Dr. Anurag Jain	8076304041, hod.as@gangainstitute.com
10	Business Studies	Dr. Dipika	8684000895, hod.bs@gangainstitute.com
11	Bachelor of Computer Applications	Dr. Parveen Kumari	9466724124, hod.bca@gangainstitute.com

KEY DATES FOR ADMISSION TO Ph.D. PROGRAM

Schedule for submission of application for Conduct of Interview and Counselling for UGC NET Category-1, 2, 3 and the Candidates who qualified the Common Ph.D. Entrance Test Conducted by MDU, Rohtak.

Schedule	Date
Opening Date of Registration	25-11-2026
Last date for submission of application form	15-12-2026
Conduct of Interview	To be notified
Display of tentative merit list	To be notified
Counseling	To be notified
Display of Vacant seats, If any	To be notified

IMPORTANT INSTRUCTIONS FOR CANDIDATES

The candidates must note the following points while seeking admission to the programmes offered by the Institute:

1. **Submission of Relevant Documents:** Candidates must attach all relevant documents, including the marksheet of the qualifying examination, proof of age, and other required documents, along with the application form. In the absence of the marksheet of the qualifying examination, the candidate's application shall not be considered while preparing the merit list.

2. **Incomplete or Incorrect Applications:** Incomplete or incorrectly filled application forms shall be rejected summarily.

3. **Conversion of CGPA into Percentage:** Wherever applicable, candidates must upload the conversion formula for converting CGPA into percentage. Candidates are required to enter the percentage of marks obtained in each examination using the prescribed conversion formula, wherever applicable.

List of Documents to be uploaded for admission to Ph.D. programs

1. Matriculation Certificate (as proof of age)
2. Senior Secondary Examination Certificate
3. Detailed Marks Card (DMC) of the qualifying examination (UG & PG)
4. UGC/CSIR NET Score Card/ Entrance Test Result of MDU, Rohtak and Certificate, wherever applicable
5. Character Certificate from the Institute last attended
6. Haryana resident certificate, if applicable.

CHAPTER -I

ABOUT INSTITUTION

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT (GITAM) KABLANA, JHAJJAR, HARYANA

1. About the Institution

Ganga Institute of Technology and Management (GITAM), established in 2008, is located at Kablana, Jhajjar, Haryana, in the Delhi-NCR region. Established under the aegis of Pawan Ganga Educational Society, GITAM is committed to providing quality, affordable and accessible higher education, promoting academic excellence, encouraging research and innovation, and developing competent professionals equipped to meet the changing needs of society and industry.

GITAM is affiliated with Maharshi Dayanand University (MDU), Rohtak, and offers programmes in accordance with applicable University regulations and approvals of the relevant statutory and regulatory authorities. The Institute is recognized under Section 2(f) of the University Grants Commission (UGC) Act, 1956, and has been accredited with an 'A' Grade by the National Assessment and Accreditation Council (NAAC), as stated in the institutional profile.

GITAM forms part of the wider Ganga Group of Institutions, which has established an educational presence across the Delhi-NCR region through professional programmes in Engineering, Management, Architecture, Computer Applications and Education.

2. Autonomous Status Conferred by UGC and MDU, Rohtak

Ganga Institute of Technology and Management (GITAM), Kablana, Jhajjar, Haryana, has been granted autonomous status for a period of ten years, from the academic year 2024–25 to 2033–34, under the UGC (Conferment of Autonomous Status Upon Colleges and Measures for Maintenance of Standards in Autonomous Colleges) Regulations, 2023.

The University Grants Commission, through Letter No. F.2-10/2023 (AC-Policy) dated July 2024, communicated approval of the recommendation of the Standing Committee on Autonomous Colleges to confer autonomous status upon GITAM for the said ten-year period. Pursuant to the UGC communication, Maharshi Dayanand University, Rohtak, issued Notification No. CB-II/164/2024/14916–34 dated 5 September 2024, conferring autonomous status on the Institute for the academic years 2024–25 to 2033–34, subject to the conditions prescribed by the University, the UGC and applicable regulations.

Autonomy enables the Institute to exercise the academic and administrative responsibilities permitted under the applicable UGC Regulations, while remaining subject to the conditions imposed by the University and statutory authorities. The Institute is required to comply with

the UGC Regulations, maintain prescribed academic standards, and establish and operate the required examination cell and statutory bodies.

For the Ph.D. programme, admission, eligibility, research supervision, coursework, progress monitoring, thesis submission, evaluation, viva voce and award of the degree shall be governed by the applicable MDU ordinances and regulations, UGC regulations and other statutory requirements. The Institute's autonomous status does not, by itself, mean that it independently awards Ph.D. degrees.

3. Academic Excellence and Industry-Aligned Learning

GITAM strives to integrate theoretical knowledge with practical application, industry exposure and emerging technological developments. Its educational approach emphasizes analytical thinking, problem-solving, creativity, professional responsibility and lifelong learning.

- Curriculum delivery in accordance with applicable academic regulations.
- Continuous improvement in teaching-learning practices.
- Practical training, laboratory work and project-based learning.
- Industry interaction and exposure to emerging technologies.
- Faculty development and professional advancement.
- Research, innovation, entrepreneurship and interdisciplinary learning.

4. Industry, Skill Development and Entrepreneurship

The Institute promotes experiential learning and industry-oriented skill development through academic departments, laboratories, training initiatives and industry interactions. Its institutional profile identifies the Ganga Centre for Skill and Entrepreneurship Development (GCSED) as an initiative to strengthen the relationship between academia, industry and entrepreneurship.

The stated technology ecosystem includes Dassault Systèmes, PTC, Mastercam and Ansys, subject to the applicable collaboration and programme arrangements. Activities may include practical training, industry-linked projects, problem-solving, entrepreneurship development and incubation support.

5. Research, Innovation and Entrepreneurship

GITAM recognizes research and innovation as important components of higher education. The Institute encourages original thinking, academic inquiry, research integrity, responsible scholarship and the development of practical solutions to real-world problems.

- Encouraging original thinking and independent inquiry.
- Promoting research integrity, academic honesty and ethical conduct.
- Supporting innovation, technology development and entrepreneurship.
- Encouraging faculty-student collaboration in research activities.
- Promoting scholarly dissemination through appropriate academic channels.
- Encouraging participation in seminars, conferences and research-oriented events.

Doctoral research shall be carried out in accordance with applicable MDU regulations, prescribed research procedures, ethical requirements and facilities available for the approved research area.

6. Student Support and Welfare Systems

GITAM recognizes that student development extends beyond classroom instruction. The Institute seeks to provide a supportive, inclusive and student-friendly environment through academic guidance, welfare services, career development and appropriate grievance-redressal mechanisms.

6.1 Academic Guidance and Mentoring

Faculty members and designated academic coordinators may guide students regarding course requirements, academic progress, projects, research activities and professional development. Doctoral scholars shall receive guidance within the approved research supervision and monitoring framework prescribed by MDU.

6.2 Counselling and Personal Support

The Institute recognizes the importance of personal well-being and adjustment to academic life. Appropriate counselling and guidance mechanisms may assist students in addressing academic stress, personal difficulties and other concerns affecting their educational experience.

6.3 Career Guidance and Placement Support

Career-related initiatives may include aptitude and communication training, interview preparation, technical skill development, industry interaction, placement guidance and entrepreneurship awareness.

6.4 Scholarships and Financial Assistance

Information regarding scholarships, fee concessions and other financial assistance schemes, wherever applicable, may be obtained through the prescribed institutional or government channels. Availability and approval are subject to the rules of the respective schemes and decisions of competent authorities.

6.5 Library and Learning Resources

Library and learning resources support teaching, learning, assignments and research. Students are encouraged to use available books, reference materials, digital learning resources and other academic facilities. Access to electronic journals and databases is subject to subscription and institutional access arrangements.

6.6 Equal Opportunity and Inclusive Campus

The Institute seeks to promote a respectful and inclusive academic environment. Student concerns relating to discrimination, accessibility or other welfare matters may be raised through the designated institutional channels, in accordance with applicable provisions.

6.7 Sports, Cultural and Co-Curricular Activities

Sports, cultural events, technical competitions, seminars, workshops and other co-curricular activities encourage teamwork, leadership, discipline, communication and interpersonal skills.

7. Transparent and Fair Examination System

GITAM recognizes transparency, fairness, confidentiality and accountability as essential principles of examination and evaluation. Examination-related activities are to be conducted in accordance with applicable ordinances, academic regulations and notified procedures.

- Examination schedules, instructions and relevant academic notices are communicated through prescribed channels.
- Assessment and evaluation follow the applicable assessment scheme and Institute procedures.
- Examination materials, marks, results and academic records are handled through appropriate procedures to maintain confidentiality and accuracy.
- Students may raise examination-related concerns through prescribed representation, verification, re-evaluation or grievance procedures, wherever applicable.
- Academic and examination authorities are responsible for adherence to notified rules and procedures.
- Students are expected to comply with examination rules and maintain academic honesty.

For Ph.D. scholars, coursework examinations, research progress reviews, thesis evaluation, viva voce and other doctoral assessment requirements shall be governed by the applicable Ph.D. ordinances and regulations.

8. Digital Infrastructure and Information Technology

The Institute emphasizes information and communication technology in academic and administrative activities. The Institute's stated internet bandwidth is up to 1 Gbps, subject to the applicable service configuration and operational availability. Such connectivity supports digital learning, access to online academic resources, communication and other internet-enabled educational requirements.

- Access to online learning materials and digital academic resources.
- Internet-enabled teaching, presentations and academic communication.
- Use of digital tools for assignments, projects and research-related work.
- Access to online journals and scholarly information, where subscribed or otherwise available.
- Digital communication among students, faculty members and administrative offices.

9. Institutional Committees and Grievance Redressal

GITAM recognizes the importance of accountability, student welfare, academic discipline, equal opportunity and a safe campus environment. Committees and designated authorities are constituted and operate in accordance with applicable statutory requirements, University

regulations and institutional orders. The following descriptions refer to mechanisms applicable as constituted by the Institute; only currently constituted committees should be listed in the final prospectus.

Internal Complaints Committee (ICC)

Addresses complaints relating to sexual harassment in accordance with applicable law and prescribed procedures, and supports a safe and dignified environment.

Anti-Ragging Committee and Anti-Ragging Squad

Support prevention of ragging, awareness of applicable regulations and response to reported incidents.

Student Grievance Redressal Committee

Provides a designated mechanism for eligible student grievances relating to academic, administrative and other student matters.

Equal Opportunity and SC/ST Welfare Mechanisms

Support fairness, equal access and non-discrimination through designated institutional channels and applicable procedures.

Internal Quality Assurance Cell (IQAC)

Supports quality enhancement, review of institutional practices, feedback analysis and continuous improvement.

Academic and Examination Committees

Support academic administration, examination procedures and adherence to applicable regulations.

Research and Ethics-Related Bodies

Handle research-related matters within the scope assigned under applicable University regulations and institutional arrangements.

Discipline and Student Welfare Committees

Address matters relating to student conduct, campus discipline, welfare and a conducive educational environment.

Other statutory and institutional committees

Committees relating to accessibility, disability support, library services, sports, cultural activities, environmental initiatives and campus safety may operate as required by regulations and institutional needs.

The Institute seeks to communicate committee details, reporting channels and applicable procedures through appropriate institutional notices and information resources.

10. Student Feedback and Continuous Improvement

Student feedback and review mechanisms, wherever implemented, help assess teaching-learning practices and institutional services. The Institute seeks to use appropriate feedback processes to improve academic delivery, student support, infrastructure and administrative responsiveness.

11. Placements, Achievements and Institutional Recognition

GITAM places emphasis on professional competence, practical training, innovation and career development. Its institutional profile reports recognition in engineering and management rankings, participation in innovation competitions, patents associated with faculty members and students, and academic achievements. Specific rankings, awards, patent figures and programme accreditations should be retained in the prospectus only after verification against the relevant published records.

The Institute's profile highlights a B.Tech. programme in Fire Technology and Safety Engineering, with focus areas including fire safety systems, risk assessment, industrial safety and disaster management.

12. Global Outlook and Alumni Network

GITAM seeks to prepare students to participate in a competitive and interconnected world. Its educational approach emphasizes adaptability, ethical conduct, innovation, communication and the ability to respond to emerging professional and societal challenges.

13. Why Choose GITAM?

- Academic programmes delivered in accordance with applicable University regulations and approvals.
- Practical learning, skill development and industry exposure.
- Initiatives promoting research, innovation and entrepreneurship.
- Digital connectivity and technology-enabled learning.
- Student guidance, welfare and grievance-redressal mechanisms.
- Examination and assessment procedures governed by applicable regulations.
- Opportunities for technical, cultural, sports and co-curricular participation.
- Institutional mechanisms supporting discipline, equal opportunity and campus safety.
- Focus on employability, professional ethics and lifelong learning.

14. A Conducive Environment for Doctoral Research

GITAM recognizes doctoral research as an important avenue for developing advanced knowledge, critical inquiry and original scholarly contributions. The Institute seeks to support a research-oriented academic environment in which eligible scholars can pursue approved research objectives in accordance with the applicable University framework.

Ph.D. candidates are expected to maintain high standards of research integrity, originality, academic honesty and professional conduct. They must comply with prescribed requirements relating to research methodology, coursework, progress monitoring, thesis submission and evaluation, and other applicable academic conditions.

Admission, registration, supervision, progress assessment, thesis evaluation and award of the Ph.D. degree shall be governed by the applicable ordinances and regulations of Maharshi Dayanand University, Rohtak, and relevant statutory requirements. Availability of research supervisors, approved research areas, facilities and seats is subject to University rules and applicable approvals.

15. Our Vision for the Future

Ganga Institute of Technology and Management aspires to contribute to the development of skilled professionals, responsible citizens and research-oriented scholars through quality education, technological advancement, ethical values and continuous improvement.

By emphasizing academic discipline, student support, innovation, industry engagement and research, the Institute seeks to prepare learners to respond effectively to the demands of a rapidly changing world.

GITAM remains committed to educational excellence, student development and the advancement of knowledge in accordance with the academic and regulatory framework of Maharshi Dayanand University, Rohtak.

CHAPTER-II

ELIGIBILITY FOR ADMISSION TO Ph.D. PROGRAM

The following are eligible to seek admission to the Ph.D. program

2.1 Candidates who have completed:

A 1-year/2-semester master's degree program in the concerned/allied subject after a 4-year/8-semester bachelor's degree program or a 2-year/4-semester master's degree program in the concerned/allied subject after a 3-year bachelor's degree program **or** qualifications declared equivalent to the master's degree by the corresponding statutory regulatory body, with at least 55% marks in aggregate or its equivalent grade in a point scale wherever grading system is followed **or** equivalent qualification 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 the educational institution.

Provided that a candidate seeking admission after a 4-year/8-semester bachelor's degree program should have a minimum of 75% marks in aggregate or its equivalent grade on a point scale wherever the grading system is followed.

2.1.1 A relaxation of 5% i.e. from 55% to 50% or its equivalent grade may be allowed for those belonging to SC/BC (non-creamy layer)/Differently-Abled and Economically Weaker Section (EWS) candidates of the Haryana State only.

2.2 Candidates who have completed the M.Phil. program with at least 55% marks in aggregate or its equivalent grade in a point scale wherever grading system is followed or equivalent qualification 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, shall be eligible for admission to the Ph.D. program.

2.2.1 A relaxation of 5% i.e. from 55% to 50% or its equivalent grade may be allowed for those belonging to SC/BC (non-creamy layer)/Differently-Abled and Economically Weaker Section (EWS) candidates of the Haryana State only.

CHAPTER-III
PROCEDURE FOR ADMISSION

3.1 The candidate shall apply in a prescribed application format (**Annexure A**) for admission to Ph.D. program.

3.2 Separate application form(s) shall be filled up for each subject/program.

3.3 The Institute shall notify the number of seats to be offered by each Department for admission to Ph.D. program on bi-annual basis in two cycles as per schedule notified by the Institute from time to time. A copy of the same will be submitted to the MDU, Rohtak.

3.4 Admission to Ph.D. program shall be made in the following manner:

3.4.1 Admission of the students who qualify for fellowship/scholarship in UGC-NET/UGC-CSIR NET/JRF/GATE/CEED and similar National Level tests based on an interview.

3.4.2 Through Common Ph.D. Entrance Test conducted by MDU, Rohtak and based on interview in subjects where NET examination is not conducted by the UGC.

A. Admission of NET qualified candidates

a. The Ph.D. seats will be first offered to the candidates in the following order of preference.

(i) Category-1 NET qualified candidates (Eligible for Award of JRF, Assistant Professor and Ph.D. admissions) based on their performance in the interview.

(ii) Category-2 NET qualified candidates (Eligible for Assistant Professor and Ph.D. admissions)

(iii) Category-3 NET qualified candidates (Eligible for Ph.D. admissions based on the maximum of the minimum cut offs prescribed by the UGC).

Note:

1. **The admission of the NET qualified candidates will be considered in the category (NET Category I/II/III) in which they were issued certificate by UGC.**
2. The Category-1 NET qualified candidates shall be admitted into the Ph.D. Programme based on the interview.
3. In case of category 2 and category 3 candidates, 70% weightage will be given for NET scores and 30% weightage for the interview for admission to Ph.D. programmes. The Ph.D. admission will be based on the combined merit of NET marks and the marks obtained in the interview.
4. For Category 1, the validity will be as mentioned in the UGC-NET Scorecard i.e. the candidates having valid NET Score will only be considered for admission to Ph.D. program.
5. The marks obtained in the NET by the candidates in Category 2 and 3 will be valid for a period of one year for admission to Ph.D.
6. The interview shall be of 30 Marks (15 marks for domain knowledge, 10 marks for research aptitude and 5 marks for research accomplishment).
7. Minimum eligibility will be 50% of marks in interview for Category 1, Category 2 and Category 3 candidates.
8. The admission processes for admitting students to Ph.D. Program will be as follows:

i) The seats will be offered for admission of Category-1 candidates (JRF only) on the basis of merit prepared as per the interview.

ii) The remaining vacant seats will be offered to Category 2 and Category 3 candidates in order of merit. The category 1 candidates may also apply for admission against the vacant seats, however, the admission will be based on 70% weightage of NET test score and 30% weightage for interview, and the validity of the UGC NET marks for this round of Counselling will be of one year.

b. INTERVIEW

The candidates will be given admission to Ph.D. program based on their performance in the interview by the interview board. At the time of interview, the candidates will be adjudged based on their domain knowledge, research aptitude and research accomplishment before a duly constituted Committee.

The interview domain in addition to above shall also include the following:

1. Competence for research
2. Feasibility of the research work at the Institute

The constitution of interview board shall be as follows:

(i) Director of the Institute – Convener
(ii) Dean Research and Development MDU Rohtak
(iii) All eligible Ph.D. supervisors of Department (s)
(iv) One faculty member belonging to SC/BC/Woman Category shall be co-opted as a Special Invitee in the Interview Committee, in case if they are not represented in (i) & (iii) above. In case, where there is no faculty member from SC/BC/Woman Category in the department, then one faculty member belonging to SC/BC/Woman Category from other department preferably from the same faculty will be co-opted as a Special Invitee. The Special Invitees in the interview board will act as observers only and will not be authorized to award marks for the interview purpose.
(v) The Director of the Institute may opt a Special Invitee from MDU, Rohtak.

Note:

(a) The Interview Committee shall comprise minimum of three faculty members
(b) In case a Department does not have requisite faculty member, the same shall be constituted by the Director on the request of the concerned Head of the Department from amongst the teachers of the concerned/relevant Faculty/Faculty from MDU, Rohtak.

B. FOR ADMISSION THROUGH ENTRANCE TEST IN SUBJECTS WHERE NET EXAMINATION IS NOT CONDUCTED BY THE UGC

a. In subjects (Engineering etc.) where NET examination is not conducted by the UGC, an entrance test will be conducted by MDU, Rohtak. The syllabus of the Entrance Test will be decided by the MDU, Rohtak
b. Entrance Test will be of 100 marks of 100 questions and a candidate must secure 50% marks to qualify the same. In case of SC/ST / Differently-abled candidates of Haryana State, a relaxation of 5% of 50 i.e. 2.5% will be allowed.
c. Entrance test syllabus shall consist of 50% of Research Methodology and 50% shall be of subject specific.
d. For the selection of candidates based on the entrance test a weightage of 70 % for

the entrance test and 30 % for the performance in the interview/viva- voce shall be given.

e. The remaining vacant seats after the admissions to category 1, category 2 and category 3 will be offered to the candidates who have qualified the entrance test. The admission will be based on 70% weightage of entrance test score and 30% weightage for interview.

Note: If two or more candidates secure identical marks in the merit, the candidate senior in age will be given preference.

ADMISSION COMMITTEE: -

The constitution of Admission Committee shall be as follows:

(i) Director – Convener

(ii) One eligible Ph.D. supervisors of from Each Department to be nominated by the Director.

(iii) One faculty member belonging to SC/BC/Woman Category shall be co-opted as a Special Invitee in the Admission Committee, in case if they are not represented in (i) & (ii) above. The Special Invitees in the Admission Committee will act as observers only and will not be authorized to award marks for the interview purpose.

Note:

- The Admission Committee shall comprise minimum of three members.

CHAPTER-IV

TOTAL NUMBER OF SEATS

Seat Matrix for admission to Ph.D. Program for the session 2026-27

Sr. No.	Department	Total No. of Seats for session 2026-27
1	Mechanical Engineering	20
2	Electronics & Communication Engineering	16
3	Electrical Engineering	4
4	Computer Science & Engineering	4
5	Management	22

CHAPTER-V

HOW TO APPLY FOR ADMISSION TO Ph.D. PROGRAM

1. The candidates are advised to read the Prospectus carefully before filling the online/offline Application Form. Incomplete application forms shall summarily be rejected.

2. The processing fee of the application for admission will be charged as Rs. 1000/-. Provided that candidates applying for admission to the Ph.D. programme after qualifying the Entrance Test conducted by Maharshi Dayanand University (MDU), Rohtak, shall be exempted from payment of the application processing fee to the Institute. Such candidates shall be required to produce the receipt of the fee paid to MDU, Rohtak.

3. A candidate may apply for admission to as many programmes as he/she wants. A separate application form for admission to each additional programme shall be required to be filled after paying Rs. 500/- (For additional Program).

4. The copies of certificates/testimonials of all examinations passed by the candidate from Matriculation onwards, other documents including certificates for claiming reservation, and the latest Character Certificate should be attached while filling the application form.

5. Self-attested copies of certificates/testimonials of all examinations passed by the candidate, including certificates for reservation, if any, and the latest Character Certificate, as applicable, along with the computer-generated application form, should be submitted to the concerned Department/Institute on or before the day of the interview for Ph.D.

6. The candidates must also attached the conversion formula for conversion of CGPA to percentage, wherever applicable. Candidates are required to fill in the percentage of marks secured in each examination using the said formula.

7. The candidate shall be personally responsible if he/she is not eligible to apply as per the prescribed eligibility criteria and the category under which he/she applies.

8. Incomplete/incorrect application forms shall be rejected summarily.

9. For claiming any benefit, the student must have a Parivar Pehchan Patra (PPP) issued by the Government of Haryana. The benefit will be granted on the basis of the verified information contained in it.

10. **All updated information, notices, changes and modifications shall be displayed on the website. Candidates are required to visit the website regularly to obtain the latest information. The same will be notified to all the eligible candidates.**

11. The merit lists for counseling/seat allotment shall be displayed on www.gangainstitute.com , as per the admission schedule. Individual allotment letters shall not be sent to candidates by the Institute. Physical reporting in the Institute, as per the

prescribed schedule, is mandatory for every candidate whose name/particulars appear in the merit list for the counseling.

12. All rules and regulations concerning submission of migration certificates by candidates who have passed the qualifying examinations from other universities shall be applicable as per the rules of Maharshi Dayanand University (MDU), Rohtak.

13. If a candidate is admitted on the basis of information submitted by him/her that is found to be incorrect or false at any stage, the admission shall be cancelled, and all fees and other dues paid by the candidate shall be forfeited. The Institute may take further action against the candidate, as deemed fit, in accordance with law.

14. In case of any ambiguity regarding a rule, the interpretation of the Institute in the matter shall be final.

15. All legal disputes relating to admission to any programme shall be subject to the jurisdiction of the competent courts at Jhajjar.

CHAPTER-VI
FEE STRUCTURE FOR Ph.D. PROGRAMME W.E.F. 2026-27

Sr. No.	Particulars	Fee in Rs.
A	**Admission Fee**	10000
B	**Coursework Fee**	30000
C	**Ph.D. Registration Application Form Fee**	500
D	**Registration Fee**	10000
E	**Annual Fee** Annual fee will be payable within thirty (30) days of registration and annually thereafter.	50000
F	**Evaluation fee to be charged at the time of submission of Ph.D. thesis**	As per the notification of MDU, Rohtak
G	**Late fee for delayed payment of annual fee (applicable to all new and old Ph.D. Scholars):**	
	(a) (i) up to six months	3000
	(ii) beyond six months	5000
	(b) Extension fee for every extended year (upto six years)	25000
	(c) Special Extension Fee beyond six years	50000

Note:-

- The attendance of the scholar should be maintained at the Department level. Further, in case of fellowship candidates, the attendance should be verified by the concerned supervisor duly forwarded by the Director of the Institute.

CHAPTER-VII

STUDENT'S CONDUCT AND DISCIPLINE RULES

1. **Application of Rules**: These rules shall apply to all the students of Ganga Institute of Technology and Management, Jhajjar.
2. **Acts of Indiscipline and Misconduct**: Any act of misconduct committed by a student inside or outside the campus shall be an act of violation of discipline of the Institute. Without prejudice to the generality of the foregoing provision, violation of the discipline shall include:
    a. Disruption of teaching, study, examination, research or administrative work, curricular or extra-curricular activity or residential life of the members of the Institute, including any attempt to prevent any member of the Institute or its staff from carrying on his or her work and doing any act reasonably likely to cause such disruption.
    b. Damaging or defacing Institute property or the property of the members of the Institute or any other property inside or outside the Institute Campus.
    c. Engaging in any attempt as wrongful confinement of teachers, officers, employees and students of the Institute.
    d. Use of abusive and derogatory slogans or intimidating language or incitement of hatred and violence or any act calculated to further the same.
    e. Smoking in the Institute Campus.
    f. Eve-teasing and/or disrespectful behavior towards girl students and women.
    g. Any assault upon or intimidation of or insulting behaviour towards a teacher, officer, employee or student or any other person.
    h. Causing or colluding in the unauthorized entry of any person in the campus or in the unauthorized occupation of any portion of Institute premises, including Hostels by any person.
    i. Getting enrolled in more than one program of study simultaneously in violation of Institute rules.
    j. Committing forgery, tampering with or misuse of Institute documents, records or wi-fi, identification cards etc.
    k. Furnishing false certificate or false information to any office under the control and jurisdiction of the Institute.
    l. Consuming or possessing alcoholic drinks, dangerous drugs or other intoxicants in the Institute premises.
    m. Indulging in acts of gambling in the Institute premises.
    n. Possessing or using weapons such as knives, lathis, iron chains, iron rods, sticks, explosives and fire arms in the Institute premises
    o. Arousing communal, caste or regional feelings or creating disharmony among students.

p. Not disclosing one's identity when asked to do so by an employee or officer of the Institute who is authorized to ask for identity.
q. Tearing of pages, defacing, burning or destroying books etc. of library.
r. Unauthorized occupation of Hostel Rooms or unauthorized use of Institute furniture in one's Hostel Room or elsewhere.
s. Accommodating guests or other persons in Hostel without permission of the competent authority.
t. Improper rendering of accounts for money drawn from or through any office under the control and jurisdiction of the Institute.
u. Any act of moral turpitude
    i. Any offence under law.
    ii. Committing any of the offences specified in the examination rules of the Institute (Control of unfair means and disorderly conduct)
    iii. Violation of Traffic Rules in the Institute premises.
    iv. Pasting of posters, distributing of pamphlets, handbills etc. of objectionable nature or writing on walls and disfiguring buildings.
    v. Any other act considered by the Director or the Discipline Committee to be an act of violation of discipline.

3. **Disciplinary Action**: Without any prejudice to the powers of the Director as specified the disciplinary committee is authorized to take disciplinary action by way of imposing penalties etc.
4. **Nature of Penalties**: The following penalties may, for acts of indiscipline or misconduct or for good and sufficient reasons, be imposed on a student, namely:
    a. Written warning and information to the guardian.
    b. Fine as may be warranted by the nature of case.
    c. Suspension from the Class/ Department/ College/ Hostel/ Mess/ Library or withdrawal of any other facility of this nature.
    d. Suspension or cancellation of scholarships, fellowships or any financial assistance from any source, or recommendation to that effect to the sanctioning agency.
    e. Recovery of pecuniary loss caused to Institute property.
    f. Debarring from participation in Sports/NCC/NSS and other such activities.
    g. Disqualifying from holding any representative position in the Class/College/ Hostel/ Mess/Sports/Clubs and in similar other bodies.
    h. Hostel shift.
    i. Expulsion from the Department/ Faculty/ Hostel/ Mess/ Library/ Clubs for a specified period.
    j. Debarring from an examination.
    k. Non-issue of Migration Certificate.
    l. Expulsion from the Institute for a specified period.
    m. Disqualifying from further studies, or prohibition for future admission or re-admission.

n. Any student against whom an allegation of misconduct has been made may be suspended from the rolls of the Institute by the Director, pending enquiry or pending trial on a cognizable offence by a court of Law.

5. **Opportunity to be given before Award of Penalty:** No penalty, shall be imposed without giving to the student a reasonable opportunity of being heard.
6. **Review of Appeal against the Penalty:** A review would lie to the Officer issuing the orders within seven days, and an appeal would lie against the orders of the authorities mentioned in these rules (except the Director) to the Disciplinary Committee of the Institute.

7. **Prohibition of Ragging**

"The instructions for curbing ragging as conveyed by the UGC vide letter No. 1-15/2009 (ARC) pt. III dated 17.03.2017, in view of the judgment of the Honble Supreme Court of India dated 08.05.2009 in Civil Appeal No. 887/2009 and also given in Chapter X be adhered to strictly (UGC Regulations on Curbing the Menace of Ragging in Higher Education Institutions, 2009, UGC website: www.ugc.ac.in & the Haryana Prohibition of Ragging in Educational Institution Ordinance 2012) :

Ragging in educational institutions is banned and any one indulging in ragging is likely to be punished appropriately. The punishment may include expulsion/suspension from the institution or classes for a limited period or fine with a public apology. The punishment may also take shape of (i) withholding or withdrawing scholarships or fellowships and other benefits (ii) forfeiting campus placement opportunities or recommendations. (iii) debarring from appearing in any test or examination or other evaluation process (iv) debarring from representing the educational institution in any reasonable, national or international meet, tournament, youth festival, etc. (v) withholding results (vi) suspension or expulsion from hostel or mess (vii) cancellation of admission (viii) lodging of FIR with the local police. If the individuals committing or abetting ragging are not/cannot be identified, collective punishment can be awarded to act as a deterrent.

Any disorderly conduct whether by words spoken or written or by an act which has the effect of teasing, treating or handling with rudeness any other students, indulging in rowdy or undisciplined activities which causes or is likely to cause annoyance, hardship or psychological harm or to raise fear apprehension thereof in fresher or junior students or asking the students to do any act or perform something which such students will not do in the ordinary course and which has the effect of causing or generating a sense of shame of embarrassment so as to adversely effect the physique or psyche of a fresher or a junior student or any type of abuse through electronic media or wrongful confinement, use of criminal force, assault as well as sexual offence, trespass, defamation or threat to defame will be deemed an act of ragging. Hon'ble Supreme Court of India in SPL (C) No. 24295/2004 in the matter of University of Kerala V/s

Council of Principals, Colleges of Kerala and others has ordered that if any incident of ragging comes to the notice of the authority, the concerned student shall be given liberty to explain to if his/ her explanation is not found satisfactory, the authority would expel him/her from the Institution.

The applicants at the time of admission are required to give an undertaking against ragging.

8. Check on the menace of sexual harassment and violence against women:

The Institute has a zero tolerance policy towards the act of sexual harassment. Sexual harassment is taken as a serious act of indiscipline. A Committee, constituted by the Director under the Chairpersonship of a senior female professor, will check the menace of sexual harassment and violence against girl students and women. The Sexual Harassment includes any unwelcome sexually determined behavior, whether directly or by implication and includes physical contact and advances, a demand or request for sexual favors, sexually-colored remarks, showing pornography or any other unwelcome physical, verbal or non-verbal conduct of sexual nature.

The Committee shall take all precautionary measures to prevent sexual harassment and violence against girl students and women in the Institute. It shall also ensure that there is no hostile environment towards girl students and women. No girl student should have reasonable ground to believe that she is at a disadvantage or is being discriminated against. If any complaint of sexual harassment comes to the notice of the Committee, immediate disciplinary action along with appropriate action in accordance with the law would be taken.

CHAPTER-VIII

FACULTY OF ENGINEERING AND TECHNOLOGY, MANAGEMENT
(Recognized Ph.D. Supervisors)

S. No.	Name of the faculty	Qualification	Designation	Area of Specialization
1	Prof. Aman Aggarwal	Ph.D.	Director/Professor	Mechanical Engineering
2	Dr. Jitender Kumar	Ph.D.	Assistant Professor	Mechanical Engineering
3	Dr. Hari Parshad	Ph.D.	Assistant Professor	Mechanical Engineering
4	Dr. Vishant Kumar	Ph.D.	Assistant Professor	Mechanical Engineering
5	Dr. Rakesh Kumar Joon	Ph.D.	Assistant Professor	Electronics & Communication Engineering
6	Dr. Nitin Kumar	Ph.D.	Assistant Professor	Electronics & Communication Engineering
7	Dr. Vivek Kumar	Ph.D.	Assistant Professor	Electronics & Communication Engineering
8	Dr. Hitanshu Saluja	Ph.D.	Assistant Professor	Electronics & Communication Engineering
9	Dr. Joginder Singh	Ph.D.	Assistant Professor	Electrical Engineering
10	Dr. parmod Kumar	Ph.D.	Assistant Professor	Computer Science & Engineering
11	Dr. Punam Devi	Ph.D.	Professor	Management
12	Dr. Payush	Ph.D.	Associate Professor	Management
13	Dr. Dipika	Ph.D.	Assistant Professor	Management
14	Dr. Bhawna Yadav	Ph.D.	Assistant Professor	Management

ANNEXURE A

GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, JHAJJAR

AN AUTONOMOUS INSTITUTE | AFFILIATED TO MAHARSHI DAYANAND UNIVERSITY, ROHTAK

Recent passport size photograph with signature of the Candidate across the Photo

APPLICATION FOR ADMISSION TO Ph.D. PROGRAM

(Full Time)

1	Name of Candidate			
2	Father's Name			
3	Permanent Address			
4	Mobile No.			
5.	Email id			
6.	Date of Birth (as given in Matriculation Certificate)			
7	Nationality			
8	Parivar Pehchan Patra (PPP) ID if available			
9	Category of student			
10	Registration No.(In case of ex-student of MDU)			
11	Name of the Department in which Ph.D. admission is sought			
12	Category under which Ph.D. admission (Tick the appropriate one) is sought	a	UGC-NET Category-1	
		b	UGC-NET Category-2	
		c	UGC-NET Category-3	
		d	Entrance test, if applicable	

13. Details of previous examination passed (Please enclosed copy of Marks card)

Examination passed	Year	Name of University/Board	Marks obtained	Maximum Marks	Percentage
10th					
12th					
Graduation					
Post-Graduation					
UGC-NET (Category-1/2/3)					

14. Details of Research Publications:

Title of paper	Details of authors	Year of Publication, Volume No. and Page No.	Journal impact factor, if any (only Thomson Reuters)	Indexing (Scopus/ Web of Science/ UGC CARE List)

15. Details of Migration Certificate, if applicable:

Name of the University:	
Program Completed:	

DECLARATION BY THE CANDIDATE

a. I declare that I have read the rules, the relevant Ph.D. Ordinance of the Institute and undertake to abide by them.
b. I declare that I am not approaching any other University nor I have simultaneously registered for any other certificate, diploma or degree at any other University nor I am appearing at any examination of this University or any other University.
c. I hereby declare that the entries furnished in the form and enclosures are true to the best of my knowledge and belief. In case any entry in this form is found to be false, I will have no objection if the University/Institute disqualifies me from the program and/or debars me from seeking admission in any program of the Institute/University even at a later stage.
d. I hereby declare that I shall abide by the rules and regulations of the Institute/University issued from time to time.

(Signature of Candidate)

Check List of enclosures:

Details	Please specify Yes/No, If yes upload the corresponding document
10th Marks Card	
12th Marks Card	
Graduation Marks Card	
Post-Graduation Marks Card	
Proof of qualifying UGC-NET (Category-1/2/3)	
Proof of publications	
Migration Certificate, if applicable	

Appendix-A

Self-Declaration by the Student

I, …….. (Full Name of the Student with admission/ registration/ enrollment No.) S/o, D/o Mr./Mrs./Ms. …….. having been admitted to …… (name of the institution) have carefully read—THE HARYANA PROHIBITION OF RAGGING IN EDUCATIONAL INSTITUTION ORDINANCE, 2012 and fully understood the provisions contained in the said ordinance.

1. I have, in particular, perused clause 2(f) of the ordinance and am aware as to what constitutes ragging.
2. I have also, in particular, perused clause 8 of the Ordinance and I am fully aware of the penal and administrative action that is liable to be taken against me in case I am found guilty of or abetting ragging, actively or passively, or being part of conspiracy to promote ragging.
3. I hereby solemnly aware and undertake that:
   a) I will not indulge in any behavior or act that may be constituted as ragging under the ordinance.
   b) I will not participate in or abet or propagate through any act of commission or omission that may be constituted as ragging under the Ordinance.
4. I hereby affirm that, if found guilty of ragging, I am liable for punishment according to Ordinance, without prejudice to any other criminal action that may be taken against me under any penal law or any, law for the time being in force.
5. I hereby declare that I have not been expelled or debarred from admission in any institution in the county on account of being found guilty of, abetting or being part of a conspiracy to promote, ragging; and further affirm that, in case the declaration is found to be untrue, I am aware that my admission is liable to be cancelled.

Declared this …….day of…….. month of …… year.

Signature of the Student Name:

Appendix -B

Self-Declaration by the Parent/ Guardian

I, Mr./Mrs./Ms…… (Full name of parent/ guardian) father/ mother/ guardian of……, (Full name of student with Institute Roll No.), having been admitted to ……(name of the institution) have carefully read —THE HARYANA PROHIBITION OF RAGGING IN EDUCATIONAL INSTITUTION ORDINANCE,2012 and fully understood the provisions contained in the said ordinance.

1. I have, in particular, perused clause 2(f) of the ordinance and am aware as to what constitutes ragging.
2. I have also, in particular, perused clause 8 of the Ordinance and I am fully aware of the penal and administrative action that is liable to be taken against me in case I am found guilty of or abetting ragging, actively or passively, or being part of conspiracy to promote ragging.
3. I hereby solemnly aware and undertake that:
   a. My ward will not indulge in any behavior or act that may be constituted as ragging under the ordinance.
   b. My ward will not participate in or abet or propagate through any act of commission or omission that may be constituted as ragging under the Ordinance.
4. I hereby affirm that, if found guilty of ragging, my ward is liable for punishment according to Ordinance, without prejudice to any other criminal action that may be taken against me under any penal law or any, law for the time being in force.
5. I hereby declare that my ward has not been expelled or debarred from admission in any institution in the county on account of being found guilty of, abetting or being part of a conspiracy to promote, ragging; and further affirm that, in case the declaration is found to be untrue, the admission of my ward is liable to be cancelled.

Declared this…… day of…… month of…….. year.

Signature of the Parent/ Guardian Name:

Address:

Telephone/ Mobile No.

E-mail id

Appendix-C

Undertaking for Gap Year

I……..S/o.,……..resident of……. do hereby solemnly state & affirm as under:

1. That I am a resident of above said address.
2. That I have passed class in the year from …… School/College/Institute/University.
   a. That I have not joined/admitted in any School/College/Institution due to……..(Reason).
3. That there is a GAP in my studies from …….. to…….. .
4. That during this period I was not involved in an illegal activity and that no Criminal case is pending against me in any court of Law.
5. That I command a good reputation and respect in general public.
6. That I have not availed post matric scholarship for the same programme name or program from any College/University/Institute during the gap year.

Deponent (Student)

Verification: -

Verified that the contents of my above said undertaking are true correct to the best of my knowledge and belief and nothing has been concealed or misrepresented therein. In case the above facts are found incorrect any state then my admission can be cancelled by the University.

Date:

Place:

Deponent (Student)

GITAM



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Campus

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