सीनेट की एकसौएकवी बैठक का कार्यवृत्त

MINUTES OF THE 101ST MEETING OF THE SENATE

29 मई 2024
29th MAY 2024

भारतीय प्रौद्योगिकी संस्थान रूड़की
रूड़की – 247 667 (भारत)
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE
ROORKEE – 247 667 (INDIA)

भारतीय प्रौद्योगिकी संस्थान रूड़की
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE
रूड़की 247 667
ROORKEE – 247 667

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101.4	इंस्टीटयूट **इंस्ट्रूमेंटेशन** सेंटर में पीएचडी कार्यक्रम में प्रवेश के लिए न्यूनतम शैक्षणिक योग्यता (एमईक्यू) में संशोधन पर विचार करना। To consider the modification in the Minimum Educational Qualification (MEQ) for admission to Ph.D. programme in Institute Instrumentation Centre.	3
101.5	छात्रों के लिए प्रस्तावित 'उपस्थिति–नीति' पर विचार करना। To consider the proposed attendance policy for the students.	3
101.6	भौतिकी विभाग और इलेक्ट्रॉनिक्स और संचार इंजीनियरिंग विभाग द्वारा एक नया केन्द्र यानि सेमीकंडक्टर टेक्नोलॉजी केन्द्र स्थापित करने के संयुक्त प्रस्ताव पर विचार करना। To consider the Joint proposal of Department of Physics and Department of Electronics and Communication Engineering to establish a new Centre i.e. Centre for Semiconductor Technology.	4
101.7	सेमीकंडक्टर प्रौद्योगिकी कार्यक्रम में संयुक्त/दोहरी मास्टर डिग्री के तहत नामांकित छात्रों के लिए ताइवानी विश्वविद्यालयों से आईआईटी रूड़की में क्रेडिट हस्तांतरण की व्यवस्था पर विचार करना। To consider the mechanism of credit transfer from Taiwanese Universities to IIT Roorkee for the students enrolled under Joint/Dual Master's Degree in Semiconductor Technology program.	4
101.8	पीएचडी छात्रो को प्री–पीएचडी पाठयक्रम कार्य की न्यूनतम आवश्यकताओं को कम करने के लिए विभागों/केन्द्रो/स्कूलों के प्रस्ताव पर विचार करना। To consider the proposal of the Departments/ Centres/School to reduce minimum requirements of pre-Ph.D. course work for Ph.D. students.	4
101.9	सीजीपीए को समकक्ष प्रतिशत में बदलने और प्रथम श्रेणी वर्गीकृत करने के फॉर्मूले की समीक्षा करने के प्रस्ताव पर विचार करना। To consider a proposal to review the formula for conversion of CGPA to equivalent percentage and award of First Division.	5
101.10	नए पीजी पाठयक्रम के अनुसार विभिन्न विभागों/केन्द्रों/स्कूलों से प्राप्त कार्यक्रम संरचनाओं पर विचार करना। To consider the program structures received from the various Departments/Centres/School as per the new PG curriculum.	5

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INDIAN INSTITUTE OF TECHNOLOGY ROORKEE
MEETING SECTION

Minutes of the 101st Meeting of the Senate held on 29.05.2024 at 04.00 P.M. in the Senate Hall.

The list of participants who attended the meeting and those who have conveyed their inability to attend are appended at **Annexure-I & Annexure-II** respectively.

At the outset, the Chairman welcomed the members in the 101st meeting of the Senate, with the following new members, and wished for their active participation in the proceedings of the Senate:

1. Prof. Naveen Kumar Navani, Dean of Academic Affairs
2. Prof. Rajib Lochan Dhar, MS Department
3. Prof. Anil Kumar Gourishetty, Physics Department
4. Prof. Dheeraj Kumar Khatod, EE Department
5. Prof. Abhayanand Singh Maurya, ES Department
6. Prof. Falguni Pattanaik, ADOAA (Curriculum)
7. Prof. Pradeep Srivastava, ADOAA (Evaluation)
8. Prof. Sanjay Chikarmane, Associate Dean Infra. (Projects)
9. Prof. Yogesh Vijay Hote, Chairman SCSP

The Chairman greatly appreciated the sincere services of Prof. Apurbba Kumar Sharma and Prof. A. Swaminathan placed on record the valuable contributions made by them as the previous Dean of Academic Affairs and Associate Dean-Admissions & IT respectively.

The Chairman also thanked and placed on record the valuable contributions of the outgoing following members:

1. Prof. N.K. Goel, Department of Hydrology
2. Prof. K. Murugesan, Department of Mechanical & Industrial Engg.
3. Dr. C. Jayakumar, Librarian
4. Prof. Dheeraj Kumar Khatod, Chairman SCSP
5. Prof. P.C. Ashwin Kumar, Associate Dean Infra. (Projects)

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In his opening remarks it was stated that ETE and JEE (Advanced) are now over and so all have the right time to give a thought as to how the IIT Roorkee be taken forward. He requested to the Heads and Professors to provide guidance and mentorship to the young faculty in the departments and contribute more into the department which will take forward to the institute towards a mission of Viksit Bharat. He emphasized more on collaborative research & multidisciplinary research and collaboration with the industries. It was emphasized that in NEP-2020, the most important factor in the success of higher education is on the quality and engagement of enthusiastic and motivated faculty who can motivate their students and profession.

The agenda was then taken up.

Item No. 101.1: To confirm the minutes of the 100th Senate meeting held on 06.03.2024.

No comment was received. Minutes of 100th meeting of the Senate as circulated on 30.03.2024 were confirmed.

Item No. 101.2: To report on the actions taken to implement the decisions of the Senate taken in its 100th meeting held on 06.03.2024.

The Senate noted the actions taken on the minutes.

Item No.101.3: To consider a proposal for the candidates who have obtained B.Tech. or M.Sc. degree with a CGPA of 8.0 and above from any of the Ministry of Education notified CFTIs, without GATE/NET, etc. requirement for the admissions to the Ph.D. Programme at IIT Roorkee.

The Senate considered the proposal and approved that the requirement of the national level tests such as GATE/NET, for admissions to the Ph.D. Programme need not to be emphasized in case a candidate have a B.Tech. degree or M.Sc. with a CGPA of 8.0 and above obtained from the Ministry of Education funded Technical Institutions (erstwhile CFTIs of MoE). List is attached as **(Appendix-A)**.

The above is a minimum eligibility requirement and the departments are free to enhance the threshold, if required.

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Item No.101.4: To consider the modification in the Minimum Educational Qualification (MEQ) for admission to Ph.D. programme in Institute Instrumentation Centre.

The Senate considered and approved the MEQs for admission into the following Ph.D. programmes:

Center	Revised Minimum Educational Qualification
Institute Instrumentation Centre	(i) M.Sc. in Physics, Applied Physics, Material Science, Chemistry, Electronics & Nanotechnology with NET/GATE. M.Sc. in Biological Sciences, Life sciences or related with NET/GATE. (ii) M.Tech (CS)/ (Biotechnology)/(Nanotechnology)/ (Material Science or equivalent) with NET/GATE (iii) B.Tech (Engineering Physics), (EC) / (CS)/ (Biotechnology) with NET/GATE

Further, the Senate decided that if a candidate has a M.Sc./B.Tech. degree with a CGPA of 8.0 and above from the Ministry of Education funded Technical Institutions, the requirement of any qualifying national level exam such as GATE/NET be waived off.

Item No.101.5: To consider the proposed attendance policy for the students.

The Senate considered the proposal and approved the following policy on attendance:

1. All the students are required to attend every scheduled lecture, tutorial and practical. Attendance will be recorded for all classes.
2. The course coordinator may evolve a suitable mechanism to recognize the regular attendance and the course coordinator, at discretion, can assign up to 10% of marks in the semester for attendance. However, it needs to be announced at the beginning of semester and should be documented with a copy to the Academic office.

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Item No.101.6: To consider the Joint proposal of Department of Physics and Department of Electronics and Communication Engineering to establish a new Centre i.e. Centre for Semiconductor Technology.

The Senate recommended the proposal for the establishment of a new Centre 'Centre for Semiconductor Design and Technology' to the Board of Governors for approval.

Item No.101.7: To consider the mechanism of credit transfer from Taiwanese Universities to IIT Roorkee for the students enrolled under Joint/Dual Master's Degree in Semiconductor Technology program.

The Senate considered and approved the following:

(i) Three credit course of Taiwanese Universities will be transferred as four (4) credit course at IIT Roorkee.

(ii) Students who have passed seminar at Taiwanese Universities will be transferred as two (2) credit course at IIT Roorkee. The grades for the seminar course will be awarded by the internal supervisor @ IIT Roorkee (seminar will be evaluated/supervised jointly.

The Senate also advised that in view of the increasing number of students going to the universities/institutions across the globe for semester exchange, the Chairperson, Senate may constitute a committee in consultation with Dean, International Relations to formulate a policy on translation of credits and give recommendation.

Item No.101.8: To consider the proposal of the Departments/ Centres/ School to reduce minimum requirements of pre-Ph.D. course work for Ph.D. students.

The item was deferred and referred back to IRC for detailed deliberations.

Further, the Senate advised to study the practice followed in other IITs.

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Item No.101.9: To consider a proposal to review the formula for conversion of CGPA to equivalent percentage and award of First Division.

The Senate approved the following:

1. Formula for conversion of CGPA to percentage (notional): CGPA multiplied by the factor of 10 (CGPA*10).

2. For the purpose of employment or requirement of any external recruitment agency that IIT Roorkee graduate wishes to join, a CGPA of 6.0 or above be considered as First Division.

Item No.101.10: To consider the program structures received from the various Departments/Centres/School as per the new PG curriculum.

The Senate considered the item and approved the semester-wise structures for master's programme of sixteen departments/Centres. **(Appendix-B)**. Further, Senate advised to review the structure after one year, if required.

The Departments/Centers/School shall submit the course outlines of the courses offered in the forthcoming semester to the DoAA positively before June 30, 2024.

Item No.101.11: To consider the proposal for organizing the forthcoming Convocation.

The Senate has accorded in-principle approval for above proposal. However, the Senate has decided to conduct the Convocation-2024 as per extant practice due to paucity of time.

Item No.101.12: To consider a report of the Committee constituted to review the policy on awards/ prizes/scholarships.

The Senate considered the report of the Committee and accepted the same for implementation.

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Item No.101.13: To consider a proposal to review the selection criteria of Departmental Gold medal and Best Project Award.

The Senate considered the following recommendations of SCSP :

1. The Department Gold medal be given for both UG and PG programmes separately.

2. The SCSP should proposed the explicit selection criteria for breaking tie in UG and PG Gold Medal.

   a. In case of UG Gold Medal, the maximum no of 'A+' or 'A's be accounted to break a tie.
   b. In case of PG Gold Medal, the publication or patents be accounted to break a tie.

3. The Best Project Award be given to entire team of project.

Further, the Senate suggested that to rationalize or limit the number of Gold Medal in a department of particular category, the Donor be asked to propose the criteria for the Gold Medal proposed to be instituted.

Item No.101.14: To present the Sectoral Vision statements for a purpose to develop and prepare a document to achieve the goals for Viksit Bharat@2047.

The Senate considered the presentation on vision given by the Dean of Academic Affairs **(Appendix-C).** The following were the themes to prepare an Institute document on Viksit Bharat@2047 toward transforming India:

1. Empowered Citizens
2. Thriving & Sustainable Economy
3. Technology Innovation & Leadership
4. Effective Governance
5. Bharat as Vishwabandhu

The Senate suggested that this document be sent to all faculty members and invite their insights. The departments/centres should also develop their 'short-term' & 'long-term' vision with a roadmap as to how the research in their area can contribute to the society.

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Item No.101.15: To report the following approval accorded by the Chairman, Senate on behalf of the Senate.

The Senate noted the items.

Under Any other items

Item No.101.16: To consider award of 237 Ph.D. Degrees for the students after the 97th Senate for the students who have completed the requirements for award of degrees w.e.f. 13.09.2023.

The Senate considered and recommended to the Board of Governors to include 237 Ph.D. Degrees to the students who have duly qualified for the award in forthcoming Convocation as given in **(Appendix-D).**

Item No.101.17: To report the approval accorded by the Chairman, Senate on behalf of the Senate regarding at any given time, not more than 5 Ph.D. Scholars with Institute Assistantship can be supervised by a Faculty in the Department/Center/ School:

The Senate noted the item and observed that at present there have been a larger number of Ph.D. scholars who have not completed the Ph.D. even after six years. This has created logistic challenges. In view of this, it is advisable to take not more than five students for Institute Assistantship. However, in case of Joint Faculty, 2 more Ph.D. students with Institute Assistantship will be allowed in the Center/Department.

Further, in case of Co-supervision, 1 student shall be counted as 0.5 student.

Further, the Senate emphasized that the Department/Centre should immediately take care of the interest of new faculty members by ensuring that each new faculty member be given at least one Ph.D. student with Institute Assistantship in first admission cycle after their joining at IIT Roorkee.

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

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Annexure-I

Following were present

1.	Prof. K.K. Pant	Director & Chairman
2.	Prof. U.P. Singh	Dy. Director
3.	Prof. Jaydev	Applied Math. and Scientific Computing
4.	Prof. Mahua Mukherjee	Architecture & Planning
5.	Prof. Sanjay Ghosh	Biosciences & Bioengineering
6.	Prof. Pravindra Kumar	Biosciences & Bioengineering
7.	Prof. Naveen Kumar Nawani	Biosciences & Bioengineering
8.	Prof. Gopinath Packirisamy	Biosciences & Bioengineering
9.	Prof. Ranjana Pathania	Biosciences & Bioengineering
10.	Prof. M.K. Mohan Poluri	Biosciences & Bioengineering
11.	Prof. Partha Roy	Biosciences & Bioengineering
12.	Prof. Ashwani Kumar Sharma	Biosciences & Bioengineering
13.	Prof. Shailly Tomar	Biosciences & Bioengineering
14.	Prof. Prakash Biswas	Chemical Engineering
15.	Prof. Amit Kumar Dhiman	Chemical Engineering
16.	Prof. Vimal Kumar	Chemical Engineering
17.	Prof. P.P. Kundu	Chemical Engineering
18.	Prof. Ram Prakash	Chemical Engineering
19.	Prof. B. Prasad	Chemical Engineering
20.	Prof. Vimal Chandra Srivastava	Chemical Engineering
21.	Prof. R.K. Dutta	Chemistry
22.	Prof. Jeevanandam P.	Chemistry
23.	Prof. R.K. Peddinti	Chemistry
24.	Prof. Muniappan Sankar	Chemistry
25.	Prof. Satish Chandra	Civil Engineering
26.	Prof. Rajib Chowdhury	Civil Engineering
27.	Prof. Rahul Dev Garg	Civil Engineering
28.	Prof. Praveen Kumar	Civil Engineering
29.	Prof. Priti Maheshwari	Civil Engineering
30.	Prof. Rajat Rastogi	Civil Engineering
31.	Prof. Sudipta Sarkar	Civil Engineering
32.	Prof. Umesh Kumar Sharma	Civil Engineering
33.	Prof. Mahendra Singh	Civil Engineering
34.	Prof. Akhil Upadhyay	Civil Engineering
35.	Prof. Sugata Gangopadhyay	Computer Science & Engineering
36.	Prof. Sandeep Kumar	Computer Science & Engineering
37.	Prof. Manoj Misra	Computer Science & Engineering
38.	Prof. Rajdeep Niyogi	Computer Science & Engineering
39.	Prof. R.N. Dubey	Earthquake Engineering
40.	Prof. Bal Krishna Maheshwari	Earthquake Engineering
41.	Prof. Daya Shankar	Earthquake Engineering
42.	Prof. Manish Shrikhande	Earthquake Engineering

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43.	Prof. Sunil Bajpai	Earth Sciences
44.	Prof. G.J. Chakrapani	Earth Sciences
45.	Prof. Anand Joshi	Earth Sciences
46.	Prof. Pramod Agarwal	Electrical Engineering
47.	Prof. Yogesh Vijay Hote	Electrical Engineering
48.	Prof. Dheeraj Kumar Khatod	Electrical Engineering
49.	Prof. Vishal Kumar	Electrical Engineering
50.	Prof. Mukesh Kumar Pathak	Electrical Engineering
51.	Prof. Anand Bulusu	Electronics & Communication Engg.
52.	Prof. Sudeb Dasgupta	Electronics & Communication Engg.
53.	Prof. N.P. Pathak	Electronics & Communication Engg.
54.	Prof. Amalendu Patnaik	Electronics & Communication Engg.
55.	Prof. (Mrs.) Smita Jha	Humanities & Social Sciences
56.	Prof. Sukh Pal Singh	Humanities & Social Sciences
57.	Prof. D.S. Arya	Hydrology
58.	Prof. M.K. Jain	Hydrology
59.	Prof. Sumit Sen	Hydrology
60.	Prof. Brijesh Kumar Yadav	Hydrology
61.	Prof. Arun Kumar	Hydro & Renewable Energy
62.	Prof. Sunil Kumar Singhal	Hydro & Renewable Energy
63.	Prof. Ramesh A.	Management Studies
64.	Prof. Rajat Agarwal	Management Studies
65.	Prof. Vinay Sharma	Management Studies
66.	Prof. Sanjeev Kumar	Mathematics
67.	Prof. Maheshanand	Mathematics
68.	Prof. Tanuja Srivastava	Mathematics
69.	Prof. A. Swaminathan	Mathematics
70.	Prof. Akshay Dvivedi	Mechanical & Industrial Engg.
71.	Prof. P.K. Jha	Mechanical & Industrial Engg.
72.	Prof. Manish Mishra	Mechanical & Industrial Engg.
73.	Prof. P.M. Pathak	Mechanical & Industrial Engg.
74.	Prof. V.H.Saran	Mechanical & Industrial Engg.
75.	Prof. Inderdeep Singh	Mechanical & Industrial Engg.
76.	Prof. K.M. Singh	Mechanical & Industrial Engg.
77.	Prof. Indra Vir Singh	Mechanical & Industrial Engg.
78.	Prof. Sudhakar Subudhi	Mechanical & Industrial Engg.
79.	Prof. Andallib Tariq	Mechanical & Industrial Engg.
80.	Prof. S.H. Upadhyay	Mechanical & Industrial Engg.
81.	Prof. B.S.S. Daniel	Metallurgical & Materials Engg.
82.	Prof. B.V.M. Kumar	Metallurgical & Materials Engg.
83.	Prof.(Mrs.)Debrupa Lahiri	Metallurgical & Materials Engg.
84.	Prof. Indranil Lahiri	Metallurgical & Materials Engg.
85.	Prof. Suhrit Mula	Metallurgical & Materials Engg.
86.	Prof. Vivek Pancholi	Metallurgical & Materials Engg.
87.	Prof. Ujjwal Prakash	Metallurgical & Materials Engg.
88.	Prof. Anjan Sil	Metallurgical & Materials Engg.

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89.	Prof. Dharam Dutt	Paper Technology,Saharanpur Campus
90.	Prof. Ajay	Physics
91.	Prof. P. Arumugam	Physics
92.	Prof. Anil Kumar Gourishetty	Physics
93.	Prof. (Mrs.) Tulika Maitra	Physics
94.	Prof. Anirban Mitra	Physics
95.	Prof. Tashi Nautiyal	Physics
96.	Prof. Vipul Rastogi	Physics
97.	Prof. Yogesh Kumar Sharma	Physics
98.	Prof. Ghanshyam Das Verma	Physics
99.	Prof. Ajay Wasan	Physics
100.	Prof. Kanhaiya Lal Yadav	Physics
101.	Prof. Deepak Khare	WRD&M
102.	Prof. Ashish Pandey	WRD&M

103. Prof. Sateesh Kumar Peddoju, Head, Institute Computer Centre
104. Prof. Uttam Kumar Roy, Head of the Centre of Transportation Systems.
105. Prof. Soumitra Satapathi, Head, Centre for Flexible and Smart Energy Device (CFSE).
106. Prof. Mukesh Kumar Singhal, Head, Department of Hydro & Renewable Energy
107. Prof. Avlokita Agarwal, Associate DOSW (Student Wellness)
108. Prof. M.V.Sunil Krishna, Assoc. DOSW (Students' Activities)
109. Prof. Vivek Kumar Malik, Associate Dean Innovation and Incubation
110. Prof. Ramudu Meka, Associate Dean for Corporate Interaction
111. Prof. Falguni Pattanaik, ADOAA (Curriculum)
112. Prof. E.Rajasekar, Associate Dean, Infras. (Civil)
113. Prof. Meenakshi Rawat, ADOAA (IT Systems & Admission)
114. Prof. Pradeep Srivastava, ADOAA (Evaluation)
115. Dr. Sanjeev Kumar Sunny, Actg. Librarian
116. Prof. Karun Rawat, Associate Professor - Special Invitee
117. Mr. Prashant Garg, Registrar & Secretary, Senate

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Annexure-II

The following members conveyed their inability to join the meeting.

1. Prof. V. Devadas, Department of Architecture and Planning
2. Prof. Debabrata Sircar, Department of Biosciences and Bioengineering
3. Prof. Satyendra Mittal. Department of Civil Engg.
4. Prof. N K Samadhiya, Department of Civil Engineering
5. Prof. Ramesh Chandra, Institute Instrumentation Centre
6. Prof. G.P. Chaudhari, Department of Metallurgical and Materials Engg.
7. Prof. Prof. Gaurav Manik, Department of Polymer Science & Engineering
8. Prof. Rajdeep Chatterjee, Department of Physics
9. Prof. Aalok Misra , Department of physics
10. Prof. Thanga Raj Chelliah, Water Resources Development & Management

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MoE Funded Technical Institutions

Appendix 'A'
Item No. Senate / 101.3

The technical education system in the country can be broadly classified into three categories – Central Government funded institutions, State Government/State-funded institutions & Self-financed institutions. The Centrally funded institution of technical and science education are as under:

Indian Institute of Technology (IITs)	23
Indian Institute of Management (IIMs)	21
Indian Institute of Science (IISc)	1
Indian Institute of Science Education and Research (IISERs)	7
National Institute of Technology (NITs)	31
Indian Institute of Engineering Science and Technology, Shibpur	1
Indian Institute of Information Technology (IIITs) MoE funded – 5 PPP mode – 20	25
National Institute of Technical Teacher's Training & Research (NITTTRs)	4
School of Planning and Architecture (SPA)	3
North Eastern Regional Institute of Science and Technology (NERIST)	1
Sant Longowal Institute of Engineering and Technology (SLIET)	1
National Institute of Industrial Engineering (NITIE)	1
National Institute of Advance Manufacturing Technology (NIAMT)	1
Ghani Khan Choudhury Institute of Engineering & Technology (GKCIET)	1
Central Institute of Technology, Kokrajhar	1
Total	**122**

Besides the above, there are four Boards of Apprenticeship Training (BOATs).

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Appendix 'B'
Item No. Senate / 101.10

S. No.	Department/Centre/ School	S. No.	Programme	Model	Annexures	Page No.
1	Computer Science and Engg.	1	M.Tech. Computer Science and Engineering	2	A	15-18
2	Electrical Engg.	2	M.Tech. Instrumentation & Signal Processing	2 & 3	B	19-24
		3	M.Tech. Electric Drives and Power Electronics	2 & 3	B1	25-32
		4	M.Tech. Power System Engineering	1 (b), 2 & 3	B2	33-41
		5	M.Tech. Systems & Control	2 & 3	B3	42-49
		6	M.Tech. Electric Vehicle Technology	2 & 3	B4	50-57
3	Mechanical and Industrial Engg.	7	M.Tech. CAD, CAM and Robotics	2	C	58-62
		8	M.Tech. Machine Design Engineering	2	C1	63-66
		9	M.Tech. Production and Industrial Systems Engineering	2	C2	67-70
		10	M.Tech. Thermal Engineering	2	C3	71-74
		11	M.Tech. Additive and Joining Technologies	2	C4	75-78
4	Hydrology	12	M.Tech. Surface Water Hydrology	2	D	79-82
		13	M.Tech. Ground Water Hydrology	2	D1	83-86
		14	M.Tech. (Watershed Management	2	D2	87-90
5	Mehta Family School of Data Science and Artificial Intelligence	15	M.Tech. Artificial Intelligence	2	E	91-94
		16	M.Tech. Data Science	2	E1	95-98
6	Paper Technology	17	M.Tech. Packaging Technology	2	F	99-102
		18	M.Tech. Pulp and Paper Engineering	2	F1	103-106
7	Hydro and Renewable Energy	19	M.Tech. Renewable and Hydro Energy	2	G	107-110
		20	M.Tech. Environment Management of Rivers and Lakes	2	G1	111-113
8	Electronics and Communication Engineering	21	M.Tech. Communication Systems	2 & 3	H	114-120
		22	M.Tech. Microelectronics & VLSI	2 & 3	H1	121-128
		23	M.Tech. RF and Microwave Engineering	2 & 3	H2	129-136
		24	M.Tech. Terahertz Communication and Sensing	2 & 3	H3	137-143
9	Mathematics	25	M.Sc. Mathematics	1 (a)	I	144-148
10	Physics	26	M.Tech. Solid State Electronic Technology	2	J	149-152

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		27	M.Tech. Photonics	2	J1	153-156
		28	M.Sc. Physics	1 (a)	J2	157-161
11	Chemistry	29	M.Sc. Chemistry	1 (a)	K	162-166
12	Earth Sciences	30	M.Sc. Applied Geology	1 (a)	L	167-170
13	Architecture and Planning	31	M.Arch.	2	M	171-174
		32	MURP	2	M1	175-178
14	Management Studies	33	M.B.A[1]	1 (a)	N	179-189
15	Earthquake Engineering	34	M.Tech. Soil Dynamics	2	O	190-192
		35	M.Tech. Structural Dynamics	2	O1	193-195
		36	M.Tech. Seismic Vulnerability and Risk Assessment	2	O2	196-198
16	CTRANS	37	M.Tech. Transportation Systems Management[2]	2	P	199-202

Notes:

1. The IAPC noted that as per revised PG curriculum MBA comes under Model 1(b). However, the Department of Management Studies has requested to allow them to opt for Model 1 (a). The IAPC recommended the same.

2. The structure was approved by the Senate in its 100th meeting. The Centre has proposed minor revision in the structure. The IAPC recommended the revised structure.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Computer Science and Engineering)**
Department: **Department of Computer Science and Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	CSC-501	Advanced Algorithms	PCC	4	3	1	0	3	0
2.	CSC-503	Distributed Systems	PCC	4	3	1	0	3	0
3.	CSC-505	Machine Learning	PCC	4	3	1	0	3	0
4.	CSC-507	Programming Lab	PCC	3	0	0	6	0	6
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**17**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	CSC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Computer Science and Engineering)**
Department: **Department of Computer Science and Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	CSC-691	Internship Social Activity	ISA	4	-	-	-	-	-
2.	CSC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**14**					
Semester-II (Spring)									
1.	CSC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	17	21	14	14
Total Credits	**66**			

M.Tech. (Computer Science and Engineering)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	CSL-510	Network Programming	PEC	4	3	1	0	3	0
2.	CSL-511	Advanced Database Management Systems	PEC	4	3	1	0	3	0
3.	CSL-512	Formal Methods and Software Verification	PEC	4	3	1	0	3	0
4.	CSL-513	Information and Network Security	PEC	4	3	1	0	3	0
5.	CSL-514	Advanced Automata Theory	PEC	4	3	1	0	3	0
6.	CSL-515	Data Mining and Warehousing	PEC	4	3	1	0	3	0
7.	CSL-516	Modelling and Simulation	PEC	4	3	1	0	3	0
8.	CSL-517	Advanced Topics in Software Engineering	PEC	4	3	1	0	3	0
9.	CSL-518	Logic and Automated Reasoning	PEC	4	3	1	0	3	0
10.	CSL-519	Social Network Analysis	PEC	4	3	1	0	3	0
11.	CSL-520	Cloud Computing	PEC	4	3	1	0	3	0
12.	CSL-521	Mobile and Pervasive Computing	PEC	4	3	1	0	3	0
13.	CSL-522	Advanced Graph Theory	PEC	4	3	1	0	3	0
14.	CSL-523	Computational Geometry	PEC	4	3	1	0	3	0
15.	CSL-525	Computer Vision	PEC	4	3	1	0	3	0
16.	CSL-527	Internet of Things	PEC	4	3	1	0	3	0
17.	CSL-528	Natural Language Processing	PEC	4	3	1	0	3	0
18.	CSL-529	Advanced Computer Networks	PEC	4	3	1	0	3	0

19.	CSL-533	Advanced Operating Systems	PEC	4	3	1	0	3	0
20.	CSL-534	Advanced Data Structures	PEC	4	3	1	0	3	0
21.	CSL-535	Complexity Theory	PEC	4	3	1	0	3	0
22.	CSL-536	Distributed Algorithms	PEC	4	3	1	0	3	0
23.	CSL-537	Deep Learning	PEC	4	3	1	0	3	0
24.	CSL-524	Algorithms and Foundations of Chip Design	PEC	4	3	1	0	3	0
25.	CSL-476	Software Project Management	PEC	4	3	1	0	3	0
26.	CSL-538	Multimedia Technologies	PEC	4	3	1	0	3	0
27.	CSL-539	Quantum Computation	PEC	4	3	1	0	3	0
28.	CSL-530	Design and Analysis of Symmetric Cryptosystems	PEC	4	3	1	0	3	0
29.	CSL-531	Dynamic Graph Algorithms	PEC	4	3	1	0	3	0
30.	CSL-532	Data Stream Mining	PEC	4	3	1	0	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**	**Theory**	**Practical**
1.	CST-501	Programming in C/C++	STAR	3	3	0	0	3	0

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Instrumentation and Signal Processing)**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-531	Intelligent Sensors and Instrumentation	PCC	4	3	0	2	3	0
2.	EEC-533	Advances in Signal and Image Processing	PCC	4	3	0	2	3	0
3.	EEC-535	Concepts of Artificial Intelligence and Machine Learning	PCC	4	3	1	0	3	0
4.	EEC-537	Data Science and Instrumentation	PCC	4	3	0	2	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	EEC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Instrumentation and Signal Processing)**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	EEC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	EEC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

M.Tech. (Instrumentation and Signal Processing)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-514	AI applications in Signal Processing	PEC	4	3	1	0	3	0
2.	EEL-515	AI applications in Image Processing	PEC	4	3	1	0	3	0
3.	EEL-516	Bioelectric Signals and Processing	PEC	4	3	1	0	3	0
4.	EEL-517	FPGA Applications	PEC	4	3	1	0	3	0
5.	EEL-518	Medical Robotics	PEC	4	3	1	0	3	0
6.	EEL-519	Introduction to AI and ML tools	PEC	4	3	1	0	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EET-503	Medical Image Processing	STAR	3	2	0	2	3	0

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Instrumentation and Signal Processing**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-531	Intelligent Sensors and Instrumentation	PCC	4	3	0	2	3	0
2.	EEC-533	Advances in Signal and Image Processing	PCC	4	3	0	2	3	0
3.	EEC-535	Concepts of Artificial Intelligence and Machine Learning	PCC	4	3	1	0	3	0
4.	EEC-537	Data Science and Instrumentation	PCC	4	3	0	2	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.	EEC-751A	Thesis Stage-I	THESIS	14	-	-	-	-	-
		Total		**18**					

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DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Instrumentation and Signal Processing**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-751B	Thesis Stage-II	THESIS	15	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	EEC-751C	Thesis Stage-III	THESIS	16	-	-	-	-	-
		Total		**16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	18	15	16
Total Credits	**67**			

Master of Science (by Research) in Instrumentation and Signal Processing

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-514	AI applications in Signal Processing	PEC	4	3	1	0	3	0
2.	EEL-515	AI applications in Image Processing	PEC	4	3	1	0	3	0
3.	EEL-516	Bioelectric Signals and Processing	PEC	4	3	1	0	3	0
4.	EEL-517	FPGA Applications	PEC	4	3	1	0	3	0
5.	EEL-518	Medical Robotics	PEC	4	3	1	0	3	0
6.	EEL-519	Introduction to AI and ML tools	PEC	4	3	1	0	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EET-503	Medical Image Processing	STAR	3	2	0	2	3	0

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Electric Drives and Power Electronics)**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-511	Advanced Power Electronics	PCC	4	3	1	2/2	3	0
2.	EEC-513	Modeling and Analysis of Electrical Machines	PCC	4	3	0	2	3	0
3.	EEC-515	Power Electronic Controlled Drives	PCC	4	3	0	2	3	0
4.	EEC-517	Power Converters for Sustainable Energy	PCC	4	3	0	2	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	EEC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Electric Drives and Power Electronics)**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	EEC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	EEC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

M.Tech. (Electric Drives and Power Electronics)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-543	FACTS Devices	PEC	4	3	1	0	3	0
2.	EEL-641	Microcontroller and Its Applications to Power Converters	PEC	4	3	0	2	3	0
3.	EEL-647	Control Techniques in Power Electronics for AC Drives	PEC	4	3	0	2	3	0
4.	EEL-648	Pulse Width Modulation for Power Converters	PEC	4	3	1	0	3	0
5.	EEL-649	Enhanced Power Quality AC-DC Converters	PEC	4	3	0	2	3	0
6.	EEL-650	Switch Mode Power Supply	PEC	4	3	1	0	3	0
7.	EEL-651	Power Quality Improvement Techniques	PEC	4	3	0	2	3	0
8.	EEL-653	Selected Topics in Machines and Transformers	PEC	4	3	0	2	3	0
9.	EEL-654	Synchronous Machines and System Stability	PEC	4	3	1	0	3	0
10.	EEL-655	Special Machines	PEC	4	3	1	0	3	0
11.	EEL-673	Design of WBG Device based Power Converters	PEC	4	3	0	2	3	0
12.	EEL-634	High Power Converters for EV	PEC	4	3	1	0	3	0
13.	EEL-635	Digital Implementation for Power Electronics Systems	PEC	4	3	0	2	3	0
14.	EEL-502	Communication Techniques in Smart Grid	PEC	4	3	1	0	3	0
15.	EEL-542	Advanced Electric Drives	PEC	4	3	0	2/2	3	0
16.	EEL-506	Mathematical Modeling and Control of Power Converters	PEC	4	3	1	0	3	0
17.	EEL-643	Electric Drives for Hybrid Vehicles	PEC	4	3	1	0	3	0

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M.Tech. (Electric Drives and Power Electronics)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EET-501	Electric Drive for Modern Transport Systems	STAR	3	3	0	0	3	0

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DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Electric Drives and Power Electronics**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-511	Advanced Power Electronics	PCC	4	3	1	2/2	3	0
2.	EEC-513	Modeling and Analysis of Electrical Machines	PCC	4	3	0	2	3	0
3.	EEC-515	Power Electronic Controlled Drives	PCC	4	3	0	2	3	0
4.	EEC-517	Power Converters for Sustainable Energy	PCC	4	3	0	2	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.	EEC-751A	Thesis Stage-I	THESIS	14	-	-	-	-	-
		Total		**18**					

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Electric Drives and Power Electronics**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-751B	Thesis Stage-II	THESIS	15	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	EEC-751C	Thesis Stage-III	THESIS	16	-	-	-	-	-
		Total		**16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	18	15	16
Total Credits	**67**			

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Master of Science (by Research) in Electric Drives and Power Electronics

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-543	FACTS Devices	PEC	4	3	1	0	3	-
2.	EEL-641	Microcontroller and Its Applications to Power	PEC	4	3	0	2	3	-
3.	EEL-647	Control Techniques in Power Electronics for AC Drives	PEC	4	3	0	2	3	-
4.	EEL-648	Pulse Width Modulation for Power Converters	PEC	4	3	1	0	3	-
5.	EEL-649	Enhanced Power Quality AC-DC Converters	PEC	4	3	0	2	3	-
6.	EEL-650	Switch Mode Power Supply	PEC	4	3	1	0	3	-
7.	EEL-651	Power Quality Improvement Techniques	PEC	4	3	0	2	3	-
8.	EEL-653	Selected Topics in Machines	PEC	4	3	0	2	3	-
9.	EEL-654	Synchronous Machines and System Stability	PEC	4	3	1	0	3	-
10.	EEL-655	Special Machines	PEC	4	3	1	0	3	-
11.	EEL-673	Design of WBG Device based Power Converters	PEC	4	3	0	2	3	-
12.	EEL-634	High Power Converters for EV	PEC	4	3	1	0	3	-
13.	EEL-635	Digital Implementation for Power Electronics Systems	PEC	4	3	0	2	3	-
14.	EEL-502	Communication Techniques in Smart Grid	PEC	4	3	1	0	3	-
15.	EEL-542	Advanced Electric Drives	PEC	4	3	0	2/2	3	-
16.	EEL-506	Mathematical modeling and Control of Power Converters	PEC	4	3	1	0	3	-
17.	EEL-643	Electric Drives for Hybrid Vehicles	PEC	4	3	1	0	3	-

Master of Science (by Research) in Electric Drives and Power Electronics

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EET-501	Electric Drive for Modern Transport Systems	STAR	3	3	0	0	3	0

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Electrical Engineering)/(Power System Engineering)**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **1-B**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-501	Computer Aided Power System Analysis	PCC	4	3	0	2	3	0
2.	EEC-503	Power System Operation and Control	PCC	4	3	0	2	3	0
3.	EEC-505	HVDC Transmission Systems	PCC	4	3	1	0	3	0
4.	EEC-507	Advanced Digital Protection	PCC	4	3	0	2	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	EEC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Electrical Engineering)/(Power System Engineering)**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **1-B**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.		Program Elective-V	PPI	4	-	-	-	-	-
3.		Program Elective-VI	PPI	4	-	-	-	-	-
4.		Interdisciplinary Course-I	PPI	4	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	EEC-601	Project	PROJECT	4	-	-	-	-	-
2.		Program Elective-VII	PPI	4	-	-	-	-	-
3.		Program Elective-VIII	PPI	4	-	-	-	-	-
		Total		**12**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	15	12
Total Credits	**66**			

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XXX M.Tech. (Electrical Engineering)/(Power System Engineering)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-661	Power System Planning	PEC	4	3	1	0	3	0
2.	EEL-667	Power System Reliability	PEC	4	3	1	0	3	0
3.	EEL-663	Flexible AC Transmission Systems	PEC	4	3	1	0	3	0
4.	EEL-669	Power System Dynamics	PEC	4	3	0	2	3	0
5.	EEL-670	Substation Automation	PEC	4	3	1	0	3	0
6.	EEL-671	Power System Deregulation	PEC	4	3	1	0	3	0
7.	EEL-612	Electrical Transient in Power System	PEC	4	3	1	0	3	0
8.	EEL-672	Smart Grid Technologies	PEC	4	3	0	2	3	0
9.	EEL-695	Modelling and Control of Sustainable Energy Systems	PEC	4	3	1	0	3	0
10.	EEL-520	Cyber Physical Power System	PEC	4	3	0	2	3	0
11.	EEL-513	Microgrid Systems	PEC	4	3	0	2	3	0
12.	EEL-522	AI Techniques to Power System	PEC	4	3	0	2	3	0
13.	EEL-523	Synchro-phasor Technology	PEC	4	3	0	2	3	0
14.	EEL-524	Power System State Estimation	PEC	4	3	0	2	3	0

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DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Power System Engineering)**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-501	Computer Aided Power System Analysis	PCC	4	3	0	2	3	0
2.	EEC-503	Power System Operation and Control	PCC	4	3	0	2	3	0
3.	EEC-505	HVDC Transmission Systems	PCC	4	3	1	0	3	0
4.	EEC-507	Advanced Digital Protection	PCC	4	3	0	2	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	EEC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Power System Engineering)**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	EEC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	EEC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

M.Tech. (Power System Engineering)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-661	Power System Planning	PEC	4	3	1	0	3	0
2.	EEL-667	Power System Reliability	PEC	4	3	1	0	3	0
3.	EEL-663	Flexible AC Transmission Systems	PEC	4	3	1	0	3	0
4.	EEL-669	Power System Dynamics	PEC	4	3	0	2	3	0
5.	EEL-670	Substation Automation	PEC	4	3	1	0	3	0
6.	EEL-671	Power System Deregulation	PEC	4	3	1	0	3	0
7.	EEL-612	Electrical Transient in Power System	PEC	4	3	1	0	3	0
8.	EEL-672	Smart Grid Technologies	PEC	4	3	0	2	3	0
9.	EEL-695	Modelling and Control of Sustainable Energy Systems	PEC	4	3	1	0	3	0
10.	EEL-520	Cyber Physical Power System	PEC	4	3	0	2	3	0
11.	EEL-513	Microgrid Systems	PEC	4	3	0	2	3	0
12.	EEL-522	AI Techniques to Power System	PEC	4	3	0	2	3	0
13.	EEL-523	Synchro-phasor Technology	PEC	4	3	0	2	3	0
14.	EEL-524	Power System State Estimation	PEC	4	3	0	2	3	0

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Power System Engineering**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-501	Computer Aided Power System Analysis	PCC	4	3	0	2	3	0
2.	EEC-503	Power System Operation and Control	PCC	4	3	0	2	3	0
3.	EEC-505	HVDC Transmission Systems	PCC	4	3	1	0	3	0
4.	EEC-507	Advanced Digital Protection	PCC	4	3	0	2	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.	EEC-751A	Thesis Stage-I	THESIS	14	-	-	-	-	-
		Total		**18**					

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DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Power System Engineering**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-751B	Thesis Stage-II	THESIS	15	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	EEC-751C	Thesis Stage-III	THESIS	16	-	-	-	-	-
		Total		**16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	18	15	16
Total Credits	**67**			

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Master of Science (by Research) in Power System Engineering

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-661	Power System Planning	PEC	4	3	1	0	3	0
2.	EEL-667	Power System Reliability	PEC	4	3	1	0	3	0
3.	EEL-663	Flexible AC Transmission Systems	PEC	4	3	1	0	3	0
4.	EEL-669	Power System Dynamics	PEC	4	3	0	2	3	0
5.	EEL-670	Substation Automation	PEC	4	3	1	0	3	0
6.	EEL-671	Power System Deregulation	PEC	4	3	1	0	3	0
7.	EEL-612	Electrical Transient in Power System	PEC	4	3	1	0	3	0
8.	EEL-672	Smart Grid Technologies	PEC	4	3	0	2	3	0
9.	EEL-695	Modelling and Control of Sustainable Energy Systems	PEC	4	3	1	0	3	0
10.	EEL-520	Cyber Physical Power System	PEC	4	3	0	2	3	0
11.	EEL-513	Microgrid Systems	PEC	4	3	0	2	3	0
12.	EEL-522	AI Techniques to Power System	PEC	4	3	0	2	3	0
13.	EEL-523	Synchro-phasor Technology	PEC	4	3	0	2	3	0
14.	EEL-524	Power System State Estimation	PEC	4	3	0	2	3	0

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Systems and Control)**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
		Semester-I (Autumn)							
1.	EEC-541	Mathematics for Systems and Control	PCC	4	3	1	0	3	0
2.	EEC-543	Advanced Linear Control Systems	PCC	4	3	1	0	3	0
3.	EEC-545	Nonlinear Systems and Control	PCC	4	3	1	0	3	0
4.	EEC-547	Control System Design Laboratory	PCC	3	0	0	6	0	3
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**17**					
		Semester-II (Spring)							
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	EEC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Systems and Control)**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
		Semester-I (Autumn)							
1.	EEC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	EEC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
		Semester-II (Spring)							
1.	EEC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	17	21	13	14
Total Credits	**65**			

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M.Tech. (Systems and Control)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-508	Machine Learning	PEC	4	3	1	0	3	0
2.	EEL-681	Wide Area System Monitoring Control	PEC	4	3	1	0	3	0
3.	EEL-682	Advanced Digital System Design	PEC	4	3	0	2	3	0
4.	EEL-683	Introduction to Robotics	PEC	4	3	1	0	3	0
5.	EEL-685	Stochastic Systems	PEC	4	3	1	0	3	0
6.	EEL-686	Optimal Control	PEC	4	3	1	0	3	0
7.	EEL-687	Operation Research	PEC	4	3	1	0	3	0
8.	EEL-688	Interval Control Systems	PEC	4	3	1	0	3	0
9.	EEL-689	Modeling and Simulation	PEC	4	3	1	0	3	0
10.	EEL-692	Graph Theory and Applications	PEC	4	3	1	0	3	0
11.	EEL-615	Robust Control	PEC	4	3	1	0	3	0
12.	EEL-694	Advances in Model Order Reduction Techniques	PEC	4	3	1	0	3	0
13.	EEL-696	Intelligent Control of Robotic Systems	PEC	4	3	0	2/2	3	0
14.	EEL-697	Dynamics and Control of Autonomous Vehicles	PEC	4	3	1	2/2	3	0
15.	EEL-525	Sampled-Data Systems	PEC	4	3	1	0	3	0
16.	EEL-613	Sliding Mode Control and Observation	PEC	4	3	1	0	3	0
17.	EEL-620	Process Instrumentation and Control	PEC	4	3	0	2	3	0
18.	EEL-526	Set-Theoretic Methods in Control	PEC	4	3	1	0	3	0
19.	EEL-527	Behavioral Approach to Systems Theory	PEC	4	3	1	0	3	0

20.	EEL-528	Model Predictive Control	PEC	4	3	1	0	3	0
21.	EEL-529	Learning Based Control of Robotics	PEC	4	3	0	2/2	3	0
22.	EEL-530	Advances in PID Controller and its Applications	PEC	4	3	1	2/2	3	0
23.	EEL-531	Data driven methods in Control	PEC	4	3	1	0	3	0
24.	EEL-532	Data Structure and its Applications	PEC	4	3	0	2	3	0
25.	EEL-684	System Reliability	PEC	4	3	1	0	3	0
26.	EEL-533	Advanced Microprocessor and Applications	PEC	4	3	0	2	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EET-504	Data Structures	STAR	3	2	0	2	3	0
2.	EET-505	Programming in C++	STAR	3	2	0	2	3	0
3.	EET-506	Reinforcement Learning based Control System Design	STAR	3	2	1	0	3	0
4.	EET-507	Control Theory and its Applications in Renewable Energy Systems	STAR	3	2	1	0	3	0
5.	EET-508	Advanced Robotics	STAR	3	2	0	2	3	0
6.	EET-509	Embedded System Design using FPGA	STAR	3	2	0	2	2	0

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Systems and Control**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-541	Mathematics for Systems and Control	PCC	4	3	1	0	3	0
2.	EEC-543	Advanced Linear Control Systems	PCC	4	3	1	0	3	0
3.	EEC-545	Nonlinear Systems and Control	PCC	4	3	1	0	3	0
4.	EEC-547	Control System Design Laboratory	PCC	3	0	0	6	0	3
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**17**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.	EEC-751A	Thesis Stage-I	THESIS	14	-	-	-	-	-
		Total		**18**					

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Systems and Control**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-751B	Thesis Stage-II	THESIS	15	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	EEC-751C	Thesis Stage-III	THESIS	16	-	-	-	-	-
		Total		**16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	17	18	15	16
Total Credits	**66**			

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Master of Science (by Research) in Systems and Control

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-508	Machine Learning	PEC	4	3	1	0	3	0
2.	EEL-681	Wide Area System Monitoring Control	PEC	4	3	1	0	3	0
3.	EEL-682	Advanced Digital System Design	PEC	4	3	0	2	3	0
4.	EEL-683	Introduction to Robotics	PEC	4	3	1	0	3	0
5.	EEL-685	Stochastic Systems	PEC	4	3	1	0	3	0
6.	EEL-686	Optimal Control	PEC	4	3	1	0	3	0
7.	EEL-687	Operation Research	PEC	4	3	1	0	3	0
8.	EEL-688	Interval Control Systems	PEC	4	3	1	0	3	0
9.	EEL-689	Modeling and Simulation	PEC	4	3	1	0	3	0
10.	EEL-692	Graph Theory and Applications	PEC	4	3	1	0	3	0
11.	EEL-615	Robust Control	PEC	4	3	1	0	3	0
12.	EEL-694	Advances in Model Order Reduction Techniques	PEC	4	3	1	0	3	0
13.	EEL-696	Intelligent Control of Robotic Systems	PEC	4	3	0	2/2	3	0
14.	EEL-697	Dynamics and Control of Autonomous Vehicles	PEC	4	3	1	2/2	3	0
15.	EEL-525	Sampled-Data Systems	PEC	4	3	1	0	3	0
16.	EEL-613	Sliding Mode Control and Observation	PEC	4	3	1	0	3	0
17.	EEL-620	Process Instrumentation and Control	PEC	4	3	0	2	3	0

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18.	EEL-526	Set-Theoretic Methods in Control	PEC	4	3	1	0	3	0
19.	EEL-527	Behavioral Approach to Systems Theory	PEC	4	3	1	0	3	0
20.	EEL-528	Model Predictive Control	PEC	4	3	1	0	3	0
21.	EEL-529	Learning Based Control of Robotics	PEC	4	3	0	2/2	3	0
22.	EEL-530	Advances in PID Controller and its Applications	PEC	4	3	1	2/2	3	0
23.	EEL-531	Data driven methods in Control	PEC	4	3	1	0	3	0
24.	EEL-532	Data Structure and its Applications	PEC	4	3	0	2	3	0
25.	EEL-684	System Reliability	PEC	4	3	1	0	3	0
26.	EEL-533	Advanced Microprocessor and Applications	PEC	4	3	0	2	3	0

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Electric Vehicle Technology)**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-521	Electric Vehicles: Power Train and Drives	PCC	4	3	0	2	3	0
2.	EEC-523	Energy Storage Techniques	PCC	3	3	0	0	3	0
3.	EEC-525	Charging Infrastructure	PCC	4	3	0	2	3	0
4.	EEC-527	Control Systems for Electric Vehicle	PCC	4	3	0	2	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**17**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	EEC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Electric Vehicle Technology)**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	EEC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	EEC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	17	21	13	14
Total Credits	**65**			

M.Tech. (Electric Vehicle Technology)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-641	Microcontroller and Its Applications to Power Converters	PEC	4	3	0	2	3	0
2.	EEL-542	Advanced Electric Drives	PEC	4	3	0	2	3	0
3.	EEL-643	Electric Drives for Hybrid Vehicles	PEC	4	3	1	0	3	0
4.	EEL-647	Control Techniques in Power Electronics for AC Drives	PEC	4	3	0	2	3	0
5.	EEL-648	Pulse Width Modulation for Power Converters	PEC	4	3	1	0	3	0
6.	EEL-650	Switch Mode Power Supply	PEC	4	3	1	0	3	0
7.	EEL-655	Special Machines	PEC	4	3	1	0	3	0
8.	EEL-611	FPGA Implementation of Signal Processing Systems	PEC	4	3	0	2	3	0
9.	EEL-673	Design of WBG Device based Power Converters	PEC	4	3	0	2	3	0
10.	EEL-508	Machine Learning	PEC	4	3	1	0	3	0
11.	EEL-682	Advanced Digital System Design	PEC	4	3	0	2	3	0
12.	EEL-697	Dynamics and Control of Autonomous Vehicles	PEC	4	3	1	2/2	3	0
13.	EEL-672	Smart Grid Technology	PEC	4	3	0	2	3	0
14.	EEL-510	Digital Control Implementation for Power Converters	PEC	4	3	0	2	3	0
15.	EEL-634	High Power Converters for EV	PEC	4	3	1	0	3	0
16.	EEL-695	Modelling and Control of Sustainable Energy Systems	PEC	4	3	1	0	3	0
17.	EEL-694	Advances in Model Order Reduction Techniques	PEC	4	3	1	0	3	0
18.	EEL-613	Sliding Mode Control and Observation	PEC	4	3	1	0	3	0

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19.	EEL-512	Low voltage systems for EVs	PEC	4	3	1	0	3	0
20.	EEL-513	Microgrid systems	PEC	4	3	0	2	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EET-502	Electric Vehicle Systems	STAR	3	3	0	0	3	0

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Electric Vehicle Technology**
Department: **Department of Electrical Engineering**
Year: **I**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-521	Electric Vehicles: Power Train and Drives	PCC	4	3	0	2	3	0
2.	EEC-523	Energy Storage Techniques	PCC	3	3	0	0	3	0
3.	EEC-525	Charging Infrastructure	PCC	4	3	0	2	3	0
4.	EEC-527	Control Systems for Electric Vehicle	PCC	4	3	0	2	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**17**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.	EEC-751A	Thesis Stage-I	THESIS	14	-	-	-	-	-
		Total		**18**					

DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Electric Vehicle Technology**
Department: **Department of Electrical Engineering**
Year: **II**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EEC-751B	Thesis Stage-II	THESIS	15	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	EEC-751C	Thesis Stage-III	THESIS	16	-	-	-	-	-
		Total		**16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	17	18	15	16
Total Credits	**66**			

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Master of Science (by Research) in Electric Vehicle Technology

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EEL-641	Microcontroller and Its Applications to Power Converters	PEC	4	3	0	2	3	0
2.	EEL-542	Advanced Electric Drives	PEC	4	3	0	2	3	0
3.	EEL-643	Electric Drives for Hybrid Vehicles	PEC	4	3	1	0	3	0
4.	EEL-647	Control Techniques in Power Electronics for AC Drives	PEC	4	3	0	2	3	0
5.	EEL-648	Pulse Width Modulation for Power Converters	PEC	4	3	1	0	3	0
6.	EEL-650	Switch Mode Power Supply	PEC	4	3	1	0	3	0
7.	EEL-655	Special Machines	PEC	4	3	1	0	3	0
8.	EEL-611	FPGA Implementation of Signal Processing Systems	PEC	4	3	0	2	3	0
9.	EEL-673	Design of WBG Device based Power Converters	PEC	4	3	0	2	3	0
10.	EEL-508	Machine Learning	PEC	4	3	1	0	3	0
11.	EEL-682	Advanced Digital System Design	PEC	4	3	0	2	3	0
12.	EEL-697	Dynamics and Control of Autonomous Vehicles	PEC	4	3	1	2/2	3	0
13.	EEL-672	Smart Grid Technology	PEC	4	3	0	2	3	0
14.	EEL-510	Digital Control Implementation for Power Converters	PEC	4	3	0	2	3	0
15.	EEL-634	High Power Converters for EV	PEC	4	3	1	0	3	0
16.	EEL-695	Modelling and Control of Sustainable Energy Systems	PEC	4	3	1	0	3	0
17.	EEL-694	Advances in Model Order Reduction Techniques	PEC	4	3	1	0	3	0

18.	EEL-613	Sliding Mode Control and Observation	PEC	4	3	1	0	3	0
19.	EEL-512	Low voltage systems for EVs	PEC	4	3	1	0	3	0
20.	EEL-513	Microgrid systems	PEC	4	3	0	2	3	0

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DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (CAD, CAM and Robotics)**
Department: **Department of Mechanical and Industrial Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MIC-501	Measurements and Instrumentation	PCC	4	3	0	2	3	0
2.	MIC-503	Finite Element Methods	PCC	4	3	0	2	3	0
3.	MIC-505	Numerical Methods for Engineers	PCC	4	3	1	0	3	0
4.	MIC-507	Continuum Mechanics	PCC	4	3	1	0	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	MIC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (CAD, CAM and Robotics)**
Department: **Department of Mechanical and Industrial Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MIC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	MIC-701A	Thesis Stage-I	Thesis	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	MIC-701B	Thesis Stage-II	Thesis	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

M.Tech. (CAD, CAM and Robotics)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIL-621	Instrumentation and Experimental Methods	PEC	4	3	1	2/2	3	0
2.	MIL-503	Computer Aided Manufacturing	PEC	4	3	1	0	3	0
3.	MIL-502	Robotics and Control	PEC	4	3	1	2/2	3	0
4.	MIL-508	Advanced Automatic Control	PEC	4	3	1	0	3	0
5.	MIL-509	Extended Finite Element Methods	PEC	4	3	1	0	3	0
6.	MIL-515	Manufacturing System Analysis	PEC	4	3	1	0	3	0
7.	MIL-516	Artificial Intelligence	PEC	4	3	1	0	3	0
8.	MIL-517	Automated Materials Handling Systems	PEC	4	3	1	0	3	0
9.	MIL-527	Computational Fluid Dynamics & Heat Transfer	PEC	4	3	1	0	3	0
10.	MIL-547	Product and Process Optimization	PEC	4	3	1	0	3	0
11.	MIL-550	Advanced Machine Design	PEC	4	3	1	0	3	0
12.	MIL-551	Dynamics of Mechanical Systems	PEC	4	3	1	0	3	0
13.	MIL-552	Advanced Mechanics of Solids	PEC	4	3	1	0	3	0
14.	MIL-554	Computer Aided Mechanism Design	PEC	4	3	1	2/2	3	0
15.	MIL-557	Finite Element Methods	PEC	4	3	1	0	3	0
16.	MIL-558	Fracture Mechanics	PEC	4	3	1	0	3	0
17.	MIL-559	Computer Aided Design	PEC	4	3	1	2/2	3	0
18.	MIL-560	Mechanics of Composite Materials	PEC	4	3	1	0	3	0

19.	MIL-561	Advanced Mechanical Vibrations	PEC	4	3	1	2/2	3	0
20.	MIL-563	Mechatronics	PEC	4	3	1	2/2	3	0
21.	MIL-565	Smart Materials, Structures, and Devices	PEC	4	3	1	0	3	0
22.	MIL-566	Computer Aided Analysis of Mechanical Systems	PEC	4	3	1	0	3	0
23.	MIL-567	Computer Graphics	PEC	4	3	1	2/2	3	0
24.	MIL-568	Advanced Robotics	PEC	4	3	1	2/2	3	0
25.	MIL-504	Mechanics of Soft Materials	PEC	4	3	1	0	3	0
26.	MIL-505	Statistical Machine Learning	PEC	4	3	1	0	3	0
27.	MIL-506	Elastic Waves in Solids	PEC	4	3	1	0	3	0
28.	MIL-507	Isogeometric Analysis	PEC	4	3	1	2	3	0
29.	MIL-510	Shock Phenomena	PEC	4	3	1	0	3	0
30.	MIL-511	Materials Behaviors under Extreme Conditions	PEC	4	3	1	0	3	0
31.	MIL-512	Introduction to Biomechanics	PEC	4	3	1	2/2	3	0
32.	MIL-513	Impact Mechanics	PEC	4	3	1	2/2	3	0
33.	MIL-417	Energy and Variational Principles in Engineering Mechanics	PEC	4	3	1	0	3	0
34.	MIL-608	Fatigue in Structures & Materials	PEC	4	3	1	2/2	3	0
Students should mandatorily earn a minimum of 3 credits from practical components in a program. These practical components can be part of a course or a dedicated practical /laboratory course.									

M.Tech. (CAD, CAM and Robotics)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIT-501	Value Engineering	STAR	3	2	1	0	3	0

DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Machine Design Engineering)**
Department: **Department of Mechanical and Industrial Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MIC-501	Measurements and Instrumentation	PCC	4	3	0	2	3	0
2.	MIC-503	Finite Element Methods	PCC	4	3	0	2	3	0
3.	MIC-505	Numerical Methods for Engineers	PCC	4	3	1	0	3	0
4.	MIC-507	Continuum Mechanics	PCC	4	3	1	0	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	MIC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Machine Design Engineering)**
Department: **Department of Mechanical and Industrial Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MIC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	MIC-701A	Thesis Stage-I	Thesis	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	MIC-701B	Thesis Stage-II	Thesis	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

M.Tech. (Machine Design Engineering)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIL-621	Instrumentation and Experimental Methods	PEC	4	3	1	2/2	3	0
2.	MIL-502	Robotics and Control	PCC	4	3	1	2/2	3	0
3.	MIL-508	Advanced Automatic Control	PEC	4	3	1	0	3	0
4.	MIL-509	Extended Finite Element Methods	PEC	4	3	1	0	3	0
5.	MIL-550	Advanced Machine Design	PEC	4	3	1	0	3	0
6.	MIL-551	Dynamics of Mechanical Systems	PEC	4	3	1	0	3	0
7.	MIL-552	Advanced Mechanics of Solids	PEC	4	3	1	0	3	0
8.	MIL-547	Product and Process Optimization	PEC	4	3	1	0	3	0
9.	MIL-553	Industrial Tribology	PEC	4	3	1	0	3	0
10.	MIL-554	Computer Aided Mechanism Design	PEC	4	3	1	2/2	3	0
11.	MIL-555	Experimental Stress Analysis	PEC	4	3	1	2/2	3	0
12.	MIL-556	Dynamics of Road Vehicles	PEC	4	3	1	2/2	3	0
13.	MIL-557	Finite Element Methods	PEC	4	3	1	0	3	0
14.	MIL-558	Fracture Mechanics	PEC	4	3	1	0	3	0
15.	MIL-559	Computer Aided Design	PEC	4	3	1	2/2	3	0
16.	MIL-560	Mechanics of Composite Materials	PEC	4	3	1	0	3	0
17.	MIL-561	Advanced Mechanical Vibrations	PEC	4	3	1	2/2	3	0
18.	MIL-562	Noise Control in Mechanical Systems	PEC	4	3	1	2/2	3	0

19.	MIL-563	Mechatronics	PEC	4	3	1	2/2	3	0
20.	MIL-565	Smart Materials, Structures, and Devices	PEC	4	3	1	0	3	0
21.	MIL-602	Bond Graph Modelling of Engineering Systems	PEC	4	3	1	2/2	3	0
22.	MIL-504	Mechanics of Soft Materials	PEC	4	3	1	0	3	0
23.	MIL-505	Statistical Machine Learning	PEC	4	3	1	0	3	0
24.	MIL-506	Elastic Waves in Solids	PEC	4	3	1	0	3	0
25.	MIL-507	Isogeometric Analysis	PEC	4	3	0	2	3	0
26.	MIL-510	Shock Phenomena	PEC	4	3	1	0	3	0
27.	MIL-511	Materials Behaviors under Extreme Conditions	PEC	4	3	1	0	3	0
28.	MIL-608	Fatigue in Structures & Materials	PEC	4	3	1	2/2	3	0
29.	MIL-512	Introduction to Biomechanics	PEC	4	3	1	2/2	3	0
30.	MIL-513	Impact Mechanics	PEC	4	3	1	2/2	3	0
31.	MIL-417	Energy and Variational Principles in Engineering Mechanics	PEC	4	3	1	0	3	0
Students should mandatorily earn a minimum of 3 credits from practical components in a program. These practical components can be part of a course or a dedicated practical /laboratory course.									

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIT-501	Value Engineering	STAR	3	2	1	0	3	0

DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Production and Industrial Systems Engineering)**
Department: **Department of Mechanical and Industrial Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MIC-501	Measurements and Instrumentation	PCC	4	3	0	2	3	0
2.	MIC-503	Finite Element Methods	PCC	4	3	0	2	3	0
3.	MIC-505	Numerical Methods for Engineers	PCC	4	3	1	0	3	0
4.	MIC-507	Continuum Mechanics	PCC	4	3	1	0	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	MIC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Production and Industrial Systems Engineering)**
Department: **Department of Mechanical and Industrial Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MIC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	MIC-701A	Thesis Stage-I	Thesis	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	MIC-701B	Thesis Stage-II	Thesis	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

M.Tech. (Production and Industrial Systems Engineering)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIL-514	Operations Management	PEC	4	3	1	0	3	0
2.	MIL-633	Quality Management	PEC	4	3	1	0	3	0
3.	MIL-572	Advanced Manufacturing Processes	PEC	4	3	1	2/2	3	0
4.	MIL-575	Product Design and Development	PEC	4	3	1	0	3	0
5.	MIL-582	Flexible Manufacturing Systems	PEC	4	3	1	0	3	0
6.	MIL-583	Materials Management	PEC	4	3	1	0	3	0
7.	MIL-584	Operations Research	PEC	4	3	1	0	3	0
8.	MIL-585	Supply Chain Management	PEC	4	3	1	0	3	0
9.	MIL-586	Metal Forming	PEC	4	3	1	0	3	0
10.	MIL-587	Metal Casting	PEC	4	3	1	2/2	3	0
11.	MIL-588	Non-traditional Machining Processes	PEC	4	3	1	2/2	3	0
12.	MIL-607	Processing of Non-metals	PEC	4	3	1	0	3	0
13.	MIL-606	Numerical Methods in Manufacturing	PEC	4	3	1	0	3	0
14.	MIL-599	Surface Engineering	PEC	4	3	1	2/2	3	0
15.	MIL-601	Additive Manufacturing	PEC	4	3	1	2/2	3	0
16.	MIL-518	Forming of Sheet Metals	PEC	4	3	1	2/2	3	0
Students should mandatorily earn a minimum of 3 credits from practical components in a program. These practical components can be part of a course or a dedicated practical /laboratory course.									

M.Tech. (Production and Industrial Systems Engineering)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIT-501	Value Engineering	STAR	3	2	1	0	3	0

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DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Thermal Engineering)**
Department: **Department of Mechanical and Industrial Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MIC-501	Measurements and Instrumentation	PCC	4	3	0	2	3	0
2.	MIC-503	Finite Element Methods	PCC	4	3	0	2	3	0
3.	MIC-505	Numerical Methods for Engineers	PCC	4	3	1	0	3	0
4.	MIC-507	Continuum Mechanics	PCC	4	3	1	0	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	MIC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Thermal Engineering)**
Department: **Department of Mechanical and Industrial Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MIC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	MIC-701A	Thesis Stage-I	Thesis	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	MIC-701B	Thesis Stage-II	Thesis	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

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M.Tech. (Thermal Engineering)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIL-519	Modeling and Simulation	PEC	4	3	1	2/2	3	0
2.	MIL-520	Advanced Thermodynamics	PEC	4	3	1	0	3	0
3.	MIL-521	Advanced Fluid Mechanics	PEC	4	3	1	0	3	0
4.	MIL-522	Advanced Heat Transfer	PEC	4	3	1	0	3	0
5.	MIL-527	Computational Fluid Dynamics & Heat Transfer	PEC	4	3	1	0	3	0
6.	MIL-523	Gas Turbines & Compressors	PEC	4	3	1	0	3	0
7.	MIL-524	Two Phase Flow & Heat Transfer	PEC	4	3	1	0	3	0
8.	MIL-525	Solar Energy	PEC	4	3	1	0	3	0
9.	MIL-632	Advanced Gas Dynamics	PEC	4	3	1	0	3	0
10.	MIL-528	Boundary Layer Theory	PEC	4	3	1	0	3	0
11.	MIL-529	Turbulent Flows	PEC	4	3	1	0	3	0
12.	MIL-531	Hydro-dynamic Machines	PEC	4	3	1	2/2	3	0
13.	MIL-532	Renewable Energy Systems	PEC	4	3	1	2/2	3	0
14.	MIL-533	Refrigeration & Air-Conditioning System Design	PEC	4	3	1	2/2	3	0
15.	MIL-536	Convective Heat and Mass Transfer	PEC	4	3	1	0	3	0
16.	MIL-537	I. C. Engines	PEC	4	3	1	2/2	3	0
17.	MIL-538	I. C. Engine Combustion Processes Modelling	PEC	4	3	1	2/2	3	0
18.	MIL-539	Micro and Nano Scale Thermal Engineering	PEC	4	3	1	0	3	0

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19.	MIL-540	Combustion	PEC	4	3	1	2/2	3	0
20.	MIL-541	Bio-Fluid Mechanics	PEC	4	3	1	0	3	0
21.	MIL-542	Energy Management	PEC	4	3	1	0	3	0
22.	MIL-543	Fluid Power Systems	PEC	4	3	1	0	3	0
23.	MIL-544	Design of Heat Exchangers	PEC	4	3	1	0	3	0
24.	MIL-545	Fuel Cells	PEC	4	3	1	0	3	0
25.	MIL-546	Thermal Management of Energy Storage Devices	PEC	4	3	1	0	3	0
26.	MIL-548	Hydrogen Energy	PEC	4	3	1	0	3	0
27.	MIL-604	Fire Dynamics	PEC	4	3	1	0	3	0
28.	MIL-549	Aircraft Propulsion	PEC	4	3	1	0	3	0
29.	MIL-612	Hydrodynamic Stability	PEC	4	3	1	0	3	0
Students should mandatorily earn a minimum of 3 credits from practical components in a program. These practical components can be part of a course or a dedicated practical /laboratory course.									

Science, Technology, and Advanced Research-tools basket

Teaching Scheme								Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical			
1.	MIT-501	Value Engineering	STAR	3	2	1	0	3	0			

DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Additive and Joining Technologies)**
Department: **Department of Mechanical and Industrial Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MIC-501	Measurements and Instrumentation	PCC	4	3	0	2	3	0
2.	MIC-503	Finite Element Methods	PCC	4	3	0	2	3	0
3.	MIC-505	Numerical Methods for Engineers	PCC	4	3	1	0	3	0
4.	MIC-507	Continuum Mechanics	PCC	4	3	1	0	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	MIC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Additive and Joining Technologies)**
Department: **Department of Mechanical and Industrial Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MIC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	MIC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	MIC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

M.Tech. (Additive and Joining Technologies)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIL-601	Additive Manufacturing	PEC	4	3	1	2/2	3	0
2.	MIL-613	Fusion Joining Technologies	PEC	4	3	1	2/2	3	0
3.	MIL-614	Solid State Joining Technologies	PEC	4	3	1	2/2	3	0
4.	MIL-615	Material Characterization & Testing	PEC	4	3	1	2/2	3	0
5.	MIL-599	Surface Engineering	PEC	4	3	1	2/2	3	0
6.	MIL-610	Laser Material Processing	PEC	4	3	1	0	3	0
7.	MIL-622	Metallurgical aspects in Joining and Additive Manufacturing	PEC	4	3	1	2/2	3	0
8.	MIL-624	Design and Analysis of Joints	PEC	4	3	1	2/2	3	0
9.	MIL-501	Failure Analysis and Prevention Joints	PEC	4	3	1	2/2	3	0
10.	MIL-627	Hybrid Joining Technologies	PEC	3	2	1	0	3	0
11.	MIL-629	Reverse Engineering and Rapid Tooling	PEC	3	2	0	2/2	3	0
12.	MIL-631	Dissimilar Metal Joining	PEC	4	3	1	0	3	0
Students should mandatorily earn a minimum of 3 credits from practical components in a program. These practical components can be part of a course or a dedicated practical /laboratory course.									

M.Tech. (Additive and Joining Technologies)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MIT-501	Value Engineering	STAR	3	2	1	0	3	0

DEPARTMENT OF HYDROLOGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Surface Water Hydrology)/PG Diploma in Surface Water Hydrology**
Department: **Department of Hydrology**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	HYC-501	Open Channel and Fluvial Hydraulics	PCC	3	2	0	2	3	0
2.	HYC-503	Stochastic Hydrology	PCC	3	2	1	0	3	0
3.	HYC-505	Remote Sensing and GIS Applications	PCC	3	2	0	2	3	0
4.	HYC-507	Deterministic Hydrology	PCC	3	2	1	0	3	0
5.	HYC-509	Surface Water Quality Modelling	PCC	3	2	0	2	3	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**17**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	3	-	-	-	-	-
2.		Program Elective-II	PEC	3	-	-	-	-	-
3.		Program Elective-III	PEC	3	-	-	-	-	-
4.		Program Elective-IV	PEC	3	-	-	-	-	-
5.		Program Elective-V	PEC	3	-	-	-	-	-
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	HYC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**20**					

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DEPARTMENT OF HYDROLOGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Surface Water Hydrology)/PG Diploma in Surface Water Hydrology**
Department: **Department of Hydrology**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	HYC-691	Internship Social Activity	ISA	5	-	-	-	-	-
2.	HYC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	HYC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	17	20	15	14
Total Credits	**66**			

M.Tech. (Surface Water Hydrology)/PG Diploma in Surface Water Hydrology

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HYL-501	Water Resources Planning and Management	PEC	3	2	1	0	3	0
2.	HYL-502	Urban Hydrology	PEC	3	2	1	0	3	0
3.	HYL-503	Irrigation and Drainage Engineering	PEC	3	2	1	0	3	0
4.	HYL-504	Geophysical Investigations	PEC	3	2	0	2	3	0
5.	HYL-505	Surface Water Modelling and Simulation	PEC	3	2	0	2	3	0
6.	HYL-506	Soil and Groundwater Contamination Modelling	PEC	3	2	1	0	3	0
7.	HYL-507	Hydrometeorology and Climate Change	PEC	3	2	1	0	3	0
8.	HYL-508	Vadose Zone Hydrology	PEC	3	2	0	2	3	0
9.	HYL-509	Ecohydrology	PEC	3	2	1	0	3	0
10.	HYL-510	Membranes for Desalination and Purification	PEC	3	2	0	2	3	0
11.	HYL-511	Hydrological Data Collection and Processing	PEC	3	2	0	2	3	0
12.	HYL-512	Numerical Methods in Hydrology	PEC	3	2	1	0	3	0
13.	HYL-513	Environmental Planning and Assessment of Projects	PEC	3	2	1	0	3	0
14.	HYL-514	Soil and Water Remediation	PEC	3	2	0	2	3	0
15.	HYL-515	Hydrogeochemistry	PEC	3	2	0	2	3	0
16.	HYL-516	Soft Computing Techniques	PEC	3	2	0	2	3	0
17.	HYL-517	Multi-phase Flow through Porous Media	PEC	3	2	1	0	3	0
18.	HYL-518	Hydro-informatics	PEC	3	2	0	2	3	0
19.	HYL-519	Watershed Modelling and Simulation	PEC	3	2	0	2	3	0
20.	HYL-520	Isotope Hydrology	PEC	3	2	1	0	3	0

M.Tech. (Surface Water Hydrology)/PG Diploma in Surface Water Hydrology

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HYT-501	Data Analysis and Numerical Modelling	STAR	3	2	1	0	3	0

Social Science Course Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HYS-501	Natural Resources, Society and Environment	SSC	2	2	0	0	2	0
2.	HYS-502	Rural Water Supply and Sanitation	SSC	2	2	0	0	2	0

DEPARTMENT OF HYDROLOGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Ground Water Hydrology)/P.G. Diploma in Ground Water Hydrology**
Department: **Department of Hydrology**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	HYC-505	Remote Sensing and GIS Applications	PCC	3	2	0	2	3	0
2.	HYC-511	Groundwater Hydrology	PCC	3	2	0	2	3	0
3.	HYC-513	Environmental Quality	PCC	3	2	0	2	3	0
4.	HYC-515	Hydrologic Elements and Analysis	PCC	3	2	1	0	3	0
5.	HYC-517	Systems Analysis and Applications in Hydrology	PCC	3	2	0	2	3	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**17**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	3	-	-	-	-	-
2.		Program Elective-II	PEC	3	-	-	-	-	-
3.		Program Elective-III	PEC	3	-	-	-	-	-
4.		Program Elective-IV	PEC	3	-	-	-	-	-
5.		Program Elective-V	PEC	3	-	-	-	-	-
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	HYC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**20**					

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DEPARTMENT OF HYDROLOGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Ground Water Hydrology)/P.G. Diploma in Ground Water Hydrology**
Department: **Department of Hydrology**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	HYC-691	Internship Social Activity	ISA	5	-	-	-	-	-
2.	HYC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	HYC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	17	20	15	14
Total Credits	**66**			

M.Tech. (Ground Water Hydrology)/P.G. Diploma in Ground Water Hydrology

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HYL-501	Water Resources Planning and Management	PEC	3	2	1	0	3	0
2.	HYL-502	Urban Hydrology	PEC	3	2	1	0	3	0
3.	HYL-503	Irrigation and Drainage Engineering	PEC	3	2	1	0	3	0
4.	HYL-504	Geophysical Investigations	PEC	3	2	0	2	3	0
5.	HYL-505	Surface Water Modelling and Simulation	PEC	3	2	0	2	3	0
6.	HYL-506	Soil and Groundwater Contamination Modelling	PEC	3	2	1	0	3	0
7.	HYL-507	Hydrometeorology and Climate Change	PEC	3	2	1	0	3	0
8.	HYL-508	Vadose Zone Hydrology	PEC	3	2	0	2	3	0
9.	HYL-509	Ecohydrology	PEC	3	2	1	0	3	0
10.	HYL-510	Membranes for Desalination and Purification	PEC	3	2	0	2	3	0
11.	HYL-511	Hydrological Data Collection and Processing	PEC	3	2	0	2	3	0
12.	HYL-512	Numerical Methods in Hydrology	PEC	3	2	1	0	3	0
13.	HYL-513	Environmental Planning and Assessment of Projects	PEC	3	2	1	0	3	0
14.	HYL-514	Soil and Water Remediation	PEC	3	2	0	2	3	0
15.	HYL-515	Hydrogeochemistry	PEC	3	2	0	2	3	0
16.	HYL-516	Soft Computing Techniques	PEC	3	2	0	2	3	0
17.	HYL-517	Multi-phase Flow through Porous Media	PEC	3	2	1	0	3	0
18.	HYL-518	Hydro-informatics	PEC	3	2	0	2	3	0
19.	HYL-519	Watershed Modelling and Simulation	PEC	3	2	0	2	3	0
20.	HYL-520	Isotope Hydrology	PEC	3	2	1	0	3	0

M.Tech. (Ground Water Hydrology)/P.G. Diploma in Ground Water Hydrology

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HYT-501	Data Analysis and Numerical Modelling	STAR	3	2	1	0	3	0

Social Science Course Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HYS-501	Natural Resources, Society and Environment	SSC	2	2	0	0	2	0
2.	HYS-502	Rural Water Supply and Sanitation	SSC	2	2	0	0	2	0

DEPARTMENT OF HYDROLOGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Watershed Management)/P.G. Diploma in Watershed Management**
Department: **Department of Hydrology**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	HYC-509	Surface Water Quality Modelling	PCC	3	2	0	2	3	0
2.	HYC-511	Groundwater Hydrology	PCC	3	2	0	2	3	0
3.	HYC-515	Hydrologic Elements and Analysis	PCC	3	2	1	0	3	0
4.	HYC-517	Systems Analysis and Applications in Hydrology	PCC	3	2	0	2	3	0
5.	HYC-521	Watershed Behaviour and Conservation Practices	PCC	3	2	1	0	3	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**17**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	3	-	-	-	-	-
2.		Program Elective-II	PEC	3	-	-	-	-	-
3.		Program Elective-III	PEC	3	-	-	-	-	-
4.		Program Elective-IV	PEC	3	-	-	-	-	-
5.		Program Elective-V	PEC	3	-	-	-	-	-
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	HYC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**20**					

DEPARTMENT OF HYDROLOGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Watershed Management)/P.G. Diploma in Watershed Management**
Department: **Department of Hydrology**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	HYC-691	Internship Social Activity	ISA	5	-	-	-	-	-
2.	HYC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	HYC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	17	20	15	14
Total Credits	**66**			

M.Tech. (Watershed Management)/P.G. Diploma in Watershed Management

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HYL-501	Water Resources Planning and Management	PEC	3	2	1	0	3	0
2.	HYL-502	Urban Hydrology	PEC	3	2	1	0	3	0
3.	HYL-503	Irrigation and Drainage Engineering	PEC	3	2	1	0	3	0
4.	HYL-504	Geophysical Investigations	PEC	3	2	0	2	3	0
5.	HYL-505	Surface Water Modelling and Simulation	PEC	3	2	0	2	3	0
6.	HYL-506	Soil and Groundwater Contamination Modelling	PEC	3	2	1	0	3	0
7.	HYL-507	Hydrometeorology and Climate Change	PEC	3	2	1	0	3	0
8.	HYL-508	Vadose Zone Hydrology	PEC	3	2	0	2	3	0
9.	HYL-509	Ecohydrology	PEC	3	2	1	0	3	0
10.	HYL-510	Membranes for Desalination and Purification	PEC	3	2	0	2	3	0
11.	HYL-511	Hydrological Data Collection and Processing	PEC	3	2	0	2	3	0
12.	HYL-512	Numerical Methods in Hydrology	PEC	3	2	1	0	3	0
13.	HYL-513	Environmental Planning and Assessment of Projects	PEC	3	2	1	0	3	0
14.	HYL-514	Soil and Water Remediation	PEC	3	2	0	2	3	0
15.	HYL-515	Hydrogeochemistry	PEC	3	2	0	2	3	0
16.	HYL-516	Soft Computing Techniques	PEC	3	2	0	2	3	0
17.	HYL-517	Multi-phase Flow through Porous Media	PEC	3	2	1	0	3	0
18.	HYL-518	Hydro-informatics	PEC	3	2	0	2	3	0
19.	HYL-519	Watershed Modelling and Simulation	PEC	3	2	0	2	3	0
20.	HYL-520	Isotope Hydrology	PEC	3	2	1	0	3	0

M.Tech. (Watershed Management)/P.G. Diploma in Watershed Management

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HYT-501	Data Analysis and Numerical Modelling	STAR	3	2	1	0	3	0

Social Science Course Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HYS-501	Natural Resources, Society and Environment	SSC	2	2	0	0	2	0
2.	HYS-502	Rural Water Supply and Sanitation	SSC	2	2	0	0	2	0

MEHTA FAMILY SCHOOL OF DATA SCIENCE AND ARTIFICIAL INTELLIGENCE
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Artificial Intelligence)**
Department: **Mehta Family School of Data Science and Artificial Intelligence**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	DAC-501	Machine Learning	PCC	4	3	1	0	3	0
2.	DAC-503	Essential Mathematics for AI	PCC	4	3	1	0	3	0
3.	DAC-505	Advanced Data Structures and Algorithms	PCC	4	3	1	0	3	0
4.	DAC-507	Programming for AI	PCC	3	0	0	6	0	3
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**17**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	DAC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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MEHTA FAMILY SCHOOL OF DATA SCIENCE AND ARTIFICIAL INTELLIGENCE
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Artificial Intelligence)**
Department: **Mehta Family School of Data Science and Artificial Intelligence**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	DAC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	DAC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	DAC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	17	21	13	14
Total Credits	**65**			

M.Tech. (Artificial Intelligence)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	DAL-501	Convex Optimization in Machine Learning	PEC	4	3	1	0	3	0
2.	DAL-502	Deep Learning	PEC	4	3	1	0	3	0
3.	MAL-526	Numerical Optimization	PEC	4	3	1	0	3	0
4.	DAL-503	Introduction to Compressive Sensing	PEC	4	3	1	0	3	0
5.	DAL-504	Neuromorphic Computing with Emerging Memories and Architectures	PEC	4	3	1	0	3	0
6.	DAL-558	Data Stream Mining	PEC	4	3	1	0	3	0
7.	DAL-559	Stochastic Processes and their Applications	PEC	4	3	1	0	3	0
8.	DAL-522	Computer Architecture for AI	PEC	4	3	1	0	3	0
9.	DAL-505	Artificial Intelligence for Decision Making	PEC	4	3	1	0	3	0
10.	DAL-561	AI for Earth Observations	PEC	4	3	1	0	3	0
11.	DAL-506	Applications of AI in Physics	PEC	4	3	1	0	3	0
12.	DAL-565	Computer Vision	PEC	4	3	1	0	3	0
13.	DAL-507	Game Theory	PEC	4	3	1	0	3	0
14.	DAL-567	Introduction to Materials Informatics	PEC	4	3	1	0	3	0
15.	ECL-526	Statistical Machine Learning for Variation- Aware Electronic Device and Circuit Simulation	PEC	4	3	1	0	3	0
16.	EEL-581	Intelligent Control Techniques	PEC	4	3	0	2	3	0
17.	DAL-508	Applications of AI in Biology	PEC	4	3	1	0	3	0
18.	DAL-509	VLSI Architectures for AI in CMOS Technology	PEC	4	3	1	0	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	DAT-501	Applications of AI/ML	STAR	3	3	0	0	3	0

MEHTA FAMILY SCHOOL OF DATA SCIENCE AND ARTIFICIAL INTELLIGENCE
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Data Science)**
Department: **Mehta Family School of Data Science and Artificial Intelligence**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	DAC-501	Machine Learning	PCC	4	3	1	0	3	0
2.	DAC-511	Mathematics for Data Science	PCC	4	3	1	0	3	0
3.	DAC-513	Data Structures and Algorithms	PCC	4	3	1	0	3	0
4.	DAC-515	Programming for Data Science	PCC	3	0	0	6	-	-
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**17**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	DAC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

MEHTA FAMILY SCHOOL OF DATA SCIENCE AND ARTIFICIAL INTELLIGENCE
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Data Science)**
Department: **Mehta Family School of Data Science and Artificial Intelligence**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	DAC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	DAC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	DAC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	17	21	13	14
Total Credits	**65**			

M.Tech. (Data Science)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	DAL-571	Big Data Analytics	PEC	4	3	1	0	3	0
2.	DAL-502	Deep Learning	PEC	4	3	1	0	3	0
3.	DAL-510	Ethics in Data Science	PEC	4	3	1	0	3	0
4.	MAL-552	Evolutionary Algorithms	PEC	4	3	1	0	3	0
5.	DAL-511	Intrusion Detection Systems	PEC	4	3	1	0	3	0
6.	MAL-515	Advanced Operations Research	PEC	4	3	1	0	3	0
7.	DAL-512	Reinforcement Learning	PEC	4	3	1	0	3	0
8.	DAL-513	Spreadsheet Modeling and Simulation	PEC	4	3	1	0	3	0
9.	MAL-551	Soft Computing	PEC	4	3	1	0	3	0
10.	MAL-544	Statistical Inference	PEC	4	3	1	0	3	0
11.	DAL-514	Time Series Data Analysis	PEC	4	3	1	0	3	0
12.	DAL-515	Principles of Database Systems	PEC	4	3	0	2	3	0
13.	DAL-516	Blockchain Technology	PEC	4	3	1	0	3	0
14.	DAL-568	ML and AI Applications in Earth Sciences	PEC	4	3	1	0	3	0
15.	DAL-576	Data Science in Bioinformatics	PEC	4	3	1	0	3	0
16.	DAL-517	Digital Image Processing	PEC	4	3	1	0	3	0
17.	DAL-518	Graphs Algorithms in Data Science	PEC	4	3	1	0	3	0
18.	DAL-579	Leveraging Data Science for Finance	PEC	4	3	1	0	3	0
19.	DAL-523	Multi-Objective and Multi-Criteria Decision Making	PEC	4	3	1	0	3	0

20.	MAL-550	Parallel Computing	PEC	4	3	1	0	3	0
21.	DAL-520	Pattern Recognition	PEC	4	3	1	0	3	0
22.	DAL-521	Recommender Systems	PEC	4	3	0	2	3	0
23.	DAL-583	Data-driven Analytics for Smart Transportation Systems	PEC	4	3	1	0	3	0

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DEPARTMENT OF PAPER TECHNOLOGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Packaging Technology)**
Department: **Department of Paper Technology**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	PPC-521	Packaging Principles, Processes and Sustainability	PCC	2	2	0	0	2	0
2.	PPC-523	Packaging Materials	PCC	3	3	0	2/2	3	0
3.	PPC-525	Converting Processes for Packaging	PCC	3	3	0	0	3	0
4.	PPC-527	Package Performance	PCC	3	0	0	6	0	0
5.	PPC-529	Package Design	PCC	2	2	0	0	2	0
6.	PPC-531	Food and Pharmaceutical Packaging	PCC	3	3	0	0	3	0
7.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	3	-	-	-	-	-
2.		Program Elective-II	PEC	3	-	-	-	-	-
3.		Program Elective-III	PEC	3	-	-	-	-	-
4.		Program Elective-IV	PEC	3	-	-	-	-	-
5.		Program Elective-V	PEC	3	-	-	-	-	-
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	PPC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**20**					

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DEPARTMENT OF PAPER TECHNOLOGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Packaging Technology)**
Department: **Department of Paper Technology**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	PPC-691	Internship Social Activity	ISA	5	-	-	-	-	-
2.	PPC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	PPC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	**18**	**20**	**15**	**14**
Total Credits	**67**			

M.Tech. (Packaging Technology)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	PPL-517	Smart Packaging	PEC	3	3	0	0	3	0
2.	PPL-518	Robotics and Automated Packaging	PEC	3	3	0	0	3	0
3.	PPL-519	Distribution Packaging Dynamics	PEC	3	3	0	0	3	0
4.	PPL-520	Sustainable Packaging and Life Cycle Assessment	PEC	3	3	0	0	3	0
5.	PPL-521	Hazardous Material Packaging	PEC	3	3	0	0	3	0
6.	PPL-522	Industrial Packaging	PEC	3	3	0	0	3	0
7.	PPL-523	Lamination and Functional Coatings	PEC	3	3	0	0	3	0
8.	PPL-524	Nanotechnology Application in Packaging	PEC	3	3	0	0	3	0
9.	PPL-525	Economics in Packaging	PEC	3	3	0	0	3	0
10.	PPL-526	Advanced Packaging Materials Characterization	PEC	3	3	0	2/2	3	0
11.	PPL-527	Business Law	PEC	3	3	0	0	3	0
12.	PPL-528	Logistics and Supply Chain Management	PEC	3	3	0	0	3	0
13.	PPL-529	Industrial Design	PEC	3	3	0	0	3	0
14.	PPL-530	Printing Technology	PEC	3	3	0	0	3	0
15.	PPL-531	Advanced Numerical Methods and Statistics	PEC	3	3	0	0	3	0

M.Tech. (Packaging Technology)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	PPT-501	Pulp, Paper & Packaging	STAR	3	3	0	0	3	0
2.	PPT-502	Environmental Control	STAR	3	3	0	0	3	0

DEPARTMENT OF PAPER TECHNOLOGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Pulp and Paper Engineering)**
Department: **Department of Paper Technology**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	PPC-501	Pulping	PCC	3	3	0	2/2	3	0
2.	PPC-503	Washing and Bleaching	PCC	2	2	0	2/2	2	0
3.	PPC-505	Chemical Recovery Process	PCC	2	2	0	2/2	2	0
4.	PPC-507	Paper Making	PCC	2	2	0	2/2	2	0
5.	PPC-509	Stock Preparation	PCC	2	2	0	0	2	0
6.	PPC-511	Paper Properties	PCC	2	2	0	0	2	0
7.	PPC-513	Stock Preparation and Paper Properties	PCC	3	0	0	6	0	0
8.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	3	-	-	-	-	-
2.		Program Elective-II	PEC	3	-	-	-	-	-
3.		Program Elective-III	PEC	3	-	-	-	-	-
4.		Program Elective-IV	PEC	3	-	-	-	-	-
5.		Program Elective-V	PEC	3	-	-	-	-	-
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	PPC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**20**					

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DEPARTMENT OF PAPER TECHNOLOGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Pulp and Paper Engineering)**
Department: **Department of Paper Technology**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	PPC-691	Internship Social Activity	ISA	5	-	-	-	-	-
2.	PPC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	PPC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	**18**	**20**	**15**	**14**
Total Credits	**67**			

M.Tech. (Pulp and Paper Engineering)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	PPL-501	Process Equipment and Design	PEC	3	3	0	0	3	0
2.	PPL-502	Pulp Mill Calculations	PEC	3	3	0	0	3	0
3.	PPL-503	Paper Mill Calculations	PEC	3	3	0	0	3	0
4.	PPL-504	Chemical Recovery Process Calculations	PEC	3	3	0	0	3	0
5.	PPL-505	Secondary Fiber Processing	PEC	3	3	0	0	3	0
6.	PPL-506	Bio-Process and its Application	PEC	3	3	0	0	3	0
7.	PPL-507	Electro kinetics in Paper Making	PEC	3	3	0	0	3	0
8.	PPL-508	Coated and Specialty Papers	PEC	3	3	0	0	3	0
9.	PPL-509	Risk Analysis and Management in Industry	PEC	3	3	0	0	3	0
10.	PPL-510	System Closure	PEC	3	3	0	0	3	0
11.	PPL-511	Advanced Paper and Packaging Materials Characterization	PEC	3	3	0	0	3	0
12.	PPL-512	Papermaking Chemistry	PEC	3	3	0	0	3	0
13.	PPL-513	Process Integration in Pulp and Paper Industry	PEC	3	3	0	0	3	0
14.	PPL-514	Environmental Management	PEC	3	3	0	0	3	0
15.	PPL-515	Printing Operations	PEC	3	3	0	0	3	0
16.	PPL-516	Packaging Papers and Boards	PEC	3	3	0	0	3	0

M.Tech. (Pulp and Paper Engineering)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	PPT-501	Pulp, Paper & Packaging	STAR	3	3	0	0	3	0
2.	PPT-502	Environmental Control	STAR	3	3	0	0	3	0

DEPARTMENT OF HYDRO AND RENEWABLE ENERGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Renewable and Hydro Energy)**
Department: **Department of Hydro and Renewable Energy**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	HRC-501	Hydro Power Planning and Management	PCC	4	3	1	0	3	0
2.	HRC-503	Renewable Energy Resources Development Technology	PCC	3	3	0	0	3	0
3.	HRC-505	Grid Integration of Renewable Energy	PCC	3	3	0	0	3	0
4.	HRC-507	Renewable and Hydro Energy Lab.	PCC	3	0	0	6	0	3
5.	HRC-509	Finance, Policy and Regulations for Renewable Energy	PCC	3	3	0	0	3	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	HRC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF HYDRO AND RENEWABLE ENERGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Renewable and Hydro Energy)**
Department: **Department of Hydro and Renewable Energy**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	HRC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	HRC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	HRC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

M.Tech. (Renewable and Hydro Energy)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HRL-511	Hydro Electric Equipment	PEC	4	3	1	2/2	3	0
2.	HRL-512	Design of Hydropower Structures	PEC	4	3	1	0	3	0
3.	HRL-513	Hydro mechanical Equipment	PEC	4	3	1	2/2	3	0
4.	HRL-514	Modelling, Simulation and Computer Applications	PEC	4	3	1	2/2	3	0
5.	HRL-503	Environmental Planning and Management	PEC	4	3	1	0	3	0
6.	HRL-515	Wind Energy Application Technology	PEC	4	3	1	0	3	0
7.	HRL-516	Instrumentation for Hydro Power Plants	PEC	4	3	1	2/2	3	0
8.	HRL-517	Rural Electrical Energy System Planning and Design	PEC	4	3	1	0	3	0
9.	HRL-518	Remote Sensing and GIS for Renewable Energy Planning	PEC	4	3	0	2	3	0
10.	HRL-519	Construction Planning and Management	PEC	4	3	1	0	3	0
11.	HRL-520	Biomass, Bioenergy and Biofuels	PEC	4	3	1	0	3	0
12.	HRL-521	Solar Photo-Voltaic Design and Application	PEC	4	3	1	0	3	0
13.	HRL-522	Energy Conservation and Management	PEC	4	3	1	0	3	0
14.	HRL-523	Climate Change and Water Resources	PEC	4	3	1	0	3	0
15.	HRL-502	Energy-water-food Nexus	PEC	4	3	1	0	3	0
16.	HRL-524	Electric Vehicular Technology	PEC	4	3	1	0	3	0
17.	HRL-525	Energy Storage Systems	PEC	4	3	1	0	3	0
18.	HRL-526	Hydrogen Technology and Economy	PEC	4	3	1	2/2	3	0
19.	HRL-527	Advanced Modelling for Renewable Energy Power Systems	PEC	4	3	1	2/2	3	0

M.Tech. (Renewable and Hydro Energy)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HRT-501	Modeling of turbulence in Turbines	STAR	3	3	0	0	3	0
2.	HRT-502	System Dynamics Modelling	STAR	3	3	0	0	3	0
3.	HRT-503	Modeling and stability analysis of DC-DC converters	STAR	3	3	0	0	3	0
4.	HRT-504	Quantitative Investigations of Flows	STAR	3	3	0	0	3	0

Social Science Course Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HRS-501	Environmental and Social Sustainability	SSC	2	3	0	0	3	0
2.	HRS-502	Energy Economics	SSC	2	3	0	0	3	0

DEPARTMENT OF HYDRO AND RENEWABLE ENERGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Environment Management of Rivers and Lakes)**
Department: **Department of Hydro and Renewable Energy**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	HRC-511	Integrated Management of Water Bodies	PCC	4	3	1	2/2	3	0
2.	HRC-513	Project Formulation & Implementation	PCC	3	3	0	0	3	0
3.	HRC-515	Waste Water Collection, Treatment and Disposal	PCC	3	3	0	0	3	0
4.	HRC-517	Laboratory Course	PCC	2	0	0	3	0	3
5.	HRC-519	Aquatic Ecology	PCC	4	3	1	2/2	3	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	3/4	-	-	-	-	-
4.		Program Elective-IV	PEC	3/4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	HRC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**19/21**					

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DEPARTMENT OF HYDRO AND RENEWABLE ENERGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Environment Management of Rivers and Lakes)**
Department: **Department of Hydro and Renewable Energy**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	HRC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	HRC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	HRC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	19/21	13	14
Total Credits	**64/66**			

M.Tech. (Environment Management of Rivers and Lakes)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HRL-503	Environmental Planning and Management	PEC	4	3	1	0	3	0
2.	HRL-522	Energy Conservation and Management	PEC	4	3	1	0	3	0
3.	HRL-523	Climate Change and Water Resources	PEC	4	3	1	0	3	0
4.	HRL-528	Hydrology and Modeling of Water Bodies	PEC	4	3	1	0	3	0
5.	HRL-529	Environmental Laws, Public Participation and Institutional Development	PEC	4	3	1	0	3	0
6.	HRL-530	Coastal Pollution Monitoring and Impact Assessment	PEC	4	3	1	0	3	0
7.	HRL-531	Planning and Management of Environmental Facility	PEC	4	3	1	0	3	0
8.	HRL-532	Application of RS & GIS in Environment Management	PEC	4	3	1	0	3	0
9.	HRL-533	Environmental Modelling, Simulation and Computer Applications	PEC	4	3	1	2/2	3	0
10.	HRL-534	Biodiversity Conservation	PEC	3	3	0	0	3	0
11.	CEL-603	Industrial and Hazardous Waste Management	PEC	4	3	1	0	3	0
12.	CEL-604	Environment Impact and Risk Assessment	PEC	4	3	1	0	3	0
13.	CEL-605	Solid Waste Management	PEC	4	3	1	0	3	0
14.	HYC-511	Groundwater Hydrology	PEC	3	3	0	0	3	0
15.	HYC-521	Watershed Behavior and Conservation Practices	PEC	3	3	0	0	3	0
16.	HYL-502	Urban Hydrology	PEC	3	3	0	0	3	0

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Communication Systems)**
Department: **Department of Electronics and Communication Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-505	Linear Algebra and Random Processes	PCC	4	3	1	0	3	0
2.	ECC-511	Digital Signal Processing and Communication Techniques	PCC	4	3	0	2	3	0
3.	ECC-513	Principles of Wireless Communication	PCC	4	3	1	0	3	0
4.	ECC-515	Information and Coding Theory	PCC	4	3	1	0	3	0
5.		Program Elective-I	PEC	2	0	0	3	0	3
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**20**					
Semester-II (Spring)									
1.		Program Elective-II	PEC	4	-	-	-	-	-
2.		Program Elective-III	PEC	4	-	-	-	-	-
3.		Program Elective-IV	PEC	4	-	-	-	-	-
4.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
5.	ECC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**17**					

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Communication Systems)**
Department: **Department of Electronics and Communication Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-691	Internship Social Activity	ISA	3-5	-	-	-	-	-
2.	ECC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13-15**					
Semester-II (Spring)									
1.	ECC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	20	17	13-15	14
Total Credits	**64-66**			

M.Tech. (Communication Systems)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ECL-554	Communication Laboratory	PEC	2	0	0	3	0	3
2.	ECL-555	Signal Processing Laboratory	PEC	2	0	0	3	0	3
3.	ECL-514	Detection and Estimation Theory	PEC	4	3	1	0	3	0
4.	ECL-614	Adaptive Signal Processing Techniques	PEC	4	3	1	0	3	0
5.	ECL-556	5G Standards and 6G Wireless Technologies	PEC	4	3	1	0	3	0
6.	ECL-557	Principles of Sparse Recovery and Compressed Sensing	PEC	4	3	1	0	3	0
7.	ECL-558	Wireless Communication: Advanced Concepts and Applications	PEC	4	3	1	0	3	0
8.	ECL-562	Optical Wireless Communication	PEC	4	3	1	0	3	0
9.	ECL-563	Machine Learning and Signal Processing for Neuroinformatics	PEC	4	3	1	0	3	0

M.Tech. (Communication Systems)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ECT-501	Inference and Learning Algorithms	STAR	3	3	0	0	3	0
2.	ECT-502	Semiconductor Technology and its Applications	STAR	3					
3.	ECT-503	5G/6G Technology and its Societal Applications	STAR	3					
4.	ECT-504	Applications of RF Technology in Defence and Space Applications	STAR	3					

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Communication Systems**
Department: **Department of Electronics and Communication Engineering**
Year: **I**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-505	Linear Algebra and Random Processes	PCC	4	3	1	0	3	0
2.	ECC-511	Digital Signal Processing and Communication Techniques	PCC	4	3	0	2	3	0
3.	ECC-513	Principles of Wireless Communication	PCC	4	3	1	0	3	0
4.	ECC-515	Information and Coding Theory	PCC	4	3	1	0	3	0
5.		Program Elective-I	PEC	2	0	0	3	0	3
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**20**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.	ECC-751A	Thesis Stage-I	THESIS	13	-	-	-	-	-
		Total		**17**					

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Communication Systems**
Department: **Department of Electronics and Communication Engineering**
Year: **II**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-751B	Thesis Stage-II	THESIS	15	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	ECC-751C	Thesis Stage-III	THESIS	16	-	-	-	-	-
		Total		**16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	20	17	15	16
Total Credits	**68**			

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Master of Science (by Research) in Communication Systems

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ECL-554	Communication Laboratory	PEC	2	0	0	3	0	3
2.	ECL-555	Signal Processing Laboratory	PEC	2	0	0	3	0	3
3.	ECL-514	Detection and Estimation Theory	PEC	4	3	1	0	3	0
4.	ECL-614	Adaptive Signal Processing Techniques	PEC	4	3	1	0	3	0
5.	ECL-556	5G Standards and 6G Wireless Technologies	PEC	4	3	1	0	3	0
6.	ECL-557	Principles of Sparse Recovery and Compressed Sensing	PEC	4	3	1	0	3	0
7.	ECL-558	Wireless Communication: Advanced Concepts and Applications	PEC	4	3	1	0	3	0
8.	ECL-562	Optical Wireless Communication	PEC	4	3	1	0	3	0
9.	ECL-563	Machine Learning and Signal Processing for Neuroinformatics	PEC	4	3	1	0	3	0

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Microelectronics and VLSI)**
Department: **Department of Electronics and Communication Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-531	Digital VLSI Circuit Design	PCC	4	3	0	2	3	0
2.	ECC-533	VLSI Technology	PCC	4	3	0	2	3	0
3.	ECC-535	Foundations of Semiconductor Device Physics	PCC	4	3	0	2	3	0
4.	ECC-537	Analog VLSI Circuit Design	PCC	4	3	1	0	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	ECC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Microelectronics and VLSI)**
Department: **Department of Electronics and Communication Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-691	Internship Social Activity	ISA	3-5	-	-	-	-	-
2.	ECC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13-15**					
Semester-II (Spring)									
1.	ECC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13-15	14
Total Credits	**66-68**			

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M.Tech. (Microelectronics and VLSI)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ECL-532	Power Electronic Devices, Circuits and Systems	PEC	4	3	1	0	3	0
2.	ECL-525	Hardware Architecture for Deep-Learning	PEC	4	3	1	0	3	0
3.	ECL-526	Statistical Machine Learning for Variation-Aware Electronic Device and Circuit Simulation	PEC	4	3	1	0	3	0
4.	ECL-561	Compact Modeling of Semiconductor Devices	PEC	4	3	1	0	3	0
5.	ECL-533	Semiconductor Device Modeling	PEC	4	3	1	0	3	0
6.	ECL-534	MOS Device Physics	PEC	4	3	1	0	3	0
7.	ECL-535	Digital System Design	PEC	4	3	1	0	3	0
8.	ECL-536	Semiconductor Microwave Devices & Applications	PEC	4	3	1	0	3	0
9.	ECL-537	Optoelectronic Materials & Devices	PEC	4	3	1	0	3	0
10.	ECL-538	Mixed Signal Circuit Design	PEC	4	3	1	0	3	0
11.	ECL-539	VLSI System Design	PEC	4	3	1	0	3	0
12.	ECL-540	Device & Circuit Interaction	PEC	4	3	1	0	3	0
13.	ECL-587	Nanoscale Devices	PEC	4	3	1	0	3	0
14.	ECL-541	Performance and Reliability of VLSI Circuits	PEC	4	3	1	0	3	0
15.	ECL-543	Advanced VLSI Interconnects	PEC	4	3	1	0	3	0
16.	ECL-545	Organic Electronics	PEC	4	3	1	0	3	0
17.	ECL-591	VLSI Physical Design	PEC	4	3	1	0	3	0

18.	ECL-546	Compound Semiconductors and RF Devices	PEC	4	3	1	0	3	0
19.	ECL-547	CAD for VLSI	PEC	4	3	1	0	3	0
20.	ECL-548	VLSI Digital Signal Processing	PEC	4	3	1	0	3	0
21.	ECL-549	VLSI Testing and Testability	PEC	4	3	1	0	3	0
22.	ECL-551	MEMS and NEMS	PEC	4	3	1	0	3	0
23.	ECL-552	Low Voltage CMOS Circuit Operation	PEC	4	3	1	0	3	0
24.	ECL-635	Magnetic Random Access Memory	PEC	4	3	1	0	3	0
25.	ECL-553	Advanced Analog IC Design	PEC	4	3	1	0	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**	**Theory**	**Practical**
1.	ECT-501	Inference and Learning Algorithms	STAR	3	3	0	0	3	0
2.	ECT-502	Semiconductor Technology and its Applications	STAR	3					
3.	ECT-503	5G/6G Technology and its Societal Applications	STAR	3					
4.	ECT-504	Applications of RF Technology in Defence and Space Applications	STAR	3					

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Microelectronics and VLSI**
Department: **Department of Electronics and Communication Engineering**
Year: **I**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-531	Digital VLSI Circuit Design	PCC	4	3	0	2	3	0
2.	ECC-533	VLSI Technology	PCC	4	3	0	2	3	0
3.	ECC-535	Foundations of Semiconductor Device Physics	PCC	4	3	0	2	3	0
4.	ECC-537	Analog VLSI Circuit Design	PCC	4	3	1	0	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.	ECC-751A	Thesis Stage-I	THESIS	13	-	-	-	-	-
		Total		**17**					

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Microelectronics and VLSI**
Department: **Department of Electronics and Communication Engineering**
Year: **II**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-751B	Thesis Stage-II	THESIS	15	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	ECC-751C	Thesis Stage-III	THESIS	16	-	-	-	-	-
		Total		**16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	17	15	16
Total Credits	**66**			

Master of Science (by Research) in Microelectronics and VLSI

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ECL-532	Power Electronic Devices, Circuits and Systems	PEC	4	3	1	0	3	0
2.	ECL-525	Hardware Architecture for Deep-Learning	PEC	4	3	1	0	3	0
3.	ECL-526	Statistical Machine Learning for Variation-Aware Electronic Device and Circuit Simulation	PEC	4	3	1	0	3	0
4.	ECL-561	Compact Modeling of Semiconductor Devices	PEC	4	3	1	0	3	0
5.	ECL-533	Semiconductor Device Modeling	PEC	4	3	1	0	3	0
6.	ECL-534	MOS Device Physics	PEC	4	3	1	0	3	0
7.	ECL-535	Digital System Design	PEC	4	3	1	0	3	0
8.	ECL-536	Semiconductor Microwave Devices & Applications	PEC	4	3	1	0	3	0
9.	ECL-537	Optoelectronic Materials & Devices	PEC	4	3	1	0	3	0
10.	ECL-538	Mixed Signal Circuit Design	PEC	4	3	1	0	3	0
11.	ECL-539	VLSI System Design	PEC	4	3	1	0	3	0
12.	ECL-540	Device & Circuit Interaction	PEC	4	3	1	0	3	0
13.	ECL-587	Nanoscale Devices	PEC	4	3	1	0	3	0
14.	ECL-541	Performance and Reliability of VLSI Circuits	PEC	4	3	1	0	3	0
15.	ECL-543	Advanced VLSI Interconnects	PEC	4	3	1	0	3	0
16.	ECL-545	Organic Electronics	PEC	4	3	1	0	3	0
17.	ECL-591	VLSI Physical Design	PEC	4	3	1	0	3	0

18.	ECL-546	Compound Semiconductors and RF Devices	PEC	4	3	1	0	3	0
19.	ECL-547	CAD for VLSI	PEC	4	3	1	0	3	0
20.	ECL-548	VLSI Digital Signal Processing	PEC	4	3	1	0	3	0
21.	ECL-549	VLSI Testing and Testability	PEC	4	3	1	0	3	0
22.	ECL-551	MEMS and NEMS	PEC	4	3	1	0	3	0
23.	ECL-552	Low Voltage CMOS Circuit Operation	PEC	4	3	1	0	3	0
24.	ECL-635	Magnetic Random Access Memory	PEC	4	3	1	0	3	0
25.	ECL-553	Advanced Analog IC Design	PEC	4	3	1	0	3	0

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

ProgramCode: **XXX M.Tech. (RF and Microwave Engineering)**
Department: **Department of Electronics and Communication Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-521	Antenna Theory and Design	PCC	4	3	1	0	3	0
2.	ECC-523	Advanced EMFT	PCC	3	3	0	0	3	0
3.	ECC-525	Microwave Engineering	PCC	3	3	0	0	3	0
4.	ECC-527	Introduction to Microwave Measurements	PCC	4	2	0	4	3	2
5.	ECC-529	Microwave Engineering Lab.	PCC	2	0	0	3	0	3
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	2	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	ECC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**19**					

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (RF and Microwave Engineering)**
Department: **Department of Electronics and Communication Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-691	Internship Social Activity	ISA	3-5	-	-	-	-	-
2.	ECC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13-15**					
Semester-II (Spring)									
1.	ECC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	19	13-15	14
Total Credits	**64-66**			

M.Tech. (RF and Microwave Engineering)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ECL-542	Microwave Integrated Circuits	PEC	4	3	1	0	3	0
2.	ECL-512	High Power mm/THz Wave Engineering	PEC	4	3	1	0	3	0
3.	ECL-544	Advanced Radar Engineering	PEC	4	3	1	0	3	0
4.	ECL-513	Fiber Optic Systems	PEC	4	3	1	0	3	0
5.	ECL-559	Advanced Maths	PEC	4	3	1	0	3	0
6.	ECL-516	Microwave and mm-wave Circuits	PEC	4	3	1	0	3	0
7.	ECL-517	Microwave Imaging	PEC	4	3	1	0	3	0
8.	ECL-518	Digital Communication Systems	PEC	4	3	1	0	3	0
9.	ECL-510	Nonionizing Radiations and Health Risks	PEC	4	3	1	0	3	0
10.	ECL-511	Microwave Photonic ICs	PEC	4	3	1	0	3	0
11.	ECL-521	RF Integrated Circuit Design for mmWave Radio	PEC	4	3	1	0	3	0
12.	ECL-522	Computational Techniques for Microwaves	PEC	4	3	1	0	3	0
13.	ECL-523	RF Power Amplifier and Transmitter Design	PEC	4	3	1	0	3	0
14.	ECL-524	RF & Microwave MEMS	PEC	4	3	1	0	3	0
15.	ECL-527	RF CMOS Transceiver Design	PEC	4	3	1	0	3	0
16.	ECL-550	Radar Signal Processing	PEC	4	3	1	0	3	0
17.	ECL-528	Adaptive Beam Forming and Smart Antennas	PEC	4	3	1	0	3	0

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19.	ECL-529	Soft Computing Techniques for RF Engineering	PEC	4	3	1	0	3	0
20.	ECL-530	Advanced Digital Communication Techniques	PEC	4	3	1	0	3	0
21.	ECL-531	Advanced Millimeter-Wave Characterization and Techniques	PEC	4	3	1	0	3	0
22.	ECL-560	Industry Oriented RFM Lab.	PEC	2	0	0	3	0	3
23.	ECL-567	Wireless Communication Lab.	PEC	2	0	0	3	0	3
24.	ECL-565	THz CAD Lab.	PEC	2	0	0	3	0	3

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**	**Theory**	**Practical**
1.	ECT-501	Inference and Learning Algorithms	STAR	3	3	0	0	3	0
2.	ECT-502	Semiconductor Technology and its Applications	STAR	3					
3.	ECT-503	5G/6G Technology and its Societal Applications	STAR	3					
4.	ECT-504	Applications of RF Technology in Defence and Space Applications	STAR	3					

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in RF and Microwave Engineering**
Department: **Department of Electronics and Communication Engineering**
Year: **I**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-521	Antenna Theory and Design	PCC	4	3	1	0	3	0
2.	ECC-523	Advanced EMFT	PCC	3	3	0	0	3	0
3.	ECC-525	Microwave Engineering	PCC	3	3	0	0	3	0
4.	ECC-527	Introduction to Microwave Measurements	PCC	4	2	0	4	3	2
5.	ECC-529	Microwave Engineering Lab.	PCC	2	0	0	3	0	3
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.	ECC-751A	Thesis Stage-I	THESIS	13	-	-	-	-	-
		Total		**17**					

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in RF and Microwave Engineering**
Department: **Department of Electronics and Communication Engineering**
Year: **II**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-751B	Thesis Stage-II	THESIS	15	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	ECC-751C	Thesis Stage-III	THESIS	16	-	-	-	-	-
		Total		**16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	17	15	16
Total Credits	**66**			

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Master of Science (by Research) in RF and Microwave Engineering

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ECL-542	Microwave Integrated Circuits	PEC	4	3	1	0	3	0
2.	ECL-512	High Power mm/THz Wave Engineering	PEC	4	3	1	0	3	0
3.	ECL-544	Advanced Radar Engineering	PEC	4	3	1	0	3	0
4.	ECL-513	Fiber Optic Systems	PEC	4	3	1	0	3	0
5.	ECL-559	Advanced Maths	PEC	4	3	1	0	3	0
6.	ECL-516	Microwave and mm-wave Circuits	PEC	4	3	1	0	3	0
7.	ECL-517	Microwave Imaging	PEC	4	3	1	0	3	0
8.	ECL-518	Digital Communication Systems	PEC	4	3	1	0	3	0
9.	ECL-510	Nonionizing Radiations and Health Risks	PEC	4	3	1	0	3	0
10.	ECL-511	Microwave Photonic ICs	PEC	4	3	1	0	3	0
11.	ECL-521	RF Integrated Circuit Design for mmWave Radio	PEC	4	3	1	0	3	0
12.	ECL-522	Computational Techniques for Microwaves	PEC	4	3	1	0	3	0
13.	ECL-523	RF Power Amplifier and Transmitter Design	PEC	4	3	1	0	3	0
14.	ECL-524	RF & Microwave MEMS	PEC	4	3	1	0	3	0
15.	ECL-527	RF CMOS Transceiver Design	PEC	4	3	1	0	3	0
16.	ECL-550	Radar Signal Processing	PEC	4	3	1	0	3	0
17.	ECL-528	Adaptive Beam Forming and Smart Antennas	PEC	4	3	1	0	3	0

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19.	ECL-529	Soft Computing Techniques for RF Engineering	PEC	4	3	1	0	3	0
20.	ECL-530	Advanced Digital Communication Techniques	PEC	4	3	1	0	3	0
21.	ECL-531	Advanced Millimeter-Wave Characterization and Techniques	PEC	4	3	1	0	3	0
22.	ECL-560	Industry Oriented RFM Lab.	PEC	2	0	0	3	0	3
23.	ECL-567	Wireless Communication Lab.	PEC	2	0	0	3	0	3
24.	ECL-565	THz CAD Lab.	PEC	2	0	0	3	0	3

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

ProgramCode: **XXX M.Tech. (Terahertz Communication and Sensing)**
Department: **Department of Electronics and Communication Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-501	Electromagnetic Field Theory and Scattering	PCC	3	3	0	0	3	0
2.	ECC-503	THz Electronics	PCC	3	3	0	0	3	0
3.	ECC-505	Linear Algebra and Random Processes	PCC	4	3	1	0	3	0
4.	ECC-507	Essential Concepts in THz Communication	PCC	4	3	1	0	3	0
5.	ECC-509	THz Design Lab.	PCC	2	0	0	3	0	3
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	2	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	ECC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**19**					

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Terahertz Communication and Sensing)**
Department: **Department of Electronics and Communication Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-691	Internship Social Activity	ISA	3-5	-	-	-	-	-
2.	ECC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13-15**					
Semester-II (Spring)									
1.	ECC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	19	13-15	14
Total Credits	**64-66**			

M.Tech. (Terahertz Communication and Sensing)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ECL-503	Terahertz Communication Systems	PEC	4	3	1	0	3	0
2.	ECL-504	Millimeter Wave and Terahertz Antenna Design	PEC	4	3	1	0	3	0
3.	ECL-514	Detection and Estimation Theory	PEC	4	3	1	0	3	0
4.	ECL-505	High Speed Semiconductor Devices	PEC	4	3	1	0	3	0
5.	ECL-506	Surface Electromagnetics	PEC	4	3	1	0	3	0
6.	ECL-507	High-Frequency Dielectric Guides	PEC	4	3	1	0	3	0
7.	ECL-508	Terahertz Sensing and Imaging	PEC	4	3	1	0	3	0
8.	ECL-509	Microwave and Millimeter Wave Circuits	PEC	4	3	1	0	3	0
9.	ECL-510	Nonionizing Radiations and Health Risks	PEC	4	3	1	0	3	0
10.	ECL-511	Microwave Photonic ICs	PEC	4	3	1	0	3	0
11.	ECL-618	Wireless Technologies: 5G and Beyond	PEC	4	3	1	0	3	0
12.	ECL-620	Advanced Wireless Communication	PEC	4	3	1	0	3	0
13.	ECL-564	Industry Oriented THz Lab.	PEC	2	0	0	3	0	3
14.	ECL-565	THz-CAD Lab.	PEC	2	0	0	3	0	3
15.	ECL-566	6G Communication Lab.	PEC	2	0	0	3	0	3

M.Tech. (Terahertz Communication and Sensing)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ECT-501	Inference and Learning Algorithms	STAR	3	3	0	0	3	0
2.	ECT-502	Semiconductor Technology and its Applications	STAR	3					
3.	ECT-503	5G/6G Technology and its Societal Applications	STAR	3					
4.	ECT-504	Applications of RF Technology in Defence and Space Applications	STAR	3					

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Terahertz Communication and Sensing**
Department: **Department of Electronics and Communication Engineering**
Year: **I**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-501	Electromagnetic Field Theory and Scattering	PCC	3	3	0	0	3	0
2.	ECC-503	THz Electronics	PCC	3	3	0	0	3	0
3.	ECC-505	Linear Algebra and Random Processes	PCC	4	3	1	0	3	0
4.	ECC-507	Essential Concepts in THz Communication	PCC	4	3	1	0	3	0
5.	ECC-509	THz Design Lab.	PCC	2	0	0	3	0	3
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.	ECC-751A	Thesis Stage-I	THESIS	13	-	-	-	-	-
		Total		**17**					

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Science (by Research) in Terahertz Communication and Sensing**
Department: **Department of Electronics and Communication Engineering**
Year: **II**
Model: **3**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ECC-751B	Thesis Stage-II	THESIS	15	-	-	-	-	-
		Total		**15**					
Semester-II (Spring)									
1.	ECC-751C	Thesis Stage-III	THESIS	16	-	-	-	-	-
		Total		**16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	17	15	16
Total Credits	**66**			

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Master of Science (by Research) in Terahertz Communication and Sensing

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ECL-503	Terahertz Communication Systems	PEC	4	3	1	0	3	0
2.	ECL-504	Millimeter Wave and Terahertz Antenna Design	PEC	4	3	1	0	3	0
3.	ECL-514	Detection and Estimation Theory	PEC	4	3	1	0	3	0
4.	ECL-505	High Speed Semiconductor Devices	PEC	4	3	1	0	3	0
5.	ECL-506	Surface Electromagnetics	PEC	4	3	1	0	3	0
6.	ECL-507	High-Frequency Dielectric Guides	PEC	4	3	1	0	3	0
7.	ECL-508	Terahertz Sensing and Imaging	PEC	4	3	1	0	3	0
8.	ECL-509	Microwave and Millimeter Wave Circuits	PEC	4	3	1	0	3	0
9.	ECL-510	Nonionizing Radiations and Health Risks	PEC	4	3	1	0	3	0
10.	ECL-511	Microwave Photonic ICs	PEC	4	3	1	0	3	0
11.	ECL-618	Wireless Technologies: 5G and Beyond	PEC	4	3	1	0	3	0
12.	ECL-620	Advanced Wireless Communication	PEC	4	3	1	0	3	0
13.	ECL-564	Industry Oriented THz Lab.	PEC	2	0	0	3	0	3
14.	ECL-565	THz CAD Lab.	PEC	2	0	0	3	0	3
15.	ECL-566	6G Communication Lab.	PEC	2	0	0	3	0	3

DEPARTMENT OF MATHEMATICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Sc. (Mathematics)**
Department: **Department of Mathematics**
Year: **I**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MAC-401	Abstract Algebra	PCC	4	3	1	0	3	0
2.	MAC-403	Linear Algebra	PCC	4	3	1	0	3	0
3.	MAC-405	Real Analysis	PCC	4	3	1	0	3	0
4.	MAC-501	Probability and Statistics	PCC	4	3	0	2	3	0
5.	MAC-503	Ordinary Differential Equations	PCC	4	3	1	0	3	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**22**					
Semester-II (Spring)									
1.	MAC-402	Topology	PPI	4	3	1	0	3	0
2.	MAC-404	Functional Analysis	PPI	4	3	1	0	3	0
3.	MAC-502	Complex Analysis	PPI	4	3	1	0	3	0
4.	MAC-504	Partial Differential Equations	PPI	4	3	1	0	3	0
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	MAC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

DEPARTMENT OF MATHEMATICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Sc. (Mathematics)**
Department: **Department of Mathematics**
Year: **II**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	MAC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	MAC-511	Numerical Analysis	PPI	4	3	0	2	3	0
3.	MAC-513	Operations Research	PPI	4	3	0	2	3	0
4.		Program Elective-I	PPI	3/4	-	-	-	-	-
5.		Program Elective-II	PPI	3/4	-	-	-	-	-
		Total		**17/19**					
Semester-II (Spring)									
1.	MAC-601	Project	PROJECT	8	-	-	-	-	-
2.		Program Elective-III	PEC	3/4	-	-	-	-	-
3.		Program Elective-IV	PEC	3/4	-	-	-	-	-
		Total		**14/16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	22	21	17/19	14/16
Total Credits	**74/78**			

M.Sc. (Mathematics)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MAL-410	Computer Programming	PEC	4	3	1	0	3	0
2.	MAL-411	Analytic Number Theory	PEC	4	3	1	0	3	0
3.	MAL-412	Combinatorial Mathematics	PEC	4	3	1	0	3	0
4.	MAL-413	Credit Risk Modeling	PEC	4	3	1	0	3	0
5.	MAL-414	Differential Geometry	PEC	4	3	1	0	3	0
6.	MAL-416	Graph Theory	PEC	4	3	1	0	3	0
7.	MAL-417	Mathematical Image Processing	PEC	4	3	1	0	3	0
8.	MAL-418	Mathematical Modeling and Simulation	PEC	4	3	1	0	3	0
9.	MAL-419	Number Theory	PEC	4	3	1	0	3	0
10.	MAL-420	Statistical Machine Learning	PEC	4	3	1	0	3	0
11.	MAL-511	Abstract Harmonic Analysis	PEC	4	3	1	0	3	0
12.	MAL-512	Advanced Complex Analysis	PEC	4	3	1	0	3	0
13.	MAL-513	Advanced Matrix Theory	PEC	4	3	1	0	3	0
14.	MAL-514	Advanced Numerical Analysis	PEC	4	3	1	0	3	0
15.	MAL-515	Advanced Operations Research	PEC	4	3	1	0	3	0
16.	MAL-516	Advanced Partial Differential Equations	PEC	4	3	1	0	3	0
17.	MAL-517	Algebraic Number Theory	PEC	4	3	1	0	3	0

18.	MAL-518	Algebraic Topology	PEC	4	3	1	0	3	0
19.	MAL-519	Approximation Theory	PEC	4	3	1	0	3	0
20.	MAL-520	Coding Theory	PEC	4	3	1	0	3	0
21.	MAL-521	Commutative Algebra	PEC	4	3	1	0	3	0
22.	MAL-522	Computational Fluid Dynamics	PEC	4	3	1	0	3	0
23.	MAL-523	Control Theory	PEC	4	3	1	0	3	0
24.	MAL-524	Dynamical Systems	PEC	4	3	1	0	3	0
25.	MAL-525	Fluid Dynamics	PEC	4	3	1	0	3	0
26.	MAL-526	Fourier Analysis and Applications	PEC	4	3	1	0	3	0
27.	MAL-527	Fuzzy Sets and Fuzzy Systems	PEC	4	3	1	0	3	0
28.	MAL-528	Hyperbolic Conservation Laws	PEC	4	3	1	0	3	0
29.	MAL-529	Integral Equations and Calculus of Variations	PEC	4	3	1	0	3	0
30.	MAL-530	Finite Element Methods	PEC	4	3	1	0	3	0
31.	MAL-531	Mathematical Biology	PEC	4	3	1	0	3	0
32.	MAL-532	Mathematical Cryptography	PEC	4	3	1	0	3	0
33.	MAL-533	Measure Theory	PEC	4	3	1	0	3	0
34.	MAL-534	Multivariate Techniques	PEC	4	3	1	0	3	0
35.	MAL-535	Numerical Linear Algebra	PEC	4	3	1	0	3	0
36.	MAL-536	Operator Theory	PEC	4	3	1	0	3	0
37.	MAL-537	Optimal Control Theory	PEC	4	3	1	0	3	0
38.	MAL-538	Orthogonal Polynomials and Special Functions	PEC	4	3	1	0	3	0
39.	MAL-539	Portfolio Optimization	PEC	4	3	1	0	3	0
40.	MAL-540	Regularization Theory for Inverse Problems	PEC	4	3	1	0	3	0
41.	MAL-541	Representation Theory of Finite Groups	PEC	4	3	1	0	3	0
42.	MAL-542	Semigroup Theory and Applications	PEC	4	3	1	0	3	0
43.	MAL-543	Sobolev Spaces and Applications	PEC	4	3	1	0	3	0

44.	MAL-544	Statistical Inference	PEC	4	3	1	0	3	0
45.	MAL-545	Stochastic Differential Equations	PEC	4	3	1	0	3	0
46.	MAL-546	Stochastic Partial Differential Equations	PEC	4	3	1	0	3	0
47.	MAL-547	Stochastic Calculus	PEC	4	3	1	0	3	0
48.	MAL-548	Ergodic Theory	PEC	4	3	1	0	3	0
49.	MAL-549	Financial Mathematics	PEC	4	3	1	0	3	0
50.	MAL-550	Financial Risk Management	PEC	4	3	1	0	3	0
51.	MAL-551	Numerical Optimization	PEC	4	3	1	0	3	0
52.	MAL-552	Probability Theory	PEC	3	3	0	0	3	0
53.	MAL-553	Ergodic Theory	PEC	3	3	0	0	3	0
54.	MAL-554	Introduction to Operator Algebra	PEC	3	3	0	0	3	0
55.	MAL-555	Parallel Computing	PEC	4	3	1	0	3	0
56.	MAL-556	Soft Computing	PEC	4	3	1	0	3	0
57.	MAL-557	Evolutionary Algorithms	PEC	4	3	1	0	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	MAT-501	Computational Methods for AI and ML	STAR	3	2	1	0	3	0

DEPARTMENT OF PHYSICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Solid State Electronic Technology)**
Department: **Department of Physics**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	PHC-501	Numerical Analysis and Computational Techniques	PCC	3	2	0	2	3	0
2.	PHC-503	Fabrication and Characterization Techniques	PCC	3	3	0	0	3	0
3.	PHC-505	Laboratory Work in Solid-State Electronic Materials	PCC	3	0	0	6	0	6
4.	PHC-507	Semiconductor Device Physics	PCC	4	3	1	0	3	0
5.	PHC-509	Science and Technology of Thin Films	PCC	3	3	0	0	3	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	PHC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

DEPARTMENT OF PHYSICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Solid State Electronic Technology)**
Department: **Department of Physics**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	PHC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	PHC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	PHC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

M.Tech. (Solid State Electronic Technology)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	PHL-541	Materials for Renewable Energy and Storage	PEC	4	3	1	0	3	0
2.	PHL-542	Analog Integrated Circuit Design	PEC	4	3	1	0	3	0
3.	PHL-543	Digital Signal Processing	PEC	4	3	1	0	3	0
4.	PHL-544	Thin Film Technology	PEC	4	3	1	0	3	0
5.	PHL-545	Nanoscience and Nanotechnology	PEC	4	3	1	0	3	0
6.	PHL-546	Functional Properties of Materials & Devices	PEC	4	3	1	0	3	0
7.	PHL-547	Engineered Materials for Device Application	PEC	4	3	1	0	3	0
8.	PHL-548	Semiconductor Micro-electronic Technology	PEC	4	3	1	0	3	0
9.	PHL-549	Nano-electronics and Photonics	PEC	4	3	1	0	3	0
10.	PHL-550	Solar Photovoltaic and Energy Storage	PEC	4	3	1	0	3	0
11.	PHL-551	Advance Fuel Cell and Battery Technology	PEC	4	3	1	0	3	0
12.	PHL-552	MEMS and NEMS	PEC	4	3	1	0	3	0
13.	PHL-553	Advanced Ceramics and Composites	PEC	4	3	1	0	3	0

M.Tech. (Solid State Electronic Technology)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	PHT-501	Advanced Materials for Energy Harvesting and Storage	STAR	3	3	0	0	3	0
2.	PHT-502	Functional Materials	STAR	3	3	0	0	3	0
3.	PHT-503	Fundamentals of Nanoscience and Technology	STAR	3	3	0	0	3	0
4.	PHT-504	Computational Science with Python	STAR	3	2	0	2	3	0
5.	PHT-505	Quantum Simulations	STAR	3	2	0	2	3	0
6.	PHT-506	Superconducting Qubits-based Quantum Computing	STAR	3	3	0	0	3	0

DEPARTMENT OF PHYSICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Photonics)**
Department: **Department of Physics**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	PHC-501	Numerical Analysis and Computational Techniques	PCC	3	2	0	2	3	0
2.	PHC-507	Semiconductor Device Physics	PCC	4	3	1	0	3	0
3.	PHC-511	Laboratory Work in Photonics	PCC	3	0	0	6	0	6
4.	PHC-513	Optical Electronics	PCC	4	3	1	0	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**16**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	PHC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

DEPARTMENT OF PHYSICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Photonics)**
Department: **Department of Physics**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	PHC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	PHC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	PHC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	16	21	13	14
Total Credits	**64**			

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M.Tech. (Photonics)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	PHL-542	Analog Integrated Circuit Design	PEC	4	3	1	0	3	0
2.	PHL-543	Digital Signal Processing	PEC	4	3	1	0	3	0
3.	PHL-549	Nano-electronics and Photonics	PEC	4	3	1	0	3	0
4.	PHL-550	Solar Photovoltaic and Energy Storage	PEC	4	3	1	0	3	0
5.	PHL-554	Radiation Detection and Measurements	PEC	4	3	1	0	3	0
6.	PHL-555	Optical Communication System	PEC	4	3	1	0	3	0
7.	PHL-556	Optical Networks	PEC	4	3	1	0	3	0
8.	PHL-557	Solid State Lighting	PEC	4	3	1	0	3	0
9.	PHL-558	Display Technology	PEC	4	3	1	0	3	0
10.	PHL-559	Photonic Sensors	PEC	4	3	1	0	3	0
11.	PHL-560	Photonic Analysis and Design	PEC	4	3	1	0	3	0
12.	PHL-561	Silicon Photonics	PEC	4	3	1	0	3	0
13.	PHL-562	Quantum Photonics	PEC	4	3	1	0	3	0

M.Tech. (Photonics)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	PHT-501	Advanced Materials for Energy Harvesting and Storage	STAR	3	3	0	0	3	0
2.	PHT-502	Functional Materials	STAR	3	3	0	0	3	0
3.	PHT-503	Fundamentals of Nanoscience and Technology	STAR	3	3	0	0	3	0
4.	PHT-504	Computational Science with Python	STAR	3	2	0	2	3	0
5.	PHT-505	Quantum Simulations	STAR	3	2	0	2	3	0
6.	PHT-506	Superconducting Qubits-based Quantum Computing	STAR	3	3	0	0	3	0

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DEPARTMENT OF PHYSICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Sc. (Physics)**
Department: **Department of Physics**
Year: **I**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	PHC-521	Quantum Mechanics-I	PCC	4	3	1	0	3	0
2.	PHC-523	Advanced Mathematical Physics	PCC	4	3	1	0	3	0
3.	PHC-525	Classical Electrodynamics	PCC	4	3	1	0	3	0
4.	PHC-527	Classical Mechanics	PCC	4	3	1	0	3	0
5.	PHC-529	Atomic, Molecular and Laser Physics	PCC	3	3	0	0	3	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**21**					
Semester-II (Spring)									
1.	PHC-531	Condensed Matter Physics	PPI	3	3	0	0	3	0
2.	PHC-533	Statistical Mechanics	PPI	3	3	0	0	3	0
3.	PHC-535	Laboratory Work	PPI	3	0	0	6	0	4
4.	PHC-537	Elements of Nuclear and Particle Physics	PPI	3	3	0	0	3	0
5.	PHC-539	Physics of Earth's Atmosphere	PPI	2	2	0	0	2	0
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	PHC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**19**					

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DEPARTMENT OF PHYSICS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Sc. (Physics)**
Department: **Department of Physics**
Year: **II**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	PHC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	PHC-543	Computational Physics	PPI	3	2	0	2	3	0
3.	PHC-545	Semiconductor Devices and Applications	PPI	3	3	0	0	3	0
4.	PHC-547	Quantum Mechanics - II	PPI	3	3	0	0	3	0
5.		Program Elective-I	PPI	4	-	-	-	-	-
6.		Program Elective-II	PPI	3	-	-	-	-	-
7.		Project-I	PROJECT	2					
		Total		**21**					
Semester-II (Spring)									
1.		Program Elective-III	PEC	4	-	-	-	-	-
2.		Program Elective-IV	PEC	4	-	-	-	-	-
3.	PHC-602	Project-II	PROJECT	9	-	-	-	-	-
		Total		**17**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	21	19	21	17
Total Credits	**78**			

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M.Sc. (Physics)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	PHL-502	Physics of Nanosystems	PEC	4	3	1	0	3	0
2.	PHL-504	Fiber and Nonlinear Optics	PEC	4	3	1	0	3	0
3.	PHL-505	Quantum Optics	PEC	4	3	1	0	3	0
4.	PHL-508	Introduction to Superstring Theory	PEC	4	3	1	0	3	0
5.	PHL-510	Advanced Characterization Techniques	PEC	4	3	1	0	3	0
6.	PHL-511	Atomic and Molecular Collision Physics	PEC	4	3	1	0	3	0
7.	PHL-513	Astrophysics	PEC	4	3	1	0	3	0
8.	PHL-514	Solar-Terrestrial Physics	PEC	4	3	1	0	3	0
9.	PHL-515	General Relativity	PEC	4	3	1	0	3	0
10.	PHL-516	Computational Nuclear Physics	PEC	4	3	1	0	3	0
11.	PHL-517	Particle Physics	PEC	4	3	1	0	3	0
12.	PHL-521	Weather Forecasting	PEC	4	3	1	0	3	0
13.	PHL-522	Nuclear Instrumentation	PEC	4	3	1	0	3	0
14.	PHL-523	Physics and Technology of Thin Films	PEC	4	3	1	0	3	0
15.	PHL-524	Advanced Nuclear Reactions	PEC	4	3	1	0	3	0
16.	PHL-525	Semiconductor Photonics	PEC	4	3	1	0	3	0
17.	PHL-526	Advanced Light Sources	PEC	4	3	1	0	3	0

18.	PHL-527	Superconducting Radio Frequency for Particle Accelerators	PEC	4	3	1	0	3	0
19.	PHL-528	Advanced Condensed Matter Physics	PEC	4	3	0	3	3	0
20.	PHL-529	Advanced Atmospheric Physics	PEC	4	3	0	3	3	0
21.	PHL-530	Advanced Laser Physics	PEC	4	3	0	3	3	0
22.	PHL-531	Advanced Nuclear Physics	PEC	4	3	0	3	3	0
23.	PHL-532	Advanced Quantum Field Theory	PEC	4	3	1	0	3	0
24.	PHL-533	Quantum Computing for Many Body Systems	PEC	4	3	1	0	3	0
25.	PHL-534	Nuclear Astrophysics	PEC	3	3	0	0	3	0
26.	PHL-535	Superfluidity and Superconductivity	PEC	3	3	0	0	3	0
27.	PHL-536	Advanced Topics in Mathematical Physics	PEC	3	3	0	0	3	0
28.	PHL-537	Advanced Electroceramics Technology	PEC	3	3	0	0	3	0
29.	PHL-538	A Primer in Quantum Field Theory	PEC	3	3	0	0	3	0
30.	PHL-539	Advanced Atomic and Molecular Physics	PEC	3	3	0	0	3	0
31.	PHL-540	Quantum Theory of Solids	PEC	3	3	0	0	3	0

M.Sc. (Physics)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	PHT-501	Advanced Materials for Energy Harvesting and Storage	STAR	3	3	0	0	3	0
2.	PHT-502	Functional Materials	STAR	3	3	0	0	3	0
3.	PHT-503	Fundamentals of Nanoscience and Technology	STAR	3	3	0	0	3	0
4.	PHT-504	Computational Science with Python	STAR	3	2	0	2	3	0
5.	PHT-505	Quantum Simulations	STAR	3	2	0	2	3	0
6.	PHT-506	Superconducting Qubits-based Quantum Computing	STAR	3	3	0	0	3	0

DEPARTMENT OF CHEMISTRY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Sc. (Chemistry)**
Department: **Department of Chemistry**
Year: **I**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	CYC-501	Quantum Chemistry, Symmetry and Group Theory	PCC	4	3	1	0	3	0
2.	CYC-503	Thermodynamics, Interfaces and Solids	PCC	3	3	0	0	3	0
3.	CYC-505	Advanced Analytical Methods	PCC	3	3	0	0	3	0
4.	CYC-507	Structure and Reactivity of Organic Molecules	PCC	3	3	0	0	3	0
5.	CYC-509	Coordination Chemistry	PCC	3	3	0	0	3	0
6.	CYC-511	Organic Chemistry Laboratory	PCC	3	0	0	6	0	6
7.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**21**					
Semester-II (Spring)									
1.	CYC-502	Advanced Organometallic Chemistry	PPI	3	3	0	0	3	0
2.	CYC-504	Kinetics and Photochemistry	PPI	3	3	0	0	3	0
3.	CYC-506	Organic Reaction Mechanisms	PPI	3	3	0	0	3	0
4.	CYC-508	Molecular Spectroscopy	PPI	3	2	0	2	3	0
5.	CYC-510	Inorganic Chemistry Laboratory	PPI	3	0	0	6	0	6
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	CYC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**20**					

DEPARTMENT OF CHEMISTRY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Sc. (Chemistry)**
Department: **Department of Chemistry**
Year: **II**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	CYC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	CYC-513	Physical Chemistry Laboratory	PPI	3	0	0	6	0	6
3.		Program Elective-I	PPI	3	-	-	-	-	-
4.		Program Elective-II	PPI	3	-	-	-	-	-
5.		Program Elective-III	PPI	3	-	-	-	-	-
6.		Program Elective-IV	PPI	3	-	-	-	-	-
7.	CYC-601	Project-I	PROJECT	2	0	0	4	0	0
		Total		**20**					
Semester-II (Spring)									
1.		Program Elective-V	PEC	3	-	-	-	-	-
2.		Program Elective-VI	PEC	3	-	-	-	-	-
3.	CYC-602	Project-II	PROJECT	10	0	0	20	0	0
		Total		**16**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	21	20	20	16
Total Credits	**77**			

M.Sc. (Chemistry)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	CYL-501	Chemistry of Main Group and Transition Metals	PEC	3	3	0	0	3	0
2.	CYL-502	Drug Design and Synthesis	PEC	3	3	0	0	3	0
3.	CYL-512	Nuclear and Radiochemistry	PEC	3	3	0	0	3	0
4.	CYL-518	Structure, Bonding and Properties of Solids	PEC	3	3	0	0	3	0
5.	CYL-520	Inorganic Rings and Polymers	PEC	3	3	0	0	3	0
6.	CYL-522	Synthesis and Properties of Materials	PEC	3	3	0	0	3	0
7.	CYL-606	Total Synthesis	PEC	3	3	0	0	3	0
8.	CYL-607	Electroanalytical Chemistry	PEC	3	3	0	0	3	0
9.	CYL-608	Chemical Biology	PEC	3	3	0	0	3	0
10.	CYL-609	Inorganic Biochemistry and Reaction Mechanism	PEC	3	3	0	0	3	0
11.	CYL-610	Molecular Modelling and Simulations	PEC	3	2	0	2	2	0
12.	CYL-612	Carbon Nanomaterials and their Applications	PEC	3	3	0	0	3	0
13.	CYL-613	Frontiers in Inorganic Biochemistry	PEC	3	3	0	0	3	0
14.	CYL-614	Asymmetric Synthesis	PEC	3	3	0	0	3	0
15.	CYL-615	Crystal and Molecular Structure	PEC	3	2	0	2	2	0
16.	CYL-617	Supramolecular Chemistry	PEC	3	3	0	0	3	0
17.	CYL-621	Organic Structure Determination	PEC	3	3	0	0	3	0

18.	CYL-623	Organic Semiconductors	PEC	3	3	0	0	3	0
19.	CYL-625	Proteins and Polypeptides	PEC	3	3	0	0	3	0
20.	CYL-627	Solid State Chemistry and Applications	PEC	3	3	0	0	3	0
21.	CYL-629	Advanced Topics in Statistical Mechanics, and Quantum Chemistry	PEC	3	3	0	0	3	0
22.	CYL-633	Nanoscale Materials: Properties and Applications	PEC	3	3	0	0	3	0
23.	CYL-635	Advanced Magnetic Resonance Spectroscopy	PEC	3	3	0	0	3	0
24.	CYL-638	Reactivity, Structure Determination, Devices and Electronic Structure of Solids	PEC	3	2	0	2	3	0
25.	CYL-640	Organic Materials	PEC	3	2	0	2	3	0
26.	CYL-642	Computational Methods in Material Science	PEC	3	2	0	2	3	0
27.	CYL-644	High Energy Density Materials	PEC	3	3	0	0	3	0
28.	CYL-646	Fluorescence and Ultrafast Spectroscopy	PEC	3	3	0	0	3	0
29.	CYL-648	Synthesis and Applications of Tetrapyrroles	PEC	3	3	0	0	3	0
30.	CYL-703	Advanced Material Characterization Techniques	PEC	4	3	1	0	3	0
31.	CYL-902	Advanced Inorganic Chemistry	PEC	3	3	0	0	3	0
32.	CYL-903	Advanced Organic Chemistry	PEC	3	3	0	0	3	0
33.	CYL-904	Advanced Physical Chemistry	PEC	3	3	0	0	3	0
34.	CYL-905	Spectroscopic Methods of Structural Elucidation	PEC	4	3	1	0	3	0

M.Sc. (Chemistry)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	CYT-501	Computational Approaches to Catalysis & Reaction Design	STAR	3	2	0	2	3	0
2.	CYT-502	Materials Chemistry: Synthesis and Application	STAR	3	3	0	0	3	0
3.	CYT-503	Advanced Instrumentation Techniques in Scientific Research	STAR	3	3	0	0	3	0

DEPARTMENT OF EARTH SCIENCES
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

ProgramCode: **XXX M.Sc. (Applied Geology)**
Department: **Department of Earth Sciences**
Year: **I**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ESC-501	Mineralogy	PCC	4	3	0	2	3	0
2.	ESC-503	Geochemistry	PCC	4	3	0	2	3	0
3.	ESC-505	Igneous Petrology	PCC	4	3	0	2	3	0
4.	ESC-507	Structural Geology	PCC	4	3	0	2	3	0
5.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.	ESC-502	Field Training-I	PPI	2	-	-	-	-	-
2.	ESC-504	Applied Paleontology	PPI	3	2	0	2	3	0
3.	ESC-506	Metamorphic Petrology	PPI	3	2	0	2	3	0
4.	ESC-508	Geomorphology	PPI	3	2	1	0	3	0
5.	ESC-510	Economic and Ore Geology	PPI	3	2	0	2	3	0
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	ESC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**19**					

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DEPARTMENT OF EARTH SCIENCES
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Sc. (Applied Geology)**
Department: **Department of Earth Sciences**
Year: **II**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.		Internship Social Activity	ISA	3	-	-	-	-	-
2.	ESC-511	Sedimentology and Stratigraphy	PPI	4	3	0	2	3	0
3.	ESC-513	Geophysical Prospecting	PPI	3	2	0	2	3	0
4.		Program Elective-I	PPI	3	2	1	0	3	0
5.		Program Elective-II	PPI	3	2	1	0	3	0
6.		Program Elective-III	PPI	3	2	1	0	3	0
		Total		**19**					
Semester-II (Spring)									
1.	ESC-601	Project	Project	8	-	-	-	-	-
2.	ESC-602	Field Training-II	Project	2	-	-	-	-	-
3.		Program Elective-IV	PEC	4	3	1	0	3	-
4.		Program Elective-V	PEC	4	3	1	0	3	-
		Total		**18**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	**18**	**19**	**19**	**18**
Total Credits	**74**			

M.Sc. (Applied Geology)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ESL-501	Himalayan Geodynamics	PEC	3	2	1	0	3	0
2.	ESL-502	Computational Thermodynamic Modelling	PEC	3	2	1	0	3	0
3.	ESL-503	Shear Zone Processes	PEC	3	2	1	0	3	0
4.	ESL-504	Plate Tectonics	PEC	3	2	1	0	3	0
5.	ESL-505	Paleoecology	PEC	3	2	1	0	3	0
6.	ESL-506	Geohydrology	PEC	3	2	1	0	3	0
7.	ESL-507	Contaminant Hydrology	PEC	3	2	1	0	3	0
8.	ESL-508	Mineral Exploration and Mining Exploration	PEC	3	2	1	0	3	0
9.	ESL-509	Petroleum Geology	PEC	3	2	1	0	3	0
10.	ESL-510	Well Logging	PEC	3	2	1	0	3	0
11.	ESL-511	Oceanography	PEC	3	2	1	0	3	0
12.	ESL-512	Carbonate Sequence Stratigraphy	PEC	3	2	1	0	3	0
13	ESL-513	Basin Analysis	PEC	4	3	1	0	3	0
14.	ESL-514	Remote Sensing	PEC	4	3	1	0	3	0
15.	ESL-515	Isotope Geochemistry	PEC	4	3	1	0	3	0
16.	ESL-516	Engineering Geology	PEC	4	3	1	0	3	0
17.	ESL-517	Principles of GIS	PEC	4	3	1	0	3	0
18.	ESL-518	Coal Petrology	PEC	4	3	1	0	3	0
19.	ESL-519	Reservoir Geomechanics	PEC	4	3	1	0	3	0
20.	ESL-520	Analytical Techniques in Geosciences	PEC	4	3	1	0	3	0

M.Sc. (Applied Geology)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EST-501	Computer Programming and Numerical Techniques in Geosciences	STAR	3	2	1	0	3	0
2.	EST-502	Fundamentals of ML in Geosciences	STAR	3	2	1	0	3	0

DEPARTMENT OF ARCHITECTURE AND PLANNING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Architecture**
Department: **Department of Architecture and Planning**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ARC-611	Sustainable Built Environment	PCC	3	2	1	0	3	0
2.	ARC-613	Advanced Building Technologies	PCC	3	2	1	0	3	0
3.	ARC-615	Urban Design	PCC	3	2	1	0	3	0
4.	ARC-617	Contemporary World Architecture	PCC	3	2	1	0	3	0
5.	ARC-619	Architectural Design Studio-I	PCC	4	1	0	8	-	-
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	3	-	-	-	-	-
3.		Program Elective-III	PEC	3	-	-	-	-	-
4.		Program Elective-IV	PEC	3	-	-	-	-	-
5.		Program Elective-V	PEC	3	-	-	-	-	-
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	ARC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF ARCHITECTURE AND PLANNING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Architecture**
Department: **Department of Architecture and Planning**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ARC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	ARC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	ARC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

Master of Architecture

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ARL-601	Architectural Design Studio-II	PEC	4	0	0	8	0	0
2.	ARL-602	Sustainable Materials and Technologies	PEC	3	2	1	0	3	0
3.	ARL-603	Building Performance Evaluation	PEC	3	2	1	0	3	0
4.	ARL-604	Megastructures and Futuristic Construction Technologies	PEC	3	2	1	0	3	0
5.	ARL-605	Construction Planning and Management	PEC	3	2	1	0	3	0
6.	ARL-606	Building Operations & Management	PEC	3	2	1	0	3	0
7.	ARL-607	Digital Forms and Generative Architecture	PEC	3	2	1	2/2	3	0
8.	ARL-608	Contemporary Indian Architecture	PEC	3	2	1	0	3	0
9.	ARL-609	Architectural Theory and Criticism	PEC	3	2	1	0	3	0
10.	ARL-610	Design Thinking for Built Environment	PEC	3	2	1	0	3	0
11.	ARL-611	Architecture and Urban Conservation	PEC	3	2	1	0	3	0
12.	ARL-612	Vernacular Architecture	PEC	3	2	1	0	3	0
13.	ARL-613	Interior Architecture and Material Culture	PEC	3	2	1	0	3	0
14.	ARL-614	Urban Public Spaces	PEC	3	2	1	0	3	0
15.	ARL-615	Universal Accessibility and Inclusion in Built Environment	PEC	3	2	1	0	3	0
16.	ARL-616	Cities for Mental Well Being	PEC	3	2	1	0	3	0
17.	ARL-617	Designing for Urban Childhoods	PEC	3	2	1	0	3	0

18.	ARL-618	Built Environment for Ageing Futures	PEC	3	2	1	0	3	0
19.	ARL-619	Ecology and Sustainable Development	PEC	3	2	1	0	3	0
20.	ARL-620	Climate Change, Policies and Regulations for Sustainability	PEC	3	2	1	0	3	0
21.	ARL-621	Research Methods in Architecture and Planning	PEC	3	2	1	0	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ART-501	Building Information Modelling	STAR	3	2	1	0	3	0

Social Sciences Course Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ARS-501	Architecture and Society	SSC	2	2	0	0	2	0
2.	ARS-502	Visual Narratives and Photo Essays in Built Environment	SSC	2	2	0	0	2	0
3.	ARS-503	Environment and Behaviour Studies	SSC	2	2	0	0	2	0

DEPARTMENT OF ARCHITECTURE AND PLANNING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Urban and Rural Planning**
Department: **Department of Architecture and Planning**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ARC-621	Planning Legislation and Governance	PCC	3	2	1	0	3	0
2.	ARC-623	Planning Theory	PCC	3	2	1	0	3	0
3.	ARC-625	Infrastructure Planning	PCC	3	2	1	0	3	0
4.	ARC-627	GIS and Remote Sensing Techniques	PCC	3	2	1	0	3	0
5.	ARC-629	Planning Studio-I	PCC	4	0	0	8	-	-
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	3	-	-	-	-	-
3.		Program Elective-III	PEC	3	-	-	-	-	-
4.		Program Elective-IV	PEC	3	-	-	-	-	-
5.		Program Elective-V	PEC	3	-	-	-	-	-
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	ARC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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DEPARTMENT OF ARCHITECTURE AND PLANNING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Urban and Rural Planning**
Department: **Department of Architecture and Planning**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	ARC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	ARC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	ARC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

Master of Urban and Rural Planning

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ARL-622	Planning Studio-II	PEC	4	0	0	8	0	0
2.	ARL-623	Sustainable Urban Transport Planning	PEC	3	2	1	0	3	0
3.	ARL-624	Urban Utilities and Services	PEC	3	2	1	0	3	0
4.	ARL-625	Mega Infrastructure	PEC	3	2	1	0	3	0
5.	ARL-626	Housing Policy and Planning	PEC	3	2	1	0	3	0
6.	ARL-627	Land Management	PEC	3	2	1	0	3	0
7.	ARL-628	Real Estate Management	PEC	3	2	1	0	3	0
8.	ARL-629	Urbanization and Globalization	PEC	3	2	1	0	3	0
9.	ARL-630	Regional Planning	PEC	3	2	1	0	3	0
10.	ARL-631	Rural Planning and Development	PEC	3	2	1	0	3	0
11.	ARL-632	Climate Change Adaptation and Disaster Risk Resilience	PEC	3	2	1	0	3	0
12.	ARL-633	Environmental Impact Assessment	PEC	3	2	1	0	3	0
13.	ARL-619	Ecology and Sustainable Development	PEC	3	2	1	0	3	0
14.	ARL-634	Big Data and Urban Analytics	PEC	3	2	1	0	3	0
15.	ARL-635	AI and ML Application in Planning	PEC	3	2	1	0	3	0
16.	ARL-636	Urban Dynamics	PEC	3	2	1	0	3	0
17.	ARL-637	Advanced Strategic Decision Making	PEC	3	2	1	0	3	0

18.	ARL-638	Urban Economics	PEC	3	2	1	0	3	0
19.	ARL-639	Infrastructure Project Finance and Management	PEC	3	2	1	0	3	0
20.	ARL-640	Public Policy Analysis	PEC	3	2	1	0	3	0
21.	ARL-641	Professional Practice in Planning	PEC	3	2	1	0	3	0
22.	ARL-642	Urban Management	PEC	3	2	1	0	3	0
23.	ARL-643	Research Methodology for Planning and Architecture	PEC	3	2	1	0	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ART-502	Fundamental of Town Planning	STAR	3	2	1	0	3	0

Social Sciences Course Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	ARS-504	Socio Economic for Planning	SSC	2	2	0	0	2	0

DEPARTMENT OF MANAGEMENT STUDIES
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Business Administration**
Department: **Department of Management Studies**
Year: **I**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Term-I (Autumn)									
1.	BMC-501	Principles and Practice of Management	PCC	1.5	3	0	0	2	0
2.	BMC-502	Managerial Economics	PCC	2.0	4	0	0	3	0
3.	BMC-503	Financial Accounting	PCC	2.0	3	1	0	3	0
4.	BMC-504	Marketing Management-1	PCC	1.5	3	0	0	2	0
5.	BMC-505	Business Statistics	PCC	2.0	2	0	2	2	0
6.	BMC-506	IT and Organisation	PCC	1.5	3	0	0	2	0
7.		Social Science Course	SSC	-	-	-	-	-	-
		Total		**10.5**					
Term-II (Autumn)									
1.	BMC-507	Managerial Communication	PCC	1.5	0	0	3	0	0
2.	BMC-508	Marketing Management-2	PCC	1.5	3	0	0	2	0
3.	BMC-509	Organisational Behaviour	PCC	1.5	3	0	0	2	0
4.	BMC-510	Management Accounting	PCC	2.0	3	1	0	3	0
5.	BMC-511	Production and Operations Management-1	PCC	1.5	3	0	0	2	0
6.	BMC-512	Business Environment	PCC	1.5	2	1	0	2	0
7.		Social Science Course	SSC	2.0	-	-	-	-	-
		Total		**11.5**					

DEPARTMENT OF MANAGEMENT STUDIES
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Business Administration**
Department: **Department of Management Studies**
Year: **I**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Term-III (Spring)									
1.	BMC-513	Production and Operations Management-2	PPI	1.5	3	0	0	2	0
2.	BMC-514	Financial Management	PPI	2.0	3	1	0	3	0
3.	BMC-515	Operations Research	PPI	1.5	2	1	0	2	0
4.	BMC-516	Digital Transformation	PPI	1.5	3	0	0	2	0
5.	BMC-517	Strategic Management-1	PPI	2.0	4	0	0	3	0
6.		Science, Technology, and Advanced Research-tools	STAR	-	-	-	-	-	-
7.	BMC-700	Seminar	SEM	2.0	-	-	-	-	-
		Total		**10.5**					
Term-IV (Spring)									
1.	BMC-518	Strategic Management-2	PPI	1.5	3	0	0	2	0
2.	BMC-519	Human Resource Management	PPI	1.5	3	0	0	2	0
3.	BMC-520	Business Research Methods	PPI	1.5	2	1	0	2	0
4.	BMC-521	Data Science for Managers	PPI	1.5	0	0	3	0	2
5.	BMC-522	Legal Aspect of Business	PPI	1.5	3	0	0	2	0
6.		Science, Technology, and Advanced Research-tools	STAR	3.0	-	-	-	-	-
		Total		**10.5**					

DEPARTMENT OF MANAGEMENT STUDIES
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Business Administration**
Department: **Department of Management Studies**
Year: **II**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Term-V (Autumn)									
1.	BMC-523	Capstone Project	Project	1.5	0	0	6	0	0
2.	BMC-691	Internship Social Activity	ISA	2.0	-	-	-	-	-
3.		Program Elective-I	PPI	1.5	-	-	-	-	-
4.		Program Elective-II	PPI	1.5	-	-	-	-	-
5.		Program Elective-III	PPI	1.5	-	-	-	-	-
6.		Program Elective-IV	PPI	1.5	-	-	-	-	-
		Total		**9.5**					
Term-VI (Autumn)									
1.	BMC-692	Internship Social Activity^{++}	ISA	1.0	-	-	-	-	-
2.		Program Elective-V	PPI	1.5	-	-	-	-	-
3.		Program Elective-VI	PPI	1.5	-	-	-	-	-
4.		Program Elective-VII	PPI	1.5	-	-	-	-	-
5.		Program Elective-VIII	PPI	1.5	-	-	-	-	-
6.		Program Elective-IX	PPI	1.5	-	-	-	-	-
7.		Program Elective-X	PPI	1.5	-	-	-	-	-
		Total		**10.0**					

DEPARTMENT OF MANAGEMENT STUDIES
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX Master of Business Administration**
Department: **Department of Management Studies**
Year: **II**
Model: **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Term-VII (Spring)									
1.		Program Elective-XI	PEC	1.5	-	-	-	-	-
2.		Program Elective-XII	PEC	1.5	-	-	-	-	-
3.		Program Elective-XIII	PEC	1.5	-	-	-	-	-
4.		Program Elective-XIV	PEC	1.5	-	-	-	-	-
5.		Program Elective-XV	PEC	1.5	-	-	-	-	-
		Total		**7.5**					
Term-VIII (Spring)									
1.	BMC-601	Project	Project	6.0	-	-	-	-	-
		Total		**6.0**					

* SSC(Term 1&2) and STAR (Term 3&4) course will be conducted across two terms.
++ This 1 credit will be evaluated on the basis of participation in workshops organized for the topics under managerial skill enhancement basket.

- Award of specialisation: A student must earn 10 credits for a specialisation.
- Credit requirements for the specialisation will be completed using PECs/ STAR/ 8th term Project.

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Master of Business Administration

Program Elective Courses

Open Electives

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	BML-501	Knowledge Management	PEC	1.5	3	0	0	2	-
2.	BML-502	Entrepreneurship Development	PEC	1.5	3	0	0	2	-
3.	BML-503	Industrial Waste Management	PEC	1.5	3	0	0	2	-
4.	BML-504	Management of Large Systems	PEC	1.5	3	0	0	2	-
5.	BML-505	Environment Management	PEC	1.5	3	0	0	2	-
6.	BML-506	Advanced Optimization Techniques for Management	PEC	1.5	3	0	0	2	-
7.	BML-507	Basics of Management of Information	PEC	1.5	3	0	0	2	-
8.	BML-508	Soft Computing Techniques for Management	PEC	1.5	3	0	0	2	-
9.	BML-509	Technology Management	PEC	1.5	3	0	0	2	-
10.	BML-510	Sustainable Development Goals	PEC	1.5	3	0	0	2	-

Managerial Skills Enhancement Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	BML-586	Business Ethics	PEC	0	-	-	-	-	-
2.	BML-587	Hands on Experience on Product Development Tools	PEC	0	-	-	-	-	-
3.	BML-588	Working with Spreadsheet	PEC	0	-	-	-	-	-
4.	BML-589	Innovation and Creativity	PEC	0	-	-	-	-	-
A student has to complete courses of this basket which will be non-credit but part of transcript.									

Specialization Electives

(1) Human Resource Management

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	BML-511	Human Resource Planning and Development	PEC	1.5	3	0	0	2	-
2.	BML-512	Organisational Development	PEC	1.5	3	0	0	2	-
3.	BML-513	Labour Legislation and Industrial Relations	PEC	1.5	3	0	0	2	-
4.	BML-514	Career Planning and Performance Management	PEC	1.5	3	0	0	2	-
5.	BML-515	Training and Talent Development	PEC	1.5	3	0	0	2	-
6.	BML-516	Competency Management	PEC	1.5	3	0	0	2	-

7.	BML-517	Management of Change	PEC	1.5	3	0	0	2	-
8.	BML-518	Managing Innovation and Creativity	PEC	1.5	3	0	0	2	-
9.	BML-519	Management of Self and Interpersonal Dynamics	PEC	1.5	3	0	0	2	-
10.	BML-520	Strategic Human Resource Management	PEC	1.5	3	0	0	2	-
11.	BML-521	Human Resource Analytics	PEC	1.5	3	0	0	2	-
12.	BML-522	Training of Trainers	PEC	1.5	3	0	0	2	-
13.	BML-523	Leadership and Team Management	PEC	1.5	3	0	0	2	-
14.	BML-524	Talent Acquisition and Management	PEC	1.5	3	0	0	2	-
15.	BML-525	Future of Work	PEC	1.5	3	0	0	2	-
16.	BML-526	Managing Workforce Diversity	PEC	1.5	3	0	0	2	-

(2) Operations

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	BML-527	Manufacturing Strategy	PEC	1.5	3	0	0	2	-
2.	BML-528	Service Operations Management	PEC	1.5	3	0	0	2	-
3.	BML-529	Supply Chain Management	PEC	1.5	3	0	0	2	-
4.	BML-530	Supply Chain Analytics	PEC	1.5	3	0	0	2	-
5.	BML-531	Operations Analytics	PEC	1.5	3	0	0	2	-
6.	BML-532	Project Management	PEC	1.5	3	0	0	2	-
7.	BML-533	Essential AI for Managers	PEC	1.5	3	0	0	2	-
8.	BML-534	Advanced AI for Managers	PEC	1.5	3	0	0	2	-
9.	BML-535	Game Theory for Strategic Advantage	PEC	1.5	3	0	0	2	-

10.	BML-536	Quality Management	PEC	1.5	3	0	0	2	-
11.	BML-537	Queuing Systems and Simulation	PEC	1.5	3	0	0	2	-
12.	BML-538	Advanced Quality Management	PEC	1.5	3	0	0	2	-
13.	BML-539	Case Studies in Application of Decision Models	PEC	1.5	3	0	0	2	-
14.	BML-540	Circular Supply Chain for Sustainability	PEC	1.5	3	0	0	2	-
15.	BML-541	Industrial Internet of Things for Managers	PEC	1.5	3	0	0	2	-
16.	BML-542	Spreadsheet Modelling	PEC	1.5	3	0	0	2	-
17.	BML-543	Business Analytics	PEC	1.5	3	0	0	2	-
18.	BML-544	Logistics Management	PEC	1.5	3	0	0	2	-
19.	BML-545	Logistics Analytics	PEC	1.5	3	0	0	2	-

(3) Information Technology

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	BML-546	Management of Information Technology	PEC	1.5	3	0	0	2	-
2.	BML-547	Enterprise Business Applications	PEC	1.5	3	0	0	2	-
3.*	BML-548	Information Technology Project Management	PEC	1.5	3	0	0	2	-
4.	BML-549	Software Engineering and Management of Software Development	PEC	1.5	3	0	0	2	-
5.	BML-550	Design of On-Line Systems	PEC	1.5	3	0	0	2	-
6.	BML-551	Decision Support and Experts Systems	PEC	1.5	3	0	0	2	-
7.	BML-552	Business Process Management	PEC	1.5	3	0	0	2	-
8.*	BML-553	Electronic Commerce and Applications	PEC	1.5	3	0	0	2	-

***These courses are in PEC basket of MBA specializations i.e. Information System and Marketing & Information System and Operations.**

(4) Marketing

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	BML-554	Consumer Behavior Analysis	PEC	1.5	3	0	0	2	-
2.	BML-555	Brand Management	PEC	1.5	3	0	0	2	-
3.	BML-556	Integrated Marketing Communications	PEC	1.5	3	0	0	2	-
4.	BML-557	Sales and Distribution Management	PEC	1.5	3	0	0	2	-
5.	BML-558	Pricing Strategies	PEC	1.5	3	0	0	2	-
6.	BML-559	Business to Business Marketing	PEC	1.5	3	0	0	2	-
7.	BML-560	Services Marketing	PEC	1.5	3	0	0	2	-
8.	BML-561	Digital Marketing	PEC	1.5	3	0	0	2	-
9.	BML-562	Global Marketing Management	PEC	1.5	3	0	0	2	-
10.	BML-563	Retail Management	PEC	1.5	3	0	0	2	-
11.	BML-564	Rural Marketing	PEC	1.5	3	0	0	2	-
12.	BML-565	Marketing Strategy	PEC	1.5	3	0	0	2	-
13.	BML-566	AI in Marketing	PEC	1.5	2	0	1	2	1
14.	BML-567	International Business	PEC	1.5	3	0	0	2	-
15.	BML-568	Product Management	PEC	1.5	3	0	0	2	-

(5) Financial

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	BML-569	Basics of Quantitative Finance	PEC	1.5	3	0	0	2	-
2.	BML-570	Working Capital Management	PEC	1.5	3	0	0	2	-
3.	BML-571	Security Analysis and Portfolio Management	PEC	1.5	3	0	0	2	-
4.	BML-572	Indian Financial System	PEC	1.5	3	0	0	2	-
5.	BML-573	International Corporate Finance	PEC	1.5	3	0	0	2	-
6.	BML-574	Financial Engineering	PEC	1.5	3	0	0	2	-
7.	BML-575	Applications of Quantitative Finance	PEC	1.5	3	0	0	2	-
8.	BML-576	Financial Risk Management	PEC	1.5	3	0	0	2	-
9.	BML-577	Financial Modelling	PEC	1.5	3	0	0	2	-
10.	BML-578	Banking and Bank Finance	PEC	1.5	3	0	0	2	-
11.	BML-579	Modern Financial Markets and Market Microstructure	PEC	1.5	3	0	0	2	-
12.	BML-580	Behavioral Finance	PEC	1.5	3	0	0	2	-
13.	BML-581	Business Valuation	PEC	1.5	3	0	0	2	-
14.	BML-582	Infrastructure and Project Finance	PEC	1.5	3	0	0	2	-
15.	BML-583	Money and Central Banking	PEC	1.5	3	0	0	2	-
16.	BML-584	Fintech	PEC	1.5	3	0	0	2	-
17.	BML-585	Foreign Exchange Risk Management	PEC	1.5	3	0	0	2	-

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(6) Information System

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	BML-533	Essential AI for Managers	PEC	1.5	3	0	0	2	-
2.	BML-534	Advanced AI for Managers	PEC	1.5	3	0	0	2	-
3.	BML-535	Game Theory for Strategic Advantage	PEC	1.5	3	0	0	2	-
4.	BML-539	Case Studies in Application of Decision Models	PEC	1.5	3	0	0	2	-
5.	BML-541	Industrial Internet of Things for Managers	PEC	1.5	3	0	0	2	-
6.	BML-542	Spreadsheet Modelling	PEC	1.5	3	0	0	2	-
7.	BML-543	Business Analytics	PEC	1.5	3	0	0	2	-

DEPARTMENT OF EARTHQUAKE ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Soil Dynamics)**
Department: **Department of Earthquake Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EQC-501	Dynamics of Soil and Structures	PCC	4	3	0	2	3	0
2.	EQC-503	Finite Element Method	PCC	4	3	0	2	3	0
3.	EQC-505	Geotechnical Earthquake Engineering	PCC	4	3	0	2	3	0
4.	EQC-507	Earthquake Resistant Design of Foundations	PCC	3	2	1	0	3	0
5.		Program Elective-I	PEC	4	-	-	-	-	-
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**21**					
Semester-II (Spring)									
1.		Program Elective-II	PEC	4	-	-	-	-	-
2.		Program Elective-III	PEC	4	-	-	-	-	-
3.		Program Elective-IV	PEC	4	-	-	-	-	-
4.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
5.	EQC-700	Seminar	SEM	2	-	-	-	-	-
		Total		17					

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DEPARTMENT OF EARTHQUAKE ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Soil Dynamics)**
Department: **Department of Earthquake Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EQC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	EQC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	EQC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	21	17	13	14
Total Credits	**65**			

M.Tech. (Soil Dynamics)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EQL-501	Dynamic Soil Structure Interaction	PEC	4	3	1	0	3	0
2.	EQL-502	Ground Improvement Techniques	PEC	4	3	1	0	3	0
3.	EQL-503	Machine Foundation	PEC	4	3	1	0	3	0
4.	EQL-504	Seismic Slope Stability: Earth Dams & Retaining Walls	PEC	4	3	1	0	3	0
5.	EQL-505	Constitutive Modelling in Soil Dynamics	PEC	4	3	1	0	3	0
6.	EQL-506	Offshore Geotechnical Engineering	PEC	4	3	1	0	3	0
7.	EQL-507	Numerical Methods for Dynamic Systems	PEC	4	3	1	0	3	0

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DEPARTMENT OF EARTHQUAKE ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Structural Dynamics)**
Department: **Department of Earthquake Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EQC-503	Finite Element Method	PCC	4	3	0	2	3	0
2.	EQC-511	Structural Dynamics	PCC	4	3	0	2	3	0
3.	EQC-513	Earthquake Resistant Design of Structures	PCC	4	3	0	2	3	0
4.	EQC-515	Continuum Mechanics of Solids	PCC	3	2	1	0	3	0
5.		Program Elective-I	PEC	4	-	-	-	-	-
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**21**					
Semester-II (Spring)									
1.		Program Elective-II	PEC	4	-	-	-	-	-
2.		Program Elective-III	PEC	4	-	-	-	-	-
3.		Program Elective-IV	PEC	4	-	-	-	-	-
4.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
5.	EQC-700	Seminar	SEM	2	-	-	-	-	-
		Total		17					

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DEPARTMENT OF EARTHQUAKE ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Structural Dynamics)**
Department: **Department of Earthquake Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EQC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	EQC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	EQC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	21	17	13	14
Total Credits	**65**			

M.Tech. (Structural Dynamics)

Program Elective Courses

S.No.	Subject Code	Course Title	Subject Area	Credits	Teaching Scheme: L	T	P	Contact Hours/Week: Theory	Exam Duration: Practical
1.	EQL-507	Numerical Methods for Dynamic Systems	PEC	4	3	1	0	3	0
2.	EQL-508	Advanced Earthquake Resistant Design of Structures	PEC	4	3	1	0	3	0
3.	EQL-509	Earthquake Resistant Design of Masonry Structures	PEC	4	3	1	0	3	0
4.	EQL-510	Seismic Evaluation and Retrofitting of Structures	PEC	4	3	1	0	3	0
5.	EQL-511	Earthquake Resistant Design of Bridges	PEC	4	3	1	0	3	0
6.	EQL-512	Earthquake Resistant Design of Steel Structures	PEC	4	3	1	0	3	0
7.	EQL-513	Structural Response Control for Seismic Protection	PEC	4	3	1	0	3	0
8.	EQL-514	Random Vibration	PEC	4	3	1	0	3	0
9.	EQL-515	Reliability Based Design	PEC	4	3	1	0	3	0
10.	EQL-516	Earthquake Resistant Design of Special Structures	PEC	4	3	1	0	3	0
11.	EQL-517	Experimental Techniques in Earthquake Engineering	PEC	4	3	0	2	3	0

Science, Technology, and Advanced Research-tools basket

S.No.	Subject Code	Course Title	Subject Area	Credits	Teaching Scheme: L	T	P	Contact Hours/Week: Theory	Exam Duration: Practical
1.	EQT-501	High Performance Scientific Computing	STAR	3	3	0	0	3	0

EDEPARTMENT OF EARTHQUAKE ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Seismic Vulnerability and Risk Assessment)**
Department: **Department of Earthquake Engineering**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EQC-511	Structural Dynamics	PCC	4	3	0	2	3	0
2.	EQC-521	Seismological Modelling and Simulation	PCC	4	3	0	2	3	0
3.	EQC-523	Seismic Vulnerability and Risk Analysis	PCC	4	3	0	2	3	0
4.	EQC-525	Seismic Hazard Assessment	PCC	3	2	1	0	3	0
5.		Program Elective-I	PEC	4	-	-	-	-	-
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**21**					
Semester-II (Spring)									
1.		Program Elective-II	PEC	4	-	-	-	-	-
2.		Program Elective-III	PEC	4	-	-	-	-	-
3.		Program Elective-IV	PEC	4	-	-	-	-	-
4.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
5.	EQC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**17**					

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DEPARTMENT OF EARTHQUAKE ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Seismic Vulnerability and Risk Assessment)**
Department: **Department of Earthquake Engineering**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	EQC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	EQC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	EQC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	21	17	13	14
Total Credits	**65**			

M.Tech. (Seismic Vulnerability and Risk Assessment)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EQL-518	Mechanics of Deformable Media	PEC	4	3	1	0	3	0
2.	EQL-519	Seismic Microzonation	PEC	4	3	1	0	3	0
3.	EQL-520	Earthquake Precursors and Early Warning Systems	PEC	4	3	1	0	3	0
4.	EQL-521	Physics of Earthquakes	PEC	4	3	1	0	3	0
5.	EQL-522	Geoinformatics	PEC	4	3	1	0	3	0
6.	EQL-523	Risk Management and Insurance	PEC	4	3	1	0	3	0

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EQT-502	Dynamical Systems with Machine Learning	STAR	3	2	1	0	3	0

CENTRE FOR TRANSPORTATION SYSTEMS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Transportation Systems Management)**
Centre: **Centre for Transportation Systems**
Year: **I**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	TSC-501	Transport Infrastructure Planning	PCC	3	2	1	0	3	0
2.	TSC-503	Transportation Systems Analytics	PCC	3	2	1	0	3	0
3.	TSC-505	Intelligent Transportation System	PCC	3	2	1	0	3	0
4.	TSC-507	Transportation and Health	PCC	3	2	1	0	3	0
5.	TSC-509	Transportation Planning and Management	PCC	4	0	0	8	0	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	3	-	-	-	-	-
2.		Program Elective-II	PEC	3	-	-	-	-	-
3.		Program Elective-III	PEC	3	-	-	-	-	-
4.		Program Elective-IV	PEC	3	-	-	-	-	-
5.		Program Elective-V	PEC	3/4	-	-	-	-	-
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	TSC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**20/21**					

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CENTRE FOR TRANSPORTATION SYSTEMS
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Transportation Systems Management)**
Centre: **Centre for Transportation Systems**
Year: **II**
Model: **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	TSC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	TSC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	TSC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	20/21	13	14
Total Credits	**65/66**			

M.Tech. (Transportation Systems Management)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	TSL-501	Public Transport Operations and Management	PEC	3	2	1	0	3	0
2.	TSL-502	Freight Transportation Planning and Management	PEC	3	2	1	0	3	0
3.	TSL-503	Advance Transportation Analytics	PEC	3	2	1	0	3	0
4.	TSL-504	Management of Transportation Projects	PEC	3	2	1	0	3	0
5.	TSL-505	Planning and Management of Non-motorized Transport	PEC	3	2	1	0	3	0
6.	TSL-506	Geographical Information System (GIS) Applications in transportation Systems	PEC	4	3	0	2	3	0
7.	TSL-507	Active Mobility and Health	PEC	3	2	1	0	3	0
8.	TSL-508	Design and Rejuvenation of Urban Transport	PEC	3	2	1	0	3	0
9.	TSL-509	Sustainable Transportation Systems	PEC	3	2	1	0	3	0
10.	TSL-510	Ropeway Infrastructure Planning and Design	PEC	3	2	1	0	3	0
11.	TSL-511	Multimodal Transportation	PEC	3	2	1	0	3	0
12.	TSL-512	Inland Navigation and Water Transport	PEC	3	2	1	0	3	0
13.	TSL-513	Advance Transport Planning	PEC	3	2	1	0	3	0
14.	TSL-514	Airport Planning and Design	PEC	3	2	1	0	3	0
15.	TSL-515	Road Traffic Safety	PEC	4	3	0	2	3	0
16.	TSL-516	Transport Economics	PEC	3	2	1	0	3	0
17.	TSL-517	EV Charging Infrastructure	PEC	3	2	1	0	3	0

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M.Tech. (Transportation Systems Management)

Science, Technology, and Advanced Research-tools basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	TST-501	Sustainable Transportation Systems	STAR	3	2	1	0	3	0

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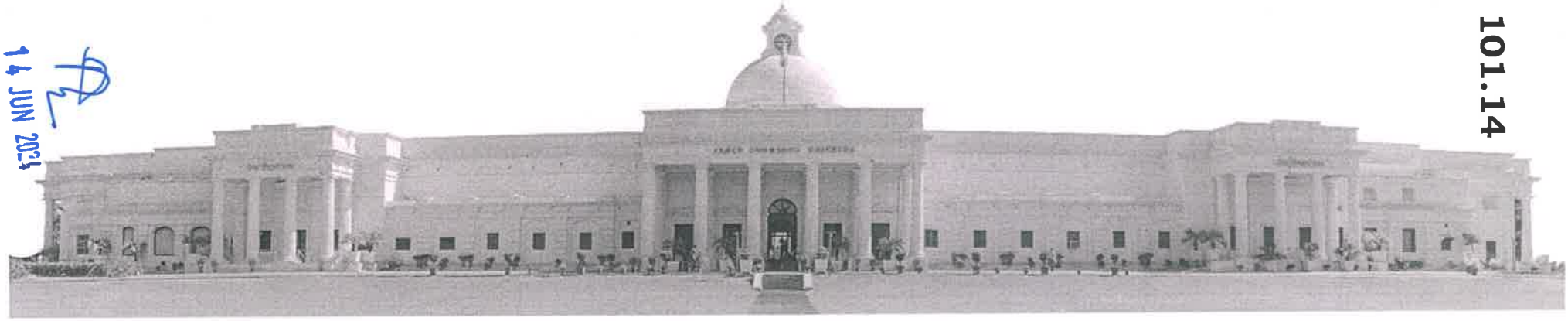
VIKSIT BHARAT@2047:
Deliberations in Senate, IIT Roorkee

100 YEARS
विकसित भारत अभियान
1947 TO 2047



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Themes Shared by Ministry on Sectoral Vision

- **Empowered Citizens**
  - Health, education, Nari Shakti, culture, caring society
- **Thriving and Sustainable Economy**
  - Industry, Energy, Agriculture, Infra, Green economy and cities.
- **Technology & Innovation Leadership**
  - R&D, startups and digital
- **Effective Governance**
- **Bharat as Vishwabandhu**

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Suggestions for Transformation in selected Sectors

Empowered Citizens

Holistic, Quality & Affordable Health, Wellness for all

- Investments in healthcare infrastructure and studies.
- Prioritizing healthcare research

Education & Skilling for the Future

- Overhauling our education system. Invest in teacher training, update curriculum to meet the needs of the future.
- Make education accessible to all socio-economic backgrounds.

Naari Shakti - Women-led Development & Inclusive Society

- The reformation of schooling systems to sell inclusivity, tolerance, and cultural knowledge is pivotal.
- Policy implementations that empower girls, and eradicate discrimination will lead to a socially cohesive society.

Thriving & Sustainable Economy

Agriculture & Rural Economy

- Agriculture needs a technology boost, focus farmer education, infrastructure development, and market reforms.

Industry of the Future

- Industries should adopt green practices, incentivized through policies that promote sustainability.

Service of the Future

- Services can be enhanced through digital inclusion, skill development, and entrepreneurship support.

Technology Innovation & Leadership

Frontier Technologies for the Future

- Students should be encouraged to love science. Scientists and researchers need to be supported.
- Technology should be used wisely, like having a good internet and learning how to use computers.
- Startups need help to start their businesses.
- Curriculum overhaul that integrates practical learning and research projects - encouraging collaboration between academia and industry.

Digital Public Infrastructure - Digitizing Bharat & Beyond

- Digital Infrastructure: Invest in constructing strong digital infrastructure, ensuring excessive-velocity net connectivity across city and rural regions.
- Digital Literacy Programs: Implement comprehensive virtual literacy applications to ensure everybody, irrespective of heritage, has the necessary skills to navigate and utilize digital technologies effectively.
- Cybersecurity Measures: Prioritize cybersecurity measures to guard virtual infrastructure and shield citizens' statistics and privacy.

- **Startup Ecosystem:** Provide financial incentives, incubation facilities, and mentorship and guide startups.
- Regulatory Reforms: Create favorable regulatory environments that facilitate the ease of doing enterprise for startups
- Industry-Academia Collaboration: Promote collaborations between startups, academia, and mounted industries.
- Education & Research Institutions: STEM Education Emphasis
- Research -Focused Universities: Invest in research -focused universities and establishments.
- Industry Partnerships: Forge more potent ties between academic establishments and industries

Empowered Citizens

Holistic, Quality & Affordable Health, Wellness for all

IITR advocates for the implementation of telemedicine to extend healthcare access to remote and underserved populations.

Healthcare Infrastructure: IITR emphasizes the importance of investing in robust healthcare infrastructure, including the development of hospitals, clinics, and telemedicine facilities. Adequate infrastructure is essential to ensure equitable access to healthcare services and to meet the evolving healthcare needs.

Public Health Campaigns: Launching public health campaigns is crucial to raise awareness about preventive measures and promoting healthy lifestyles.

Education & Skilling for the Future

Technology Integration: IITR advocates for the incorporation of advanced technologies, such as artificial intelligence (AI), to facilitate personalized learning experiences.

Global Perspectives: To integrate global perspectives seamlessly into the curriculum, ensuring that students are equipped with the cultural competence and global awareness necessary to thrive in an interconnected world.

Investment in Education: Advocate for increased investment, both public and private, in educational infrastructure, faculty development, and technological resources.

Curriculum Reform: Emphasize the importance of continuous review and reform to align with evolving global standards and industry requirements.

Suggestive steps for reaching the identified goals

Education and Skills STEM Focus:

concerted effort to strengthen STEM education. Enhancing STEM curriculum, resources, and teaching methodologies, the institute aims to equip students with the critical thinking, problem-solving, and technical skills essential for success.

- Lifelong Learning Programs: IITR advocates for the implementation of lifelong learning initiatives that offer flexible and accessible education opportunities for individuals at all stages of their careers.
- Curriculum Relevance – As per changing global needs
- Skill Certification Programs: Establishment of nationwide skill certification programs to validate and recognize individuals' competencies and qualifications.
- Industry-Academia Partnerships: Collaboration between educational institutions and industries to bridge the gap between academia and the workplace like TechSarthi. Which can be complemented by industry-integrated internships programs.
- Online Learning Platforms: Expanding accessible online learning platforms is integral to democratizing education and promoting continuous learning.
- Reskilling Initiatives: In response to the rapid pace of technological advancement and industry disruption, the institute advocates for the launch of reskilling programs aimed at professionals in emerging technologies.

Naari Shakti - Women-led Development

- Implementation and rigorous enforcement of legal reforms aimed at safeguarding women's rights and ensuring their safety. More schemes on the lines of Gender Advancement for Transforming Institutions (GATI) which usher a novel intervention programme for promoting gender equity in science and technology.

- Schemes like Golden Girl and "S.A.K.U.N.T.A.L.A"

Caring & Inclusive Society

IITRs commitment lies in nurturing a caring society that places a strong emphasis on environmental sustainability. By promoting eco-conscious practices and advocating for policies that prioritize conservation and renewable resources, we strive to safeguard our planet for future generations.

- Youth Engagement: IITR believes in fostering the active participation of youth in community-building initiatives.
- Social Welfare Reforms: that address key challenges such as poverty, unemployment, and healthcare disparities.
- Community Empowerment: community-driven initiatives and promoting volunteerism as pillars of a caring society.

Thriving & Sustainable Economy

Agriculture & Rural Economy

Agriculture needs a technology boost, focus farmer education, infrastructure development, and market reforms.

Industry of the Future

Industries should adopt green practices, incentivized through policies that promote sustainability.

Service of the Future

Services can be enhanced through digital inclusion, skill development, and entrepreneurship support. Building robust infrastructure requires strategic planning, investment, and commitment to balanced development.

Frontier Technologies for the Future

IITR prioritizes substantial investments in space research to assert leadership and advance scientific frontiers. By allocating resources towards cutting-edge research initiatives, the institute aims to drive innovation, expand our understanding of the cosmos, and propel humanity towards new discoveries and achievements in space exploration. IIT Roorkee collaborates with ISRO (Indian Space Research Organisation) on various programs related to space science and technology. Two prominent programs are the CSST (Centre for Space Science and Technology) and STC (Space Technology Cell).

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International Collaboration:

Increased Space Budget and Space Education Curriculum:

- Industry Robotics Integration: for automation across various industries to enhance productivity, efficiency, and safety in sectors ranging from manufacturing and healthcare to logistics and agriculture.
- Ethics and Regulations: establishing ethical guidelines and regulations for the development and deployment of AI to safeguard against potential risks and societal impacts.
- AI in Education: IITR advocates for the implementation of AI driven personalized learning systems in educational institutions to enhance student engagement, achievement, and outcomes.
- Human-Robot Collaboration and robotics in Education: By fostering human robot collaboration, we enhance productivity, creativity, and safety in the workplace while promoting job satisfaction and wellbeing for workers.

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PDC List for the consideration of Senate

Appendix 'A'

Sl.No.	Name	Deptt.	Topic	Supervisor	Examiner (For./Ind.)	PDC Date
1.	Mr. Mahinder Bawaria	AR	PLANNING FOR OPTIMUM LAND USE FOR THE SAFE CITY ENVIRONMENT	Prof. Ram Sateesh Pasupuleti	Prof. Abraham George, IIT Kharagpur Prof. Subhajyoti Samaddar. Kyoto Univ., Japan Prof. Agatino Rizzo, Lulea Univ. of Tech., Sweden	13.09.23
2.	Mr. Manohare Manish Purushottam	AR	PSYCHOPHYSIOLOGY RESPONSE-BASED MODEL FOR HETEROGENEOUS TRAFFIC NOISE EXPOSURE	Prof. E. Rajasekar Prof. M. Parida	Prof. Sumana Gupta, IIT Kharagpur Prof. Brind Kumar, IIT (BHU) Varanasi	27.09.23
3.	Ms. Smita	AR	SUSTAINABLE WATER RESOURCE MANAGEMENT IN TIKAMGARH DISTRICT, MADHYA PRADESH	Prof. V. Devadas	Prof. P. B. S. Bhadoria, IIT Kharagpur Prof. Abdul Razak Mohamed, SPA Vijayawada	14.12.23
4.	Ms. Arshi Parashar	AR	INVESTIGATING FACTORS INFLUENCING WOMEN'S ENGAGEMENT WITH PUBLIC SPACES IN URBAN CONTEXT OF BHOPAL	Prof. Harshit Sosan Lakra	Prof. Ajay Khare, SPA, Bhopal Prof. Alpana Sivam, University of South Australia	12.02.24
5.	Mr. Atul Kumar	AR	GREEN INFRASTRUCTURE CHARACTERIZATION TO IMPROVE AIR QUALITY AND THERMAL ENVIRONMENT'	Prof. Mahua Mukherjee Prof. E. Rajasekar	Prof. Rajib SHAW, Keio University, Japan Prof. Claire Walsh, Newcastle University, UK	16.04.24
6.	Mr. Krishan Upadhyay	AR	DEVELOPMENT OF A THERMAL COMFORT INDEX FOR SEDENTARY WORK ENVIRONMENT	Prof. E. Rajasekar Prof. S. Subudhi	Prof. Himanshu Tyagi, IIT Ropar Prof. Srikonda Ramesh, SPA, Vijayawada	15.05.24
7.	Mr. Rakesh Kumar	B&B	STRUCTURAL AND FUNCTIONAL CHARACTERISATION OF THE JUVENILE HORMONE BIOSYNTHESIS PATHWAY ENZYME-FARNESOL DEHYDROGENASE FROM COTTON BOLLWORM HELICOVERPA ARMIGERA (HÜBNER)	Prof. A. K. Sharma	Prof. Amit Kumar Das, IIT Kharagpur Prof. Sanjib Senapati, IIT Madras Prof. Christian Betzel, Univ. of Hamburg, Germany	25.09.23
8.	Mr. Joy Das	B&B	MOLECULAR CHARACTERISATION AND FUNCTIONAL STUDIES ON CRUCIAL CHITIN BIOSYNTHESIS PATHWAY GENES FROM COTTON BOLLWORM HELICOVERPA ARMIGERA (HÜBNER)	Prof. A. K. Sharma	Prof. G. T. Behere, ICAR-Central Inst. for Cotton Res., Nagpur Prof. Keshav R. Kranthi, International Cotton Advsory Committee, Washington	25.09.23
9.	Mr. Niteesh Kumar Pandey	B&B	CHARACTERIZING DRUG RESISTANT BETA-LACTAMASES PRODUCED BY ISOLATEDBACTERIA FROM FIELD SAMPLES, TOWARDS THE UNDERSTANDING OF AMR AND DEVELOPMENT OF NOVEL DIAGNOSTICS	Prof. Saugata Hazra	Prof. Amit Kumar Das, IIT Kharagpur Prof. Samudrala Gourinath, JNU, New Delhi	03.11.23

Appendix 'D'
Item No. Senate / 101.16

14 JUN 2024

10.	Mr. Vivek Vijay Junghare	B&B	UNDERSTANDING PEPTIDE STRUCTURE-FUNCTION USING MODELLING, MD SIMULATION & AI	Prof. Saugata Hazra	Prof. Nitish R. Mahapatra, IIT Madras Prof. Amit Kumar Das, IIT Kharagpur	07.11.23
11.	Mr. Sourya Bhattacharya	B&B	UNDERSTANDING CLASS A BETA-LACTAMASE TOWARDS DRUG RESISTANCE	Prof. Saugata Hazra	Prof. Prasenjit Bhaumik, IIT Bombay Prof. Amit Kumar Das, IIT Kharagpur	08.11.23
12.	Mr. Ashwani Kumar	B&B	METABOLOMICS-BASED BIOACTIVITY ASSESSMENT OF PLUMBAGO ZEYLANICA	Prof. Debabrata Sircar	Prof. Mukesh Jain, JNU, New Delhi Prof. Shyam Kumar Masakapalli, IIT Mandi	10.11.23
13.	Mr. Sampath Kumar Banoth	B&B	TRANSCRIPTOMICS OF DEVELOPING MERISTEMS UNDER TERMINAL HEAT STRESS IN CONTRASTING CULTIVARS OF BARLEY (HORDEUM VULGARE L.	Prof. Harsh Chauhan	Prof. Bhupendra Chaudhary, JNU New Delhi Prof. Sotirios Fragkostefanakis, Goethe Univ. Frankfurt, Germany Prof. Chandan Sahi, IISER Bhopal	18.12.23
14.	Ms. Preeti Tomer	B&B	APPLICATIVE INSIGHTS TOWARDS PHAS DERIVED FROM WASTE RESOURCES	Prof. Saugata Hazra	Prof. Kaustubha Mohanty, IIT Guwahati Prof. Rintu Banerjee, IIT Kharagpur	27.12.23
15.	Mr. Shailendra Kumar	B&B	STUDIES ON THE INTERACTION OF FLAVONES WITH DIFFERENT DNA SEQUENCES AND THEIR STRUCTURAL ANALYSIS	Prof. Maya S. Nair	Prof. Ashutosh Kumar, IIT Bombay Prof. Heiko Ihmels, Univ. of Siegen, Germany	29.01.24
16.	Mr. Gireesh Kumar Shroti	B&B	PRODUCTION AND CHARACTERIZATION OF GREEN PLASTIC POLYMER POLYHYDROXYALKANOATES DERIVED FROM MICRO-ORGANISM USING WASTE RESOURCES	Prof. Saugata Hazra	Prof. Vikash Babu, CSIR-IIIM, Jammu Prof. Joydeep Mukherjee, Jadavpur Univ., Kolkata Prof. Nirupama Mallick, IIT Kharagpur	26.02.24
17.	Ms. Sapna Kewalrao Sunita Lonare	B&B	STUDIES ON IMPORTANT PROTEINS OF CANDIDATUS LIBERIBACTER ASIATICUS TOWARDS DEVELOPING POTENTIAL INHIBITOR MOLECULES	Prof. A. K. Sharma	Prof. Arvind M. Kayastha, BHU Varanasi Prof. J. Sivaraman, National University of Singapore	28.03.24
18.	Mr. PANKAJ CHANDLEY	B&B	ANALYSIS OF IMMUNE RESPONSES AGAINST CANDIDATE VIRULENCE ANTIGEN/S DURING MICROBIAL INFECTION	Prof. K. Mohan Poluri	Prof. Nadeem Khan, University of Florida USA Prof. Joshua Nosanchuk, Albert Einstein College of Medicine, US Prof. Manikandan Subramanian, University of London, UK	18.05.24
19.	Mr. Prateek Tripathi	CE	INTEGRATION OF NEAR-INFRARED, THERMAL, RAMAN SPECTROSCOPY AND HYPERSPECTRAL IMAGING FOR MINERAL CHARACTERIZATION : IMPLICATIONS FOR FUTURE LUNAR MISSIONS	Prof. R. D. Garg	Prof. Biswajeet Pradhan, University of Technology Sydney, Australia Prof. Alessandro Maturilli, Institute of Planetary Research, Berlin	21.07.23
20.	Ms. Neelam Gunjyal	CE	WASTEWATER RECEIVING PONDS IN RURAL INDIA AND THEIR IMPACT ON ANTIBIOTIC RESISTANCE AND GROUNDWATER QUALITY	Prof. Gargi Singh Prof. C. S. P. Ojha	Prof. Arvind Kumar Nema, IIT Delhi Prof. Thomas Boving, Univ. of Rhode Island, USA	03.08.23

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21.	Mr. Nejib Hassen Abdullahi	CE	MORPHOLOGICAL PROCESS AND FLOW CHARACTERISTICS IN A ALLUVIAL CHANNEL UNDER SEDIMENT MINING	Prof. Z. Ahmad	Prof. Deo Raj Kaushal, IIT Delhi Prof. Elena Pummer, Norwegian Univ. of Science & Technology, Norway	03.08.23
22.	Ms. Eshta Ranyal	CE	COMPUTER VISION BASED AUTOMATED CRACK AND POTHOLE DETECTION IN PAVEMENTS USING DEEP LEARNING	Prof. Kamal Jain	Prof. Michael Chapman, Toronto Metropolitan University, Canada Prof. Ayman F. Habib, Purdue University, USA	03.08.23
23.	Ms. Pinakshi Biswas	CE	FATE OF TRACE CONTAMINANTS IN RIVERS	Prof. Bhanu Prakash Vellanki	Prof. Ligy Philip, IIT Madras Prof. Dietrich Volmer, Humboldt University Berlin, Germany	03.08.23
24.	Mr. Lalit Pal	CE	ASSESSING NONSTATIONARITY IN PRECIPITATION AND ITS IMPACTS	Prof. C. S. P. Ojha Prof. Ajay Gairola	Prof. D. Nagesh Kumar, IISc Bangalore Prof. Prof. Ronny Berndtsson, Lund University, Sweden	08.09.23
25.	Mr. Sanjay Kumar Dewali	CE	AVALANCHE HAZARD MAPPING & MODELLING USING GEOMATICS TECHNIQUES	Prof. Kamal Jain	Prof. Gulab Singh, IIT Bombay Prof. Biswajeet Pradhan, University of Technology Sydney, Australia	20.09.23
26.	Mr. Abhijit Chakraborty	CE	NUMERICAL STUDY ON EMBANKMENTS RESTING ON LIQUEFIABLE SOIL WITH MITIGATION MEASURES	Prof. V. A. Sawant	Prof. G. R. Dodagoudar, IIT Madras Prof. Krishna R. Reddy, University of Illinois, USA	27.09.23
27.	Mr. Supriya Marik	CE	EVALUATION OF PAVEMENT PERFORMANCE RELATED PARAMETERS EMPLOYING SILICA BASED ADDITIVE COUPLING WITH ORDINARY PORTLAND CEMENT	Prof. G. D. Ransinchung R. N.	Prof. Arun Kumar, RMIT University, Australia Prof. Brind Kumar, IIT (BHU) Varanasi	06.10.23
28.	Mr. Ali Mubarack C. K.	CE	TRACK-BRIDGE INTERACTION IN PRESENCE OF CWR: STABILITY AS WELL AS STRENGTH ASPECTS	Prof. Akhil Upadhyay	Prof. Sriman K. Bhattacharyya, IIT Kharagpur Prof. Konjengbam Darunkumar Singh, IIT Guwahati	12.10.23
29.	Mr. Mayank Sharma	CE	MACHINE LEARNING BASED INFORMATION RETRIEVAL FROM LIDAR AND UAV DATASETS	Prof. R. D. Garg	Prof. Venkataraman Lakshmi, Univ. of Virginia, US Prof. Martin Kappas, Georg-August Unive. Goettingen, Germany	27.10.23
30.	Ms. Anita Bhatt	CE	PERFORMANCE BASED DESIGN OF RC MEMBERS SUBJECTED TO BLAST LOADING	Prof. Pradeep Bhargava Prof. Priti Maheshwari	Prof. Konjengbam Darunkumar Singh, IIT Guwahati Prof. Shobha K. Bhatia, Syracuse Univ., New York	01.11.23
31.	Ms. Kirtika Samanta	CE	ANALYSIS OF MACHINE FOUNDATIONS UNDER BLAST LOADING	Prof. Priti Maheshwari	Prof. Shobha K. Bhatia, Syracuse Univ., New York Prof. Subhadeep Banerjee, IIT Madras	03.11.23
32.	Mr. Mudragada Ravi Kumar	CE	DAMAGE ASSESSMENT OF RC FRAMES SUBJECTED TO BLAST AND POST-BLAST FIRE SCENARIOS	Prof. Pradeep Bhargava	Prof. Konjengbam Darunkumar Singh, IIT Guwahati Prof. Sasankasekhar Mandal, IIT (BHU) Varanasi	08.11.23
33.	Mr. Dinesh Kumar Samal	CE	STUDIES ON ITZ AND DAMAGE CHARACTERISTICS IN CONCRETE OF VARYING STRENGTHS: AN ANALYTICAL AND EXPERIMENTAL APPROACH	Prof. Sonalisa Ray Prof. H. Thiyagarajan	Prof. Ananth Ramaswamy, IISc Bangalore Prof. Jacqueline-Saliba, Universite de Bordeaux, France	13.11.23

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34.	Mr. Kamran	CE	STUDY OF HIGH RATE OF DEFORMATION OF PRESTRESSED CONCRETE SLABS	Prof. Mohd A. Iqbal	Prof. P. Venkitanarayanan, IIT Kanpur Prof. Chengging Wu, Univ. of Tech. Sydney-NSW, Australia	18.12.23
35.	Mr. Himanshu Bana	CE	DROUGHT ASSESSMENT USING EDI AND RAINFALL VARIABILITY WITH GIS TOOLS	Prof. R. D. Garg	Prof. Martin Kappas, Georg-August Unive. Goettingen, Germany Prof. Venkataraman Lakshmi, Univ. of Virginia, US	19.12.23
36.	Mr. Arshdeep Singh	CE	VALORISATION OF RICE HUSK ASH AS A SUPPLEMENTARY CEMENTITIOUS MATERIAL	Prof. Bhupinder Singh	Prof. Sudip Talukdar, IIT Guwahati Prof. Arezki Tagnit Hamou, Universite de Sherbrooke, Canada	27.12.23
37.	Mr. Bineet Kumar	CE	STUDIES ON FRACTURE PROCESSES IN CEMENTITIOUS COMPOSITE UNDER FATIGUE LOADING	Prof. Sonalisa Ray	Prof. J. M. Chandra Kishen, IISc Bangalore Prof. Konjengbam Darunkumar Singh, IIT Guwahati	05.01.24
38.	Mr. Rishi Singh Chhabra	CE	PERFORMANCE EVALUATION OF SUSTAINABLE RECYCLED BASE USING RAP MATERIAL	Prof. G. D. Ransinchung	Prof. Brind Kumar, IIT (BHU) Varanasi Prof. Arun Kumar, RMIT University, Australia Prof. Dharamveer Singh, IIT Bombay	05.01.24
39.	Mr. Tasgaonkar Pankaj Prakash	CE	VEHICLE TRACKING SYSTEM AND LOCATION BASED SERVICES USING REMOTE SENSING AND GIS	Prof. R. D. Garg Prof. P. K. Garg	Prof. A. K. Gosain, IIT Delhi Prof. Onkar Dikshit, IIT Kanpur	09.01.24
40.	Mr. Gurmesh	CE	DEVELOPMENT OF INERTACTIVE TRAVELLER INFORMATION SYSTEM	Prof. Praveen Kumar Prof. M. Parida	Prof. Arun Kumar, RMIT University, Australia Prof. Akhilesh Kumar Maurya, IIT Guwahati	11.01.24
41.	Mr. Ebissa Gadissa Kedir	CE	MODELLING FLOW IN PRISMATIC AND NON-PRISMATIC COMPOUND CHANNELS	Prof. K. S. Hari Prasad Prof. C. S. P. Ojha	Prof. Prashanth Reddy Hanmaiahgari, IIT Kharagpur Prof. J. H. Pu, University of Bradford, UK	19.01.24
42.	Ms. Manaswinee Kar	CE	PLANNING OF PARK-AND-RIDE FACILITIES AS FIRSTMILE CONNECTIVITY TO METRO STATIONS	Prof. M. Parida Prof. S. Sadhukhan Prof. Sanhita Das	Prof. Ashish Verma, IISc Bengaluru Prof. Manoj M., IIT Delhi	01.02.24
43.	Mr. Waibhaw Kumar	CE	FIRE PERFORMANCE OF STRUCTURAL STEEL TUBULAR COLUMNS WITH AND WITHOUT INFILLS	Prof. Umesh Kumar Sharma	Prof. Yogesh M. Desai, IIT Bombay Prof. Venkatesh Kodur, Michigan State University, USA	06.02.24
44.	Mr. Ananya Bijaya	CE	EXPLORATION OF FRACTURE ANISOTROPY, MULTISCALE MECHANICS AND DYNAMIC FRACTURE THROUGH PHASE-FIELD METHOD	Prof. Rajib Chowdhury Prof. Shubhankar Roy Chowdhury	Prof. Julien Yvonnet, Gustave Eiffel Univ., France Prof. Amirtham Rajagopal, IIT Hydrabad	28.02.24
45.	Mr. Chhaya Zalakkumar Rasendu	CE	ASEISMIC DESIGN SOLUTIONS FOR LIQUID STORAGE TANKS	Prof. Vipul Prakash	Prof. Hemant B. Kaushik, IIT Guwahati Prof. K. K. Pathak, IIT (BHU) Varanasi	20.03.24
46.	Mr. Saurabh Upadhyay	CE	MODELLING OF TRAFFIC NOISE FOR MID-BLOCK LOCATIONS IN URBAN AREAS	Prof. Praveen Kumar Prof. M. Parida Prof. Brind Kumar	Prof. Suresh Merugu, Univ. of Southampton Malaysia Prof. Arun Kumar, Queensland University of Tech., Australia	29.03.24
47.	Mr. Mohd Mohsin Khan	CE	DYNAMIC MATERIAL CHARACTERIZATION OF CONCRETE	Prof. Mohd. Ashraf Iqbal	Prof. P. Venkitanarayanan, IIT Kanpur Prof. N. K. Gupta, IIT Delhi	01.04.24

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48.	Mr. Ashish Walia	CE	DEVELOPMENT OF TEMPERATURE PREDICTION MODEL FOR FLEXIBLE PAVEMENTS	Prof. Rajat Rastogi Prof. Praveen Kumar Prof. S. S. Jain	Prof. Aravind Krishna Swamy, IIT Delhi Prof. Amit Bhasin, University of Texas, Austin	02.04.24
49.	Mr. B. Gowtham Balasundaram	CE	THERMAL HYDROLYSIS PRETREATMENT OF SEWAGE SLUDGE	Prof. A. A. Kazmi Dr. Vinay Kumar Tyagi	Prof. Makarand M. Ghangrekar, IIT Kharagpur Prof. Zhou Yan, Nanyang Tech. Univ., Singapore	12.04.24
50.	Mr. Sunni Kanta Prasad Kushwaha	CE	GEOSPATIAL ANALYSIS USING LIDAR IN FORESTRY AND UAV PHOTOGRAMMETRY IN URBAN REGIONS	Prof. Kamal Jain	Prof. Onkar Dikshit, IIT Kanpur Prof. Ram Avatar, Hokkaido University, Japan	17.04.24
51.	Mr. Adarsh Yadav	CE	TRAFFIC NOISE MODELLING AT URBAN INTERSECTON	Prof. M. Parida Prof. Pushpa Choudhary Prof. Brind Kumar	Prof. Khaled Shaaban, 800 W University Pkwy, MS 102 Prof. L. A. Kumaraswamidhas, IIT (ISM) Dhanbad	25.04.24
52.	Mr. Kavach Mishra	CE	CHARACTERIZATION OF IMPERVIOUS SURFACES USING HYPERSPECTRAL DATA AND MACHINE LEARNING TECHNIQUES	Prof. R. D. Garg	Prof. Andrea Garzelli, Univ. of Siena, Italy Prof. Kevin Tansey, University of Leicester, Leicester, UK	08.05.24
53.	Mr. Sandeep Kumar Dubey	CE	STUDIES ON CONCRETE FRACTURE BEHAVIOUR UNDER MONOTONIC AND FATIGUE LOADING: EFFECT OF HETEROGENEITY	Prof. Sonalisa Ray	Prof. J.M. Chandra Kishen, IISc Bangalore Prof. Prabir K. Kolay, Southern Illinois University, USA Prof. Sarat Kumar Panda, IIT Bhubaneswar	20.05.24
54.	Mr. Mukesh Kumar Meena	CH	ANALYTICAL PYROLYSIS FOR STRUCTURAL MODIFICATION AND THERMOCHEMICAL TRANSFORMATION OF LIGNOCELLULOSIC BIOMASS	Prof. Deepak Kumar Ojha	Prof. Ajay K. Dalai, Univ. of Saskatchewan, Canada Prof. Raman Singh, Monash University, Australia	13.11.23
55.	Ms. Priyanka	CH	IN SITU CATALYTIC (FE/CU/ZN) HYDROTHERMAL LIQUEFACTION OF WATER HYACINTH	Prof. N. S. M. Reddy	Prof. R. Vinu, IIT Madras Prof. Giridhar Madras, IIT Hyderabad Prof. Ajay K. Dalai, Univ. of Saskatchewan, Canada	21..11.23
56.	Mr. Saqib Jamshed	CH	HYDRODYNAMICS OF POROUS AND NON-POROUS CYLINDERS	Prof. Amit K. Dhiman	Prof. Arul Prakash K., IIT Madras Prof. Laszlo Baranyi, Univ. of Miskolc, Hungary	07.12.23
57.	Mr. Ravi Prakash	CH	EXPERIMENTAL AND NUMERICAL STUDY OF WALL WETTABILITY ON HYDRODYNAMICS OF LIQUID-LIQUID TWO-PHASE FLOW IN MINIATURE GEOMETRIES	Prof. Sumana Ghosh	Prof. Kirti Chandra Sahu, IIT Hyderabad Prof. Gautam Biswas, IIT Kanpur	12.12.23
58.	Mr. Naushad Khan	CH	EXTRACTIVE DESULFURIZATION OF LIQUID FUELS USING QUATERNARY AMMONIUM SALTS BASED DEEP EUTECTIC SOLVENTS	Prof. V. C. Srivastava	Prof. Jitendra Sangwai, IIT Madras Prof. Nishith Verma, IIT Kanpur	27.12.23
59.	Mr. Devendra Rai	CH	SYNTHESIS OF THIN-FILM ELECTRODES: APPLICATIONS IN WASTEWATER TREATMENT	Prof. Shishir Sinha	Prof. Ashutosh Tiwari, University of Utah, US Prof. Ravindra Gudi, IIT Bombay	28.03.24

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60.	Ms. Sneha Chauhan	CSE	ON CYBER SECURITY MODELS USING LAD	Prof. S. Gangopadhyay	Prof. M. V. Panduranga Rao, IIT Hyderabad Prof. Pantelimon Stanica, Naval Postgraduate School, USA	27.09.23
61.	Mr. Debraj Kundu	CSE	DESIGN AUTOMATION ISSUES AND THEIR SOLUTIONS FOR IMPLEMENTATION OF BIOPROTOCOLS USING ADVANCED MICROFLUIDIC BIOCHIPS	Prof. Sudip Roy	Prof. Rishad Shafik, Newcastle University, UK Prof. Indranil Sen Gupta, IIT Kharagpur	10.11.23
62.	Mr. Samarth Godara	CSE	A.I. APPROACHES FOR DECISION MAKING IN AGRICULTURAL APPLICATIONS	Prof. Durga Toshniwal	Prof. Robert Stahlbock, University of Hamburg, Germany Prof. Imre J. Rudas, Obuda University, Hungary	10.11.23
63.	Mr. Awaneesh Kumar Yadav	CSE	SECURE AND EFFICIENT AUTHENTICATION PROTOCOLS FOR NEXT GENERATION IoT AND MOBILE NETWORKS	Prof. Manoj Misra Prof. P. K. Pandey Prof. Madhusanka Liyanage	Prof. Pradeep Atrey, State University, New York Prof. Mohammad Shojafar, University of Surrey Prof. Michael Sheng, Macquarie Univ., Sydney	17.04.24
64.	Mr. Suyash Shukla	CSE	SIZE AND PRODUCTIVITY METRICS BASED EFFORT ESTIMATION FOR SOFTWARE DEVELOPMENT	Prof. Sandeep K. Garg	Prof. Pradeep Atrey, State University, New York Prof. Sanjay K. Singh, IIT (BHU) Varanasi	15.05.24
65.	Ms. Shaurya Mall	CT	ELECTRIC VEHICLE ADOPTION CHALLENGES AND CHARGING INFRASTRUCTURE PLANNING IN THE INDIAN URBAN ENVIRONMENT	Prof. A. Ramesh	Prof. S. G. Deshmukh, IIT Delhi Prof. Mark Goh, National University of Singapore	08.01.24
66.	Mr. Abdul Basit Khan	CT	EFFECTS OF DRIVING CHARACTERISTICS ON TRAFFIC SAFETY AND MANAGEMENT	Prof. Rajat Agarwal Prof. S. S. Jain	Prof. Akhilesh Kumar Maurya, IIT Guwahati Prof. Arun Kumar, Royal Institute of Tech., Australia	01.02.24
67.	Mr. T. Aromal	CT	A LEVEL OF SERVICE FRAMEWORK FOR AIRPORT PASSENGER TERMINAL BUILDINGS	Prof. E. Rajasekar Prof. B. R. Gurjar	Prof. Sharad Gokhale, IIT Guwahati Dr. Mukti Advani, CSIR-CRRI Delhi	05.04.24
68.	Ms. Jasasmita Das	CY	FABRICATION OF MIXED MATRIX MEMBRANE USING HETEROATOM-ENRICHED NANOPOROUS MATERIALS UTILIZED FOR ADSORPTIVE REMOVAL OF HG(II), PB(II), AND U(VI) IONS	Prof. Paritosh Mohanty	Prof. Sagar Pal, IIT (ISM) Dhanbad Prof. Kai Landskron, Lehigh University, USA	20.09.23
69.	Ms. Preeti Gahtori	CY	PROBING THE INFLUENCE OF SURFACE PROPERTIES OF NANOPARTICLES ON INTERFACIAL WATER AND LIPID MEMBRANES USING VSFG SPECTROSCOPY	Prof. Ravindra Pandey	Prof. Puspendu Kumar Das, IISc Bangalore Prof. Carlos R Baiz, Univ. of Texas at Austin, USA Prof. Manabendra Chandra, IIT Kanpur	27.09.23
70.	Mr. Sain Singh	CY	STUDIES ON DESIGNED RUTHENIUM COMPLEXES AND THEIR REACTIVITIES	Prof. Kaushik Ghosh	Prof. Anil J. Elias, IIT Delhi Prof. Pradip Mascharak, Univ. of California, US	09.10.23
71.	Ms. Atika	CY	POROUS ACTIVATED CARBON AND NICKEL HYDROXIDE AS ELECTRODES FOR SYMMETRIC AND HYBRID SUPERCAPACITOR DEVICES	Prof. R. K. Dutta	Prof. Bhabani K. Satapathy, IIT Delhi Prof. Raghunath Acharya, BARC Mumbai	20.11.23

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72.	Mr. Anuj Rawat	CY	ADSORPTIVE DESULPHURIZATION OF FUELS BY POLYCYCLIC AROMATIC HYDROCARBONS DERIVED NANOPOROUS POLYMERS	Prof. Paritosh Mohanty	Prof. Bishnupada Mandal, IIT Guwahati Prof. Ajay Mandal, IIT (ISM) Dhanbad	21.11.23
73.	Mr. Vikrant Chaudhary	CY	PRESSURE EFFECT ON SPIN, ELECTRONIC, AND THERMAL TRANSPORT IN TERNARY INTERMETALLICS	Prof. Hem C. Kandpal	Prof. Abhishek Kumar Singh, IISc Bangalore Prof. Arghya Taraphder, IIT Kharagpur	13.12.23
74.	Mr. Anupam Das	CY	PHOTOINDUCED ORGANIC TRANSFORMATIONS OF OLEFINS AND CARBONYL COMPOUNDS	Prof. K. R. Justin Thomas	Prof. K. R. Prabhu, IISc Bangalore Prof. G. Gekar, IIT Madress	05.03.24
75.	Mr. Ikrar Ahmad	CY	IN SITU SYNTHESIS OF HETEROATOM(S) (N/S/P) CODOPED POROUS REDUCED GRAPHENE OXIDE AS ELECTRODE MATERIAL(S) FOR DESIGNING OF BINDERFREE AND HIGH-MASS LOADED SUSTAINABLE HIGH PERFORMANCE AQUEOUS SYMMETRIC SUPERCAPACITOR AND ELECTROCHEMICAL SENSOR	Prof. Anil Kumar	Prof. Detlef Bahnemann, Saint-Petersburg State University, Russia Prof. Prem Chandra Pandey, IIT (BHU), Varanasi	15.03.24
76.	Mr. Motahar SK	CY	NON-PRECIOUS METAL-CATALYZED (DE)HYDROGENATION OF ALCOHOLS: SYNTHESIS OF OLEFINS, N-HETEROARENES AND 1,5-DIKETONES	Prof. Debasis Banerjee	Prof. N. G. Ramesh, IIT Delhi Prof. Louis FENSTERBANK, Sorbonne Université, France	15.03.24
77.	Ms. Shivani Chauhan	DMM	PARTICIPATORY RISK RESILIENT PLANNING FRAMEWORK FOR SUSTAINABLE HILL HABITAT	Prof. Mahua Mukherjee	Prof. Rajib SHAW, Keio University, Japan Prof. Chandan Ghosh, Ministry of Home Affairs, Delhi	20.02.24
78.	Mr. Sandeep Gairola	DMM	DEVELOPMENT AND FLAMMABILITY BEHAVIOR OF FOREST/CROP RESIDUE-BASED POLYMERIC COMPOSITES	Prof. Inderdeep Singh Prof. Shishir Sinha	Prof. Debabrata Chakraborty, IIT Guwahati Prof. Naresh Bhatnagar, IIT Delhi	12.03.24
79.	Mr. Saragada Prasanna Kumar	ECE	DESIGN AND ANALYSIS OF ENERGY-EFFICIENT SRAMBASED ON-CHIP IN-MEMORY COMPUTATION FOR MACHINE LEARNING APPLICATIONS	Prof. Bishnu Prasad Das	Prof. Gaurab Banerjee, IISc Bangalore Prof. Tony Kim Tae Hyoung, NTU, Singapore	07.11.23
80.	Mr. Bivalkar Mandar Kisan	ECE	DEVELOPMENT OF SIGNAL ENHANCEMENT TECHNIQUES FOR TARGET DETECTION WITH MICROWAVE/ MILLIMETER WAVE IMAGING SYSTEMS	Prof. Dharmendra Singh	Prof. S. N. Merchant, IIT Bombay Prof. Yoshio Yamaguchi, Niigata University, Japan	10.11.23
81.	Ms. Namiita	ECE	NTIFERROMAGNETIC SKYRMION BASED ENERGY-EFFICIENT NEURON DEVICES	Prof. B. K. Kaushik	Prof. Supriyo Bandyopadhyay, Virginia Commonwealth Univ., USA Prof. M. M. De Souza, Univ. of Sheffield, UK	30.11.23

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82.	Ms. Surbhi Adya	ECE	INVESTIGATIONS ON SECOND HARMONIC GYROTRONS	Prof. Meenakshi Rawat Prof. M. V. Kartikeyan	Prof. Alan David Reginald Phelps, University of Strathclyde, UK Prof. Francisco Falcone, Univ. of Johannesburg, South Africa Prof. M. Jaleel Akhtar, IIT Kanpur	30.11.23
83.	Mr. Vivek Kumar	ECE	MODELING AND ANALYSIS OF SELF-HEATING EFFECT IN ADVANCED MULTI-GATE MOSFETS	Prof. Arnab Dutta Prof. Sudeb Dasgupta	Prof. Vihar Georgiev, University of Glasgow, UK Prof. Abhisek Dixit, IIT Delhi	19.12.23
84.	Mr. Jaydeep Singh	ECE	DEVELOPMENT OF EM BASED TECHNIQUES WITH MACHINE LEARNING FOR DESIGNING THE MICROWAVE STRUCTURES	Prof. Dharmendra Singh	Prof. A. R. Harish, IIT Kanpur Prof. K. P. Singh, IIT (BHU) Varanasi	19.12.23
85.	Mr. Debashish Mondal	ECE	INVESTIGATIONS ON HIGH-POWER SUB-TERAHERTZ GYROTRONS	Prof. Meenakshi Rawat Prof. M. V. Kartikeyan	Prof. Claudio Paoloni, Lancaster University, UK Prof. Gun-sik Park, Seoul National Univ. Republic of Korea	29.01.24
86.	Ms. Priya Gupta	ECE	THROUGHPUT ENHANCEMENT USING RESOURCE ALLOCATION AND MASSIVE MIMO TECHNOLOGY IN CELLULAR SYSTEM	Prof. Debashis Ghosh	Prof. Eduard Jorswieck, Institute for Comm. Tech., Technische Univ. Braunschweig, Germany Prof. Srikrishna Bhashyam, IIT Madras	06.02.24
87.	Ms. Aradhya Saini	ECE	DEVELOPMENT OF COMPUTER VISION APPROACH FOR RAILROAD TRACK HEALTH/ASSETS MONITORING WITH DRONE DATA	Prof. Dharmendra Singh	Prof. H. Yahia, INRIA Bordeaux Sud-Ouest, France Prof. Sanjay K. Singh, IIT (BHU) Varanasi	30.04.24
88.	Mr. Khoirom Johnson Singh	ECE	NEGATIVE CAPACITANCE EFFECTS IN MULTIDOMAIN FERROELECTRIC DEVICES FOR LOW VOLTAGE APPLICATIONS	Prof. Sudeb Dasgupta Prof. Anand Bulusu	Prof. Pierpaolo Palestri, University of Modena and Reggio-Emilia Prof. Fabrizio Bonani, Politecnico di Torino, Italy	06.05.24
89.	Mr. Diress Tilahun Antalem	EE	INVESTIGATION ON DC/AC MICROGRID STABILITY FOR INPUT SOURCE DISTURBANCE	Prof. Avik Bhattacharya	Prof. Sukumar Mishra, IIT Delhi Prof. Dipti Srinivasan, National Univ. of Singapore	05.09.23
90.	Mr. Soju Joseph Alexander	EE	AN EMBEDDED PZT-BASED TRANSDUCER FOR MONITORING CURING OF CEMENTITIOUS MATERIALS IN STRUCTURES	Prof. P. Sumathi Prof. S. K. Panigrahi	Prof. Boby George, IIT Madras Prof. Bishwajit Bhattacharjee, IIT Delhi Prof. S. C. Mukhopadhyay, Macquarie Unive. NSW, Australia	20.09.23
91.	Ms. Satabdy Jena	EE	NETWORKED CONTROL AND OPERATION OF CYBER PHYSICAL DC / AC MICROGRIDS	Prof. N. P. Padhy	Prof. Suresh Chandra Srivastava, IIT Kanpur Prof. K. Shanti Swarup, IIT Madras	03.11.23
92.	Mr. Suresh Maganti	EE	DISTRIBUTED GENERATION FOR IMPROVING THE VOLTAGE PROFILE OF A WEAK GRID	Prof. N. P. Padhy	Prof. K. Shanti Swarup, IIT Madras Prof. Suresh Chandra Srivastava, IIT Kanpur	03.11.23
93.	Mr. P. Naveen	EE	OPTIMAL COORDINATION OF OVERCURRENT RELAYS FOR ENHANCED PROTECTION IN AC MICROGRIDS	Prof. Premalata Jena	Prof. A. K. Pradhan, IIT Kharagpur Prof. Trapti Jain, IIT Indore	11.01.24

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94.	Mr. Kamal Raj Singh	EE	CARDIAC MRI SEGMENTATION USING DEEP LEARNING"	Prof. Ambalika Sharma Prof. G. K. Singh	Prof. Dinesh Kumar, RMIT University, Australia Prof. Vikram M. Gadre, IIT Bombay	12.02.24
95.	Mr. Nitesh Kumar	EE	INVESTIGATIONS OF SOLID STATE TRANSFORMERS FOR MICROGRID APPLICATIONS	Prof. Pramod Agarwal	Prof. Prasad Enjeti, Texas A&M Univ., USA Prof. Geza Joos, University. Street Montreal Quebec, Canada	12.02.24
96.	Mr. Chetan Srivastava	EE	NOVEL AND EFFICIENT PROTECTION SCHEMES FOR LOW VOLTAGE DC MICROGRID	Prof. Manoj Tripathy	Prof. Lie Xu, University of Strathclyde, UK Prof. A. K. Pradhan, IIT Kharagpur	22.04.24
97.	Mr. Gade Kesava Rao	EE	FAULT DETECTION AND LOCALIZATION SCHEMES FOR DC MICROGRID NETWORK	Prof. Premalata Jena	Prof. A. K. Pradhan, IIT Kharagpur Prof. Iqbal Husain, North Carolina State University, USA	26.02.24
98.	Mr. Narendra Babu Y.	EE	HARMONIC INSTABILITY ASSESSMENT AND RESONANCE INVESTIGATION OF GRID-TIED INVERTER SYSTEM	Prof. N. P. Padhy	Prof. Suryanarayana Doolla, IIT Bombay Prof. Subhransu Ranjan Samantaray, IIT Bhubaneswar	29.02.24
99.	Ms. Kartika Dubey	EE	PROTECTION AND SECURITY ENHANCEMENT OF ACTIVE AC DISTRIBUTION SYSTEM USING DIFFERENTIAL TECHNIQUES	Prof. Premalata Jena	Prof. Ashok Kumar Pradhan, IIT Kharagpur Prof. Vijay K. Sood, Ontario Tech. Univ., Canada	28.03.24
100.	Mr. Himesh Kumar	EE	LOSS ALLOCATION IN DISTRIBUTION NETWORK WITH DISTRIBUTED GENERATION	Prof. D. K. Khatod	Prof. Anil Pahwa, Kansas State Univ., US Prof. Debapriya Das, IIT Kharagpur	09.04.24
101.	Mr. Rudranarayan Pradhan	EE	DEVELOPMENT OF NOVEL FAULT DETECTION AND DIRECTION ESTIMATION SCHEMES FOR AC MICROGRID	Prof. Premalata Jena	Prof. Surendra Reddy Salkuti, Woosong University, Republic of Korea Prof Chandrashekhar N Bhende, Bhubaneswar	03.05.24
102.	Ms. Bhabani Kumari Choudhury	EE	DEVELOPMENT OF NOVEL PROTECTION SCHEMES FOR DC MICROGRIDS	Prof. Premalata Jena	Prof. A. K. Pradhan, IIT Kharagpur Prof. Bidyadhar Subudhi, IIT Goa	09.05.24
103.	Mr. Abhishek Kumar	EE	INTER-TURN FAULT LOCALIZATION IN TRANSFORMER WINDING BY ANALYZING FREQUENCY REGIONS OF SFRA	Prof. Bhavesh R. Bhalja Prof. Ganesh B. Kumbhar	Prof. S. V. Kulkarni, IIT Bombay Prof. C. C. Reddy, IIT Ropar	10.05.24
104.	Mr. Desai Aniket Sanjay	EQ	ROLE OF A-PRIORI INFORMATION IN MINIMIZING UNCERTAINTIES IN MASW TESTING AND SUBSEQUENT SITE RESPONSE ANALYSIS	Prof. Ravi S. Jakka	Prof. Deepankar Choudhury, IIT Bombay Prof. Adrian Rodriguez-Marek, Virginia Polytechnic Institute & State University, USA Prof. K. S. Rao, IIT Delhi	07.11.23
105.	Mr. Palyam Gautham Reddy	EQ	SEISMIC PERFORMANCE EVALUATION OF CONCRETE GRAVITY DAMS	Prof. Manish Shrikhande	Prof. Amlan Kumar Sengupta, IIT Madras Prof. Ahmed Ghobarah, McMaster University, Canada	23.11.23
106.	Mr. Patankar Digvijay Babasaheb	EQ	DESIGN CONSIDERATIONS OF FRICTION DAMPER FOR SEISMIC RESPONSE REDUCTION IN FRAMED BUILDINGS	Prof. Manish Shrikhande	Prof. Durgesh C. Rai, IIT Kanpur Prof. Arghya Deb, IIT Kharagpur	27.12.23

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107.	Mr. Mayank Sharma	EQ	EFFECT OF URM INFILLS ON SEISMIC PERFORMANCE OF RC FRAME AND FRAME-SHEAR WALL BUILDINGS	Prof. Yogendra Singh Prof. Henry V. Burton	Prof. Solomon Tesfamariam, P. Univ. of Waterloo, Canada Prof. Vasant Matsagar, IIT Delhi Prof. Sajal K. Deb, IIT Guwahati	21.03.24
108.	Mr. C. Lallawmawma	EQ	SEISMIC HAZARD AND RISK ASSESSMENT OF NORTHEAST INDIAN REGION-A PROBABILISTIC APPROACH	Prof. M. L. Sharma Prof. J. Das	Prof. P. Anbazhagan, IISc Bangalore Prof. Sanjit Kumar Pal, IIT (ISM) Dhanbad	15.05.24
109.	Mr. Cyril Shaju	ES	A FRACTAL APPROACH TO TIME SERIES ANALYSIS WITH EMPHASIS ON INDIAN PLATE SEISMICITY	Prof. Kamal	Prof. Paresh Nath Singha Roy, IIT Kharagpur Prof. Ramesh P. Singh, Chapman University, USA	03.08.23
110.	Mr. Ravi Yadav	ES	MICROBIOTA FROM DECCAN INTERTRAPPEAN DEPOSITS OF THE WESTERN (KUTCH) AND CENTRAL (MADHYA PRADESH) PENINSULAR INDIA	Prof. A. S. Maurya Prof. Sunil Bajpai	Prof. Ajoy Kumar Bhaumik, IIT (ISM) Dhanbad Prof. Georgios Georgalis, Polish Acad. of Sci., Poland	21.10.23
111.	Mr. Mohd. Usman Khan	ES	SPATIAL DISTRIBUTION, GEOCHEMICAL BEHAVIOUR AND MOBILZATION MECHANISMS OF ARSENIC IN THE AQUIFERS OF UPPER AND MIDDLE GANGETIC PLAINS, INDIA	Prof. Nachiketa Rai	Prof. Dan Lapworth, British Geological Survey, UK Prof. Ashima Saikia, University of Delhi, Delhi	13.11.23
112.	Soumya Darshan Panda	ES	STABILITY ASSESSMENT OF KOTROPI LANDSLIDE USING NUMERICAL MODELING AND ESTABLISHMENT OF REGIONAL RAINFALL THRESHOLD, HIMACHAL PRADESH, INDIA	Prof. S. P. Pradhan	Prof. T. N. Singh, IIT Patna Prof. Kripamoy Sarkar, IIT (ISM) Dhanbad Prof. Vikram Vishal, IIT Bombay	14.12.23
113.	Mr. Dinesh Kumar	ES	RESERVOIR CHARACTERISATION AND SOURCE ROCK STUDIES OF MESOZOIC AND TERTIARY SEQUENCES, JAISALMER BASIN, RAJASTHAN	Prof. A. S. Maurya Prof. Ravi Sharma	Prof. Soumyajit Mukherjee, IIT Bombay Prof. Santanu Banerjee IIT Mumbai	07.02.24
114.	Ms. Nongmaithem Menaka Chanu	ES	3D TOMOGRAPHIC MODELLING FOR NE INDIA USING SURFACE WAVES	Prof. S. Mukhopadhyay Dr. Naresh Kumar	Prof. Surya Pachhai, University of UTAH, USA Prof. Luca De Siena, Johannes Gutenberg University, Germany	04.03.24
115.	Mr. Tanveer Ali Dar	ES	CHARACTERIZATION OF SURFACE WATER-GROUNDWATER INTERACTIONS IN THE UPPER JHELUM BASIN, HIMALAYAS, USING AN INTEGRATED GEOCHEMICAL, ISOTOPIC, AND MODELING APPROACH	Prof. Nachiketa Rai Dr. Sudhir Kumar	Prof. Alan E. Fryar, University of Kentucky, USA Prof. Syed Hilal Farooq, IIT Bhubaneswer	21.03.24

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116.	Mr. Dhanesh Kumar Phaye	ES	UNCONVENTIONAL HYDROCARBON POTENTIAL OF CAMBAY SHALE, JAMBUSAR-BROACH AREA, CAMBAY BASIN, INDIA: IMPLICATION ON SEQUENCE STRATIGRAPHY	Prof. Biplab Bhattacharya	Prof. Raj Kumar Singh, IIT Bhubaneswer Prof. Atul Kumar Verma, IIT (ISM) Dhanbad	05.04.24
117.	Ms. Pipasa Layak	ES	ACCRETION AND THERMO-CHEMICAL EVOLUTION OF TERRESTRIAL PLANETARY BODIES	Prof. Nachiketa Rai	Prof. Debajyoti Paul, IIT Kanpur Prof. Jamie Gilmour, Univ. of Manchester, UK Prof. Mathieu Roskosz, MNSN, France	25.04.24
118.	Mr. Ankit Gupta	ES	TECTONIC GEOMORPHOLOGY AND SEDIMENTOLOGY IN PARTS OF THE GANGA-GHAGHARA INTERFLUVE	Prof. Pradeep Srivastava	Prof. Jayant K. Tripathi, JNU Delhi Prof. Javed N. Malik, IIT Kanpur	15.05.24
119.	Mr. Dixitkumar Prafulkumar Pathak	HRD	DEVELOPMENT OF INTEGRATED RENEWABLE ENERGY SYSTEM FOR AN UN-ELECTRIFIED REMOTE AREA	Prof. D. K. Khatod	Prof. Devender Singh, IIT (BHU) Varanasi Prof. Prabodh Bajpai, IIT Kanpur	29.11.23
120.	Mr. Sandeep Kumar	HRD	STUDIES ON PRODUCTION AND UTILISATION OF BIODIESEL FROM MIXED OILS	Prof. M. K. Singhal Prof. M. P. Sharma	Prof. Hifjur Raheman, IIT Kharagpur Prof. Devendra Deshmukh, IIT Indore	06.12.23
121.	Mr. Ramjee Lal Meena	HRD	DEVELOPMENT OF CONTROL STRATEGIES FOR DC MICROGRID	Prof. Avik Bhattacharya Prof. D. K. Khatod	Prof. Dipti Srinivasan, National Univ. of Singapore Prof. Bharat Singh Rajpurohit, IIT Jodhpur	22.04.24
122.	Mr. Naman Arora	HRD	ASSESSMENT OF SEDIMENT ABRASIVE POTENTIAL IN HIMALAYAN RIVERS	Prof. Arun Kumar Prof. Sunil K. Singal	Prof. Mohammad Saud Afzal, IIT Kharagpur Prof. Jaan Pu, University of Bradford, UK	26.04.24
123.	Mr. Surya Prakash Verma	HSS	EXPLORATION OF CHARLIE CHAPLIN'S THE LITTLE TRAMP SCREENPERSONA IN SELECT FILMS: A POSTSCRIPT TO THE MYTH OF SISYPHUS	Prof. Binod Mishra	Prof. Aysha Iqbal, IIT Madras Prof. Maya Shanker Pandey, BHU, Varanasi	03.08.23
124.	Ms. Simegn Birhan Tessema	HSS	ECONOMIC VALUATION OF FOREST ECOSYSTEM SERVICES UNDER PARTICIPATORY MANAGEMENT IN ETHIOPIA	Prof. Diptimayee Nayak	Prof. Vrajaindra Upadhyay, IIT Delhi Prof. K. Narayanan, IIT Bombay	25.09.23
125.	Mr. Riyaz Alam	HSS	ASSESSMENT OF ECOTOURISM IN PROTECTED AREAS: A STUDY OF JIM CORBETT TIGER RESERVE, INDIA	Prof. Diptimayee Nayak	Prof. Benjamin Burkhard, Leibniz University Hannover, Germany Prof. Narayan C. Nayak, IIT Kharagpur	06.10.23
126.	Mr. Manzoor Ahmad Malik	HSS	ESSAYS ON DEMOGRAPHIC DYNAMICS, AGEING, AND ECONOMIC GROWTH	Prof. S. P. Singh Prof. Falguni Pattanaik	Prof. Shivalingappa Sangappa Halli, Univer. of Manitoba, Canada Prof. Udaya Shankar Mishra, International Institute for Population Sci., Mumbai	06.10.23
127.	Mr. Athaley Vaibhao Govindrao	HSS	A STUDY OF INCLUSIVE PRACTICES AND EDUCATION TECHNOLOGY FOR DEAF STUDENTS OF ART AND DESIGN HIGHER EDUCATION IN INDIA	Prof. A. J. Mishra	Prof. Deepak Joshi, IIT Delhi Prof. Prof. Olga V. Galustyan, Southern Federal University, Russia	27.12.23

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128.	Ms. Richa	HSS	CLIMATE-CHANGE INDUCED MIGRATION: AN EVIDENCE-BASED STUDY IN THE SELECTED DISTRICTS OF NORTH BIHAR	Prof. Subir Sen	Prof. Jack Dewaard, Population Council, Washington, USA Prof. Tuhin Ghosh, Jadavpur Unive., Kolkata	02.01.24
129.	Ms. Purba Chakraborty	HSS	RECLAIMING SPACE IN AREAS OF CONFLICT: A SELECT READING OF JOE SACCO AND SARAH GLIDDEN	Prof. Rashmi Gaur	Prof. Rajni Singh, IIT (ISM) Dhanbad Prof. Alessandro Vescovi, Universita, Culture E Mediazioni, Italy	01.02.24
130.	Ms. Nobonita Rakshit	HSS	ENVIRONMENTAL CRISIS AND POSTCOLONIAL SOUTH ASIA: AN ECO-AESTHETIC READING OF CONTEMPORARY SOUTH ASIAN NOVELS	Prof. Rashmi Gaur	Prof. Rajesh Kumar, IIT Madras Prof. Rajni Singh, IIT (ISM) Dhanbad	26.02.24
131.	Mr. Divyanshu Kumar Dixit	HSS	PERI-URBANISATION, LAND-USE DYNAMICS AN LIVELIHOOD DIVERSIFICATION IN URBAN FRINGE OF AGARA AND VARANASI CITIES	Prof. S.P. Singh	Prof. Ram Sakal Yadav, BHU, Varanasi Prof. Nalib Bharti, IIT Patna	28.02.24
132.	Ms. Priya	HSS	ASSESSMENT OF AGRICULTURAL SUSTAINABILITY IN PUNJAB: FACTORS AND FARMERS' PERSPECTIVE	Prof. Sukhpal Singh	Prof. Dukhbandhu Sahoo, IIT Bhubaneswar Prof. Pritee Sharma, IIT Indore Dr. Shiv Kumar, ICAR-NIAEPRP, New Delhi	06.05.24
133.	Mr. Guntu Ravikumar	HY	INVESTIGATION OF CHARACTERISTICS, DRIVERS, AND PREDICTABILITY OF COMPOUND DRY AND HOT EXTREMES	Prof. Ankit Agarwal	Prof. R. Krishnan, IITM, Pune Prof. Nicola Fohrer, Univ. of Kiel, Germany	30.11.23
134.	Mr. Tegegn Kassa Beyene	HY	HYDROLOGICAL DROUGHT PROPAGATION AND VULNERABILITY IN ETHIOPIA	Prof. Manoj K. Jain Prof. B. K. Yadav Prof. Ankit Agarwal	Prof. Bellie Sivakumar, IIT Bombay Prof. Srinivasulu Ale, Texas A&M AgriLife Research, USA	01.12.23
135.	Ms. Sana Dhamija	HY	GEOSTATISTICAL MODELLING, PLANT UPTAKE AND HUMAN HEALTH RISK ASSESSMENT OF ARSENIC IN GANGA BASIN, INDIA	Prof. Himanshu Joshi	Prof. Abhijit Mukherjee, IIT Kharagpur Prof. David Polya, The Univ. of Manchester, UK Prof. Stefan Krause, University of Birmingham, UK	15.05.24
136.	Mr. Rouchin Mahendra	IIC	SYNTHESIS & STUDY OF METAL DIELECTRIC THIN FILMS FOR OPTICAL COMPONENTS AND DEVICES	Prof. Ramesh Chandra	Prof. Mahesh Kumar, IIT Jodhpur Prof. Parinda Vasa, IIT Bombay	03.11.23
137.	Mr. K. Sunil Behal	MA	PROPAGATION OF COMPUTER VIRUS AND PATCH DISSEMINATION	Prof. Tanuja Srivastava Prof. Sunita Gakkhar	Prof. Nitu Kumari, IIT Mandi Prof. A. K. Misra, BHU Varanasi	08.09.23
138.	Mr. Mashkoor Ali	MA	MATHEMATICAL THEORY ON THE DISCRETE COLLISION-INDUCED BREAKAGE EQUATIONS AND THE SAFRONOV-DUBVOSKII COAGULATION EQUATIONS	Prof. Ankik Kumar Giri	Prof. Sunil Kumar, IIT (BHU) Varanasi Prof. Volker John, WIAAS Germany	06.10.23
139.	Ms. Preeti	MA	CLASSIFICATION AND CLUSTERING PROBLEMS IN MACHINE LEARNING ASSISTED BY METAHEURISTIC ALGORITHMS	Prof. Kusum Deep	Prof. Kapil Ahuja, IIT Indore Prof. Amitava Chatterjee, Jadavpur Univ., Kolkata	12.10.23

140.	Ms. Ashishi Puri	MA	COMPUTATIONAL ALGORITHMS FOR RECONSTRUCTION OF CROSSING WHITE MATTER FIBERS IN BRAIN	Prof. Sanjeev Kumar	Prof. Swaroop Nandan Bora, IIT Guwahati Prof. Sarvesh Kumar, IISST Trivandrum	17.10.23
141.	Mr. Sibasish Dhibar	MA	COST OPTIMIZATION AND JOINING STRATEGIES FOR MARKOVIAN QUEUES	Prof. Madhu Jain	Prof. U. C. Gupta, IIT Kharagpur Prof. Kuo-Hsiung Wang, Asis University, Taiwan	27.10.23
142.	Mr. Ashish Kumar	MA	EXISTENCE, UNIQUENESS AND CONTROLLABILITY RESULTS FOR SOME FRACTIONAL ORDER DIFFERENTIAL EQUATIONS	Prof. D. N. Pandey	Prof. Michal Feckan, Comenius University in Bratislaava, Slovaka Prof. Swaroop Nandan Bora, IIT Guwahati	01.11.23
143.	Ms. Anjali Sonkariya	MA	DEVELOPMENT OF SOME INTUITIONISTIC FUZZY DEA MODELS AND THEIR APPLICATIONS TO POLICE, BANKING AND EDUCATION SECTORS	Prof. S. P. Yadav	Prof. Pankaj Dutta, IIT Bombay Prof. S. P. Tiwari, IIT (ISM) Dhanbad	22.11.23
144.	Ms. Uganta Yadav	MA	MATHEMATICAL MODELS FOR HARVESTING OF NATURAL RESOURCES	Prof. Ameeya K. Nayak Prof. Sunita Gakkhar	Prof. Joydev Chattopadhyay, ISI Kolkata Prof. Nitu Kumari, IIT Mandi	30.11.23
145.	Mr. Kush Kinra	MA	RANDOM DYNAMICS OF CONVECTIVE BRINKMANFORCHHEIMER EQUATIONS	Prof. Manil T. Mohan	Prof. Peter Kloeden, Universitat Tubingen, Germany Prof. Zdzislaw Brzezniak, University of York, UK	01.12.23
146.	Ms. Lavina Sahijwani	MA	CONTROLLABILITY AND COMPUTATION OF CONTROL FOR INFINITE DIMENSIONAL FRACTIONAL DIFFERENTIAL SYSTEMS	Prof. N. Sukavanam	Prof. Dhirendra Bahuguna, IIT Kanpur Prof. Chee Peng Lim, Deakin University, Australia	01.12.23
147.	Ms. Sapna	MA	NUMERICAL SIMULATION OF FLUID FLOW, HEAT AND MASS TRANSFER OF POWER-LAW NANOFLUID USING HYBRID APPROACH	Prof. Pratibha Prof. Rama Bhargava	Prof. Ankur Jain, Univ. of Texas at Arlington, USA Prof. Arvind Kumar Gupta, IIT Ropar	14.12.23
148.	Ms. Arpita Mondal	MA	MODELLING THE DYNAMICS OF MARINE ECOSYSTEM USING MOMENT CLOSURE METHOD	Prof. Sandip Banerjee	Prof. Siddhartha Pratim Chakrabarty, IIT Guwahati Prof. R. K. Upadhyay, IIT (ISM) Dhanbad	19.12.23
149.	Mr. Prince	MA	DESIGN AND DEVELOPMENT OF NEW VARIANTS OF SALP SWARM ALGORITHM FOR ENERGY RELATED OPTIMIZATION PROBLEMS	Prof. Kusum Deep	Prof. Akshaya Kumar Ojha, IIT Bhubaneswar Prof. Atulya K. Nagar, Liverpool Hope Univ., UK	29.01.24
150.	Ms. Palak	MA	PERFORMANCE ANALYSIS OF STATE DEPENDENT MARKOVIAN QUEUEUS WITH RETRIAL ORBIT	Prof. Madhu Jain	Prof. Umesh Chandra Gupta, IIT Kharagpur Prof. Ajit K. Verma, Western Norway University	02.04.24
151.	Ms. Surbhi Rani	MA	COMPLEX DYNAMIC BEHAVIOR IN SOME NON-LINEAR CONTINUOUS SYSTEMS	Prof. Sunita Gakkhar Prof. A. K. Nayak	Prof. Arvind Kumar Gupta, IIT Ropar Prof. Nitu Kumari, IIT Mandi	30.04.24
152.	Mr. Mohan	MA	SOME GENERALIZATIONS OF SUMSETS AND THEIR ASSOCIATED DIRECT AND INVERSE PROBLEMS	Prof. R. K. Pandey	Prof. Georges Grekos, Institute Camille Jordan, France Prof. Rupam Burman, IIT Guwahati	30.04.24

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153.	Mr. Vrinda Dhingra	MA	DEVELOPING AND ANALYZING STRATEGIES FOR OPTIMAL SPARSE PORTFOLIO SELECTION	Prof. Shiv Kumar Gupta	Prof. Pankaj Dutta, IIT Bombay Manuel Arana-Jimenez, University of Cadiz Prof. Suresh Chandra, IIT Delhi	09.05.24
154.	Ms. Surabhi Nishad	MA	HYBRID MESHFREE IMPLEMENTATION TO SOME PROBLEMS OF FLOW AND HEAT TRANSFER IN NANOFLUIDS	Prof. A. K. Nayak Prof. Rama Bhargava	Prof. André Revil, Université Savoie Mont-Blanc EDYTEM CNRS UMR 5204, France Prof. P V S N Murthy, IIT Kharagpur	09.05.24
155.	Mr. Mayank	MA	STOCHASTIC MODELING AND PERFORMANCE PREDICTION OF QUEUEING SYSTEMS WITH SERVICE INTERRUPTION	Prof. Madhu Jain	Prof. Phung-Duc Tuan, University of Tsukuba, Japan Prof. U. C. Gupta, IIT Kharagpur	15.05.24
156.	Mr. Pramod Kumar	MIE	MATHEMATICAL MODELLING AND EXPERIMENTAL CHARACTERISATION OF THE DYNAMIC RESPONSE OF DIELECTRIC ELASTOMER ACTUATORS	Prof. M. M. Joglekar	Prof. Rajeev Kumar, IIT Mandi Prof. Akhilendra Singh, IIT Patna	22.08.23
157.	Mr. Rupak Kumar	MIE	UNDERSTANDING INTERFACIAL ENTRAINMENT PROCESSES AT ADIABATIC THREE-PHASE DOMAIN AND LIQUID-LIQUID BOILING	Prof. Arup Kumar Das	Prof. Shripad T. Revankar, Purdue Univ., USA Prof. Prasad Patnaik B.S.V., IIT Madras	11.09.23
158.	Mr. Rohit Singh	MIE	EXPERIMENTAL INVESTIGATION AND MODELLING OF MACHINING OF DIFFICULT TO CUT MATERIAL USING INTERNALLY COOLED CUTTING INSERT	Prof. Varun Sharma	Prof. Santosh Kumar, IIT (BHU) Varanasi Prof. Anil Kumar Srivastava, Univ. of Texas Rio Grande Valley, US	21.09.23
159.	Mr. Saumitra Mishra	MIE	EXPERIMENTAL AND NUMERICAL INVESTIGATION OF EMISSION CHARACTERISTICS FROM 20-70 KW BURNER FLAMES	Prof. K. B. Mishra	Prof. V. Raghavan, IIT madras Prof. R. V. Ravikrishna, IISc Bangalore	29.09.23
160.	Mr. Vivek Verma	MIE	EXPERIMENTAL AND COMPUTATIONAL INVESTIGATIONS ON MAGNESIUM-BASED COMPOSITES FOR BIODEGRADABLE INTERNAL FRACTURE FIXATION	Prof. Kaushik Pal	Prof. Kantesh Balani, IIT Kanpur Prof. Manoj Gupta, National University Singapore, Singapore	12.10.23
161.	Mr. Dungavath Narayana Swamy Naik	MIE	EXPERIMENTAL INVESTIGATIONS OF PULSEASSISTED CRYO-MICRO LUBRICATION FOR MACHINING OF TI-3AL-2.5V	Prof. Varun Sharma	Prof. Pavan Kumar Kankar, IIT Indore Prof. Anil Kumar Srivastava, Univ. of Texas Rio Grande Valley, US	21.10.23
162.	Mr. Vinay Kumar Yadav	MIE	EFFECT OF THERMO-MECHANICAL TREATMENT ON MECHANICAL AND FATIGUE BEHAVIOR OF AA 2024	Prof. I. V. Singh Prof. Vidit Gaur	Prof. S. Aravindan, IIT Delhi Prof. M. Ramji, IIT Hyderabad Prof. Enrico Salvati, University of Udine, Italy	26.10.23
163.	Mr. Gunipe Prasanth Kumar	MIE	UNDERSTANDING MICROFLUIDIC APPROACHES FOR SLURRY DILATION AND SOLID PARTICLE SEPARATION TARGETING WATER FILTRATION	Prof. Arup Kumar Das	Prof. Suman Chakraborty, IIT Kharagpur Prof. Sushanta Mitra, Unv. of Waterloo, Canada	31.10.23

164.	Mr. Kamaliya Parth Keshavkumar	MIE	ANALYSING CREASE-WRINKLE BEHAVIOUR OF THIN-FILM INFLATABLE SPACE STRUCTURE	Prof. S. H. Upadhyay	Prof. Xiaowei Deng, Univ. of Hong Kong, Hong Kong Prof. Francisco Lopez Jimenez, Univ. of Colordo at Boulder, US	31.10.23
165.	Ms. Kalpana	MIE	STUDY OF HEAT AND MASS TRANSFER IN A SINGLE STORAGE SOLAR ASSISTED LIQUID DESICCANT AIR CONDITIONING SYSTEM	Prof. Sudhakar Subudhi	Prof. Kirti Chandra Sahu, IIT Hyderabad Prof. Shripad T. Revankar, Purdue Univ., USA Prof. Sandip Kumar Saha, IIT Bombay	
166.	Mr. Satish Kumar	MIE	STUDY OF THERMAL INTERACTION OF BOREHOLE HEAT EXCHANGERS WITH GROUND DURING GROUND SOURCE HEAT PUMP APPLICATIONS	Prof. Krishnan Murugesan	Prof. B. Premachandran, IIT Delhi Prof. Arul Prakash K., IIT Madras	10.11.23
167.	Mr. Avik Saha	MIE	STUDY OF GAS-LIQUID INTERFACES USING UNIFIED AND COUPLED MACRO-MICRO SIMULATIONS	Prof. Arup Kumar Das	Prof. Saptarshi Basu, IISc Bangalore Prof. Yanbao Ma, University of California, USA	13.11.23
168.	Ms. Astha Sharma	MIE	MODELLING AND ANALYSIS OF SUPPLY CHAIN RISK IN PHARMACEUTICAL INDUSTRIES	Prof. Dinesh Kumar Prof. Navneet Arora	Prof. S. Venkataramanaiah, IIM Lucknow Prof. Amol Singh, IIM Rohtak	23.11.23
169.	Mr. Saurabh Shambhu Dayal Sharma	MIE	ATOMISTIC SIMULATIONS TO STUDY EFFECT OF HE BUBBLE ON THERMAL AND MECHANICAL PROPERTIES OF NICKEL	Prof. Avinash Parashar	Prof. Hitendra Kumar Malik, IIT Delhi Prof. Rajeev Kapoor, BARC Mumbai	14.12.23
170.	Ms. Duhan Neha Rajkumar	MIE	NUMERICAL SIMULATIONS OF DISLOCATIONS IN SEMICONDUCTOR MATERIALS USING XFEM	Prof. B. K. Mishra Prof. Indra Vir Singh	Prof. Akhilendra Singh, IIT Patna Prof. Timon Rabczuk, Insti. of Structural Mech., Bauhaus University Weimar, Germany	11.01.24
171.	Ms. Priya Singh	MIE	STUDIES ON DISSIMILAR WELD METAL JOINTS FOR ADVANCED ULTRA SUPERCRITICAL POWER PLANT APPLICATIONS	Prof. Navneet Arora	Prof. Leijun Li, University of Alberta, Canada Prof. Ashish Kumar Nath, IIT Kharagpur	29.01.24
172.	Ms. Anjali Jha	MIE	NUMERICAL SIMULATIONS OF HYDRIDE EMBRITTLEMENT IN ZIRCONIUM ALLOY	Prof. Indra Vir Singh Prof. B. K. Mishra	Prof. Tinh Quoc Bui, Tokyo Institute of Tech., Japan Prof. Himanshu Pathak, IIT Mandi	19.01.24
173.	Mr. Palange Rupesh Kishor	MIE	METEHEMATICAL MODELLING OF HEAT AND SPECIES TRANSPORT IN UNDERGROUND COAL GASIFICATION	Prof. Krishnan Murugesan	Prof. V. Raghavan, IIT Madras Prof. Francesco Pepe, Università del Sannio, Italy	25.01.24
174.	Mr. Nishab Ali	MIE	VORTICES DEVELOPMENT AND INTERACTION STUDY ACROSS 180° SHARP BEND OF TWO-PASS RECTANGULAR DUCT WITH AND WITHOUT MATRIX-SUBCHANNELS	Prof. Andallib Tariq	Prof. Manabendra Pathak, IIT Patna Prof. Rakesh Kumar, IIT Kanpur	01.02.24
175.	Mr. Ajay Kumar	MIE	ELECTROMECHANICAL ANALYSIS OF PNEUMATICALLY COUPLED DIELECTRIC ELASTOMER ACTUATOR	Prof. M. M. Joglekar	Prof. Nilanjan Mallik, IIT (BHU) Varanasi Prof. Jacopo Ciambella, Sapienza Univ. of Rome, Italy	02.02.24

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176.	Mr. Rajneesh Kumar	MIE	STUDY OF FLUID FLOW, SOLIDIFICATION AND INCLUSION BEHAVIOR IN CONTINUOUS CASTING MOLD USING EMS	Prof. P. K. Jha	Prof. Govind S. Gupta, IISc Bangalore Prof. Sukanta Kumar Dash, IIT Kharagpur	08.02.24
177.	Mr. Anil Singh	MIE	A STUDY OF PLAIN/CONICAL HYBRID POROUS JOURNAL BEARINGS SYSTEM	Prof. S. C. Sharma	Prof. Braham Prakash, Luleå Univ. of Technology, Sweden Prof. S. Yoshimoto, Tokyo Univ. of Sci., Japan	12.02.24
178.	Ms. Madhuri Bhadauria	MIE	CONVECTIVE HEAT TRANSFER FROM CHANNEL TO MODERATOR FOR IPHWR DURING LOCA	Prof. Ravi Kumar Prof. Arup Kumar Das	Prof. P. M. V. Subbarao, IIT Delhi Prof. Uwe Hampel, Technische Universität Dresden, Dresden	16.02.24
179.	Mr. Aswani Kumar Singh	MIE	EXPERIMENTAL INVESTIGATIONS INTO ULTRASONIC ASSISTED GRINDING OF DIFFICULT TO CUT MATERIALS WITH ULTRASONICALLY ATOMIZED GREEN SOLVENTS	Prof. Varun Sharma	Prof. Ajay Muljibhai Sidpara, IIT Kharagpur Prof. Faiz Iqbal, University of Lincoln, UK Prof. Harpreet Singh, IIT Ropar	01.03.24
180.	Mr. Godasu Ashwin Kumar	MME	THERMOMECHANICAL PROCESSING OF ALLOY 625 AND ITS MECHANICAL PROPERTIES UNDER STATIC AND DYNAMIC LOADING	Prof. Suhrit Mula Prof. Ujjwal Prakash	Prof. Nithyanand Prabhu, IIT Bombay Prof. Wolfgang Bleck, RWTH Aachen University, Germany	17.10.23
181.	Mr. Arpan Arora	MME	FE-42NI INVAR-BASED ODS STEELS DEVELOPED BY MECHANICAL ALLOYING + SPARK PLASMA SINTERING	Prof. Suhrit Mula	Prof. N. K. Mukhopadhyay, IIT (BHU) Varanasi Prof. Suryanarayana Challapalli, Univ. of Central Florida, USA	06.12.23
182.	Mr. Ankur	MME	CORROSION BEHAVIOR OF HEAT-TREATED 7068 ALUMINIUM ALLOY	Prof. G. P. Chaudhari	Prof. V. S. Raja, IIT Bombay Prof. Kallol Mondal, IIT Kanpur	28.02.24
183.	Mr. Vaibhav Jain	MME	MULTISCALE CARBON FILLER REINFORCED EPOXY COMPOSITE FOR STRUCTURAL APPLICATIONS	Prof. Debrupa Lahiri Dr. Kinshuk Dasgupta	Prof. Naresh Bhatnagar IIT Delhi Prof. Hom Nath Dhakal, University of Portsmouth, UK	12.04.24
184.	Mr. Himanshu	MS	IMPACT OF FAIR VALUE ACCOUNTING ON FINANCIAL REPORTING QUALITY: INDIAN EVIDENCE	Prof. J. P. Singh	Prof. Hafez Abdo, Nottingham Univ. Business, UK Prof. Prabina Rajib, IIT Kharagpur	03.08.23
185.	Ms. Prachi Thakur	MS	DIVERSITY TRAINING IN HOSPITALITY	Prof. R. L. Dhar	Prof. Saumya Singh, IIT (ISM) Dhanbad Prof. Rupashree Baral, IIT Madras	18.08.23
186.	Ms. Shumaila Chandni	MS	LINKING EMPLOYEE ENGAGEMENT AND CUSTOMER ENGAGEMENT TO DRIVE CUSTOMER LOYALTY: REORIENTING SERVICE PROFIT CHAIN	Prof. Z. Rahman	Prof. Varisha Rehman, IIT Madras Prof. Arti D. Kalro, IIT Bombay	12.09.23
187.	Ms. Ayushi Yadav	MS	EFFECT OF JOB CRAFTING ON JOB PERFORMANCE: THE INFLUENCING ROLE OF WORK ENGAGEMENT AND LMX	Prof. R. L. Dhar	Prof. Seema Sharma, IIT Delhi Prof. Saumya Singh, IIT (ISM) Dhanbad	25.09.23
188.	Ms. Pooja Kapoor	MS	AN ANALYSIS OF INFLATION EXPECTATIONS AND PERCEPTIONS IN THE INDIAN CONTEXT	Prof. Sujata Kar	Prof. Puja Padhi, IIT Mumbai Prof. Andrea Paltrinieri, Catholic Univ. of Sacre Heart, Italy	10.11.23

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189.	Mr. Rahul Singh Rathore	MS	DEVELOPING A SCORECARD FOR TECHNOLOGY BUSINESS INCUBATION PROGRAM IN INDIAN HEIs	Prof. Rajat Agarwal	Prof. Kaushik V. Pandya, Sheffield Hallam University, UK Prof. Manoj Lal Shrestha, Konan University, Japan	16.11.23
190.	Ms. Ruchi Moolchandani	MS	FACTORS INFLUENCING CORPORATE CASH HOLDINGS: EVIDENCE FROM INDIA	Prof. Sujata Kar	Prof. M. Thenmozhi, IIT Madras Prof. Nicolas Aubert, Aix-Marseille Univ., France	10.11.23
191.	Mr. Gaurav Jyoti	MS	UNRAVELING THE IMPLICATIONS OF CORPORATE SUSTAINABILITY ON FIRMS FINANCIAL PERFORMANCE: AN EMPIRICAL EVIDENCE FROM NIFTY-500 FIRMS	Prof. Ashu Khanna	Prof. Shveta Singh, IIT Delhi Prof. Prabina Rajib, IIT Kharagpur	13.12.23
192.	Mr. Saurabh Ardra	MS	ANALYSIS AND DESIGN OF FRAMEWORK FOR CIRCULAR FOOD SUPPLY CHAIN IN INDIA	Prof. M. K. Barua	Prof. Sandeep Mondal, IIT (ISM) Dhanbad Prof. Bhaba Krishna Mohanty, IIM, Lucknow Prof. Ravi Shankar, IIT Delhi	29.01.24
193.	Ms. Sudeshna Rath	MS	MANUFACTURING COMPETITIVENESS THROUGH SIX SIGMA IN STEEL INDUSTRY	Prof. Rajat Agrawal	Prof. Athanasios Papadopoulos, University of Kent, UK Prof. Prabhas Bhardwaj, IIT (BHU) Varanasi	25.01.24
194.	Ms. Sakshi Srivastava	MS	A STUDY ON AI AND BIG DATA PRACTICES AND DATADRIVEN DECISION-MAKING	Prof. Gaurav Dixit	Prof. Sujeet K. Sharma, IIM Nagpur Prof. Patrick Mikalef, Norwegian Univ. of Sci. and Tech., Norway	13.02.24
195.	Ms. Rahila Aziz Chat	MS	CHRONIC BRAND HATE: CONCEPTUALIZATION, SCALE DEVELOPMENT AND VALIDATION	Prof. Z. Rahman	Prof. Regina Connolly, Dublin City University, Ireland Prof. Mahim Sagar, IIT Delhi	04.03.24
196.	Mr. Santosh Anand	MS	ACHIEVING SUSTAINABILITY AND FOOD SECURITY THROUGH POST-HARVEST LOSS AND WASTE REDUCTION IN THE AGRI-FRESH PRODUCE SUPPLY CHAIN	Prof. M. K. Barua	Prof. Rudra P. Pradhan, IIT Kharagpur Prof. Godwin Tennyson, IIM Trichy	14.03.24
197.	Mr. Aakash Khindri	MS	IMPACT OF WORKPLACE CURIOSITY AND FUTURE SELF CONTINUITY ON GRIT OF EMPLOYEES	Prof. S. Rangnekar	Prof. Kanika T. Bhal, IIT Delhi Prof. Susmita Mukhopadhyay, IIT Kharagpur	15.03.24
198.	Ms. Monika Sharma	MS	BRAND ANTHROPOMORPHISM STRENGTH: CONCEPTUALIZATION, CONSTRUCT DEVELOPMENT AND MEASUREMENT VALIDATION	Prof. Z. Rahman	Prof. Cleopatra Veloutsou, University of Glasgow, UK Prof. Mahim Sagar, IIT Delhi	28.03.24
199.	Ms. Nupur Sharma	MS	IMPACT OF WORKPLACE OSTRACISM ON WORKPLACE DEVIANCE AND SERVICE SABOTAGE: ROLE OF EMOTIONAL EXHAUSTION AND MORAL IDENTITY	Prof. R. L. Dhar	Prof. Pooja Purang, IIT Bombay Prof. Anita Sarkar, XLRI Xavier School of Management, Jamshedpur	15.05.24
200.	Ms. Swati Singh	NT	THERAPEUTIC USE OF CUO-BIOPOLYMER BASED NANOPARTICLES FOR TARGETED DRUG DELIVERY TOWARDS BREAST CANCER	Prof. Kaushik Pal	Prof. Rama Shanker Verma, IIT Madras Prof. Rohit Srivastava, IIT Bombay	08.08.23

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201.	Mr. Siddharth Sharma	NT	FABRICATION OF TRANSITION METAL NITRIDE THIN FILM BASED BIOCOMPATIBLE AND FLEXIBLE SUPERCAPACITORS	Prof. Ramesh Chandra	Prof. R. Jayaganthan, IIT Madras Prof. Yogendra Kumar Mishra, University of Southern Denmark	21.10.23
202.	Mr. Atif Suhail	NT	INORGANIC HALIDE PEROVSKITE NANOCRYSTALS FOR OPTOELECTRONICS APPLICATION	Prof. Monojit Bag	Prof. Pabitra Kumar Nayak, Tata Institute of Fundamental Res., Hyderabad Prof. Dhandapani Venkataraman, Univer. of Massachusetta Amherst, US	31.01.24
203.	Mr. Abhinav Tandon	NT	DESIGN AND DEVELOPMENT OF NEXT-GENERATION BINDER-FREE LITHIUM-ION BATTERY	Prof. Yogesh Kumar Sharma	Prof. Amartya Mukhopadhyay, IIT Bombay Prof. Tseung-Yuen Tseng, National Yang Ming Chiao Tung University, Taiwan	08.02.24
204.	Ms. Akanksha Rajendra Urade	NT	GRAPHENE GROWTH ON ELECTRODEPOSITED NI/CU SUBSTRATE	Prof. Indranil Lahiri Prof. K. S. Suresh	Prof. V. Subramanya Sarma, IIT Madras Prof. N. P. Gurao, IIT Kanpur	21.02.24
205.	Mr. Mukesh Kumar Sharma	PH	DENSITY FUNCTIONAL THEORY AND MONTE CARLO STUDY OF CERTAIN MAGNETIC AND MULTIFERROIC MATERIALS	Prof. Tulika Maitra	Prof. Alok Shukla, IIT Bombay Prof. Tarun Kanti Ghosh, IIT Kanpur	27.09.23
206.	Ms. Pooja Yadav	PH	EXPERIMENTAL AND THEORETICAL INVESTIGATIONS OF QUANTUM TRANSPORT IN SHALLOW AND DEEP DONOR BASED SINGLE ELECTRON TRANSISTORS	Prof. Arup Samanta	Prof. Suddhasatta Mahapatra, IIT Bombay Prof. Enrico Prati, Università Statale di Milano, Lombardia, Italia	09.10.23
207.	Mr. Gopal Yadav	PH	ASPECTS OF THERMAL QCD PHENOMENOLOGY AT INTERMEDIATE GAUGE/T HOOFT COUPLING FROM STRING/M-THEORY, (HD) GRAVITY ISLANDS, AND MULTIVERSE	Prof. Aalok Misra	Prof. Sudhakar Panda, NISE&R, Jatni Padanpur Prof. Neils A. Obers, Neils Bohr Institute, Denmark	12.10.23
208.	Mr. Salman Ahamad Khan	PH	SOME ASPECTS OF A HOT QCD MEDIUM IN PRESENCE OF MAGNETIC FIELD	Prof. B. Krishna Patra	Prof. Nora Brambilla, Technical University of Munich, Germany Prof. Sourav Sarkar, Variable Energy Cyclotron Centre, Kolkata	16.10.23
209.	Ms. Anita Kumari	PH	TRANSPORT PROPERTIES OF HIGH TEMPERATURE SUPERCONDUCTORS	Prof. Tashi Nautiyal Prof. B. D. Indu Prof. G. D. Verma	Prof. Manish Kumar, JNU New Delhi Prof. Ctirad Uher, University of Michigan, USA Prof. Arti Kashyap, IIT Mandi	17.10.23
210.	Mr. Himanshu Chauhan	PH	GROWTH AND STUDY OF STRUCTURAL AND SUPERCONDUCTING PROPERTIES OF FE (TE, SE) THIN FILMS AND SINGLE CRYSTALS	Prof. G. D. Verma	Prof. Israel Felner, The Hebrew Univ., Israel Prof. V. P. S. Awana, CSIR-NPL, New Delhi Prof. Neeraj Khare, IIT Delhi	08.12.23

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211.	Mr. Sagar Kumar Verma	PH	PLASMONIC METASURFACES FOR EXTRA-ORDINARY TRANSMISSION AND ABSORPTION OF LIGHT IN VISIBLE TO IR REGIME	Prof. Sachin Kumar Srivastava	Prof. Dibakar Roy Chowdhury, Mahindra University, Hyderabad Prof. Senthil Murugan Ganapathy, Optoelectronics Res. Centre, University of Southampton, UK	17.01.24
212.	Mr. Rishabh Kumar	PH	FACETS OF FUSION AND FISSION DYNAMICS INVESTIGATED VIA HEAVY-ION REACTIONS AROUND THE COULOMB BARRIER	Mr. Rishabh Kumar	Prof. B. K. Nandi, IIT Bombay Prof. Rolf-Dietmar Herzberg, University of Liverpool, UK	30.01.24
213.	Mr. Sachin Verma	PH	THEORETICAL STUDY OF THE SPECTRAL PROPERTIES AND THERMOELECTRIC TRANSPORT ACROSS SUPERCONDUCTOR/NORMAL METAL AND QUANTUM DOT HYBRID NANODEVICES	Prof. Ajay	Prof. Elena Bascones, Instituto de Ciencia de Mat. De Madrid, Sor Juana Lnes de la Cruz, Spain Prof. Alexander Melnikov, Russian Acad. of Sci.	15.02.24
214.	Mr. Manish Kumar Vishwakarma	PH	INVESTIGATION OF CHARGE CARRIER DYNAMICS AND DIELECTRIC RELAXATION BEHAVIOUR IN METAL OXIDES	Prof. Puneet Jain	Prof. Dipti Gupta, IIT Bombay Prof. D. Venkataraman, University of Massachusetts Amherst, US	26.02.24
215.	Mr. Hemant Rathi	PH	ADS2/CFT1 AT FINITE DENSITY AND HOLOGRAPHIC ASPECTS OF 2D BLACK HOLE	Prof. Dibakar Roychowdhury	Prof. Justin R. David, IISc Bangalore Prof. Alessandro Torrielli, University of Surrey, Guildford, United Kingdom	28.02.24
216.	Mr. Tanuj Chamoli	PH	TUNABLE JOSEPHSON TRANSPORT THROUGH SINGLE AND DOUBLE QUANTUM DOTS JUNCTION AT INFINITE-U LIMIT	Prof. Ajay	Prof. J. P. Singh, IIT Delhi Prof. Saurabh Basu, IIT Guwahati	15.02.24
217.	Mr. Debarshi Dey	PH	THERMOELECTRIC AND HEAVY QUARK TRANSPORT COEFFICIENTS OF HOT QCD MATTER IN THE PRESENCE OF MAGNETIC FIELD	Prof. B. K. Patra	Prof. Igor Shovkovy, Arizona State Univ., USA Prof. Joan Soto, University de Barcelona, Spain	05.03.24
218.	Mr. Virender Ranga	PH	PROTON AND ALPHA INDUCED REACTIONS ON LIGHT NUCLEI FOR NUCLEAR STRUCTURE AND ASTROPHYSICS	Prof. Anil Kumar Prof. Indranil Mazumdar	Prof. Basanta Kumar Nayak, HBNI, Mumbai Prof. Maria Kmiecik UL. Radzikowskiego, Poland	07.03.24
219.	Mr. Rahul Rathi	PH	AIRGLOW IMAGING OBSERVATIONS OF EARTH'S UPPER ATMOSPHERE	Prof. Sumanta Sarkhel	Prof. Yuichi Otsuka, Nagoya University, Japan Prof. Shikha Raizada, Univ. of Central Florida, USA	22.03.24
220.	Ms. Madhu	PH	NUCLEAR STRUCTURE INVESTIGATIONS IN TRANSITIONAL REGION AROUND DOUBLY-MAGIC 208Pb	Prof. Ajay Y. Deo	Prof. Alison Bruce, University of Brighton, Brighton, UK Prof. Maitreyee Saha Sarkar, SINP, Kolkata	22.03.24
221.	Ms. Chhavi Verma	PPE	IRIDESCENT STRUCTURAL COLORATION AND SELF ASSEMBLY OF CHIRAL NEMATIC CELLULOSE NANOCRYSTAL COMPOSITES	Prof. P. K. Maji	Prof. Santanu Chattopadhyay, IIT Kharagpur Prof. Kheng Lim Goh, Newcastle University, Singapore	21.09.23

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222.	Ms. Vaishali Mittal	PPE	BIODIESEL PRODUCTION FROM MICROALGAE THROUGH NANOCATALYTIC TRANSESTERIFICATION PROCESS	Prof. U. K. Ghosh	Prof. Ki-Hyun Kim, Hanyang University, Korea Prof. Asheesh Kumar Yadav, CSIR Bhubaneswar Prof. Devendra P. Saroj, University of Surrey, UK	02.01.24
223.	Mr. Ajay Vishwakarma	PPE	FIRE RETARDANCY BEHAVIOUR OF COTTON FABRIC COATED WITH BIO AND SYNTHETIC MATERIALS	Prof. S. Chattopadhyay Prof. Aravind Dasari	Prof. Amit Kumar, IIT Madras Prof. Jimenez Maude, University of Lille, France	11.04.24
224.	Mr. Saureng Kumar	PT	WIRELESS SENSOR NETWORK-BASED REAL-TIME INTELLIGENT TRANSPORTATION SYSTEM FOR STORAGE CONDITIONS ASSESSMENT IN SUPPLY CHAIN MANAGEMENT	Prof. S. C. Sharma	Prof. Ravi Shankar Singh, IIT (BHU) Varanasi Prof. Xiao-Zhi Gao, University of Eastern Finland, Finland	06.10.23
225.	Mr. Kaushal Kumar	PT	DEVELOPMENT OF LATERAL N-TYPE CHARGED PLASMABASED HETERO-STRUCTURE JUNCTIONLESS TUNNEL FET	Prof. S. C. Sharma	Prof. Ravi Kumar Gangwar, IIT (ISM) Dhanbad Prof. Jemal Abawajy, Deakin Univ., Australia Prof. Sudheer Kumar, IIT Kanpur	09.10.23
226.	Ms. Preeti Yadav	PT	DEVELOPMENT OF AN EFFICIENT LOCALIZATION SCHEME IN WIRELESS SENSOR NETWORKS USING MACHINE LEARNING	Prof. S. C. Sharma	Prof. Ravi Shankar Singh, IIT (BHU) Varanasi Prof. Ajit K. Verma, Western Norway Univ. of Applied Sciences, Norway	09.10.23
227.	Mr. Satish Kumar Singh	PT	APPLICATION OF FORWARD OSMOSIS PROCESS FOR SECONDARY TREATED EFFLUENT OF PULP AND PAPER INDUSTRY	Prof. Chhaya Sharma Prof. Abhijit Maiti	Prof. Mihir Kumar Purkait, IIT Guwahati Prof. Oded Nir, Ben-Gurion University of the Negev, Israel	13.11.23
228.	Mr. Saurabh Kumar Kardam	PT	VAPOR-PHASE STUDY OF ANTIMICROBIAL PACKAGING SYSTEMS CONTAINING ESSENTIAL OILS	Prof. Dharm Dutt, Prof. Ashish A. Kadam	Prof. Ajay Kathuria, California Polytechnic State Univ., California Prof. Sampa Saha, IIT Delhi Prof. Mario Scetar, University of Zagreb, Croatia	29.01.24
229.	Mr. Nandkishor Joshi	PT	DEVELOPMENT OF ENERGY HARVESTING MODEL AND OPTIMIZATION OF IEEE 802.11 DCF MAC PROTOCOL FOR COGNITIVE RADIO NETWORK	Prof. S. C. Sharma	Prof. Preetam Kumar IIT Patna Prof. Ajit Kumar Verma, Western Norway University of Applied Sci., Norway	15.02.24
230.	Ms. Pooja Yadav	PT	DETECTION OF CHRONIC DISEASE AND ANALYSIS OF HYPERPARAMETERS USING DEEP LEARNING TECHNIQUES	Prof. S. C. Sharma	Prof. Ajit Kumar Verma, Western Norway Univ. of Applied Sci., Norway Prof. Preetam Kumar, IIT Patna	22.02.24
231.	Ms. Konala Akhila	PT	DESIGN AND DEVELOPMENT OF POLYPHENOLIC BASED FLEXIBLE pH INDICATORS FOR SMART FOOD PACKAGING	Prof. K. K. Gaikwad	Prof. Pramod V. Mahajan, Leibniz-Institut für Agrartechnik und Bioökonomie e.V., Germany Dr. Rajeshwar S. Matche, CSIR Mysuru	09.05.24
232.	Mr. Mohale Vijay Pandurang	WRDM	ANALYSIS OF SUB SYNCHRONOUS OSCILLATION IN HYDROPOWER SYSTEMS	Prof. Thanga Raj Chelliah	Prof. Suryanarayana Doolla, IIT Bombay Prof. Hamid Toliyat, Texas A&M University, USA	03.08.23

233.	Mr. Nand Kishore Sharma	WRDM	SOIL CONSERVATION SERVICE-CURVE NUMBER METHODOLOGY MODIFIED FOR IMPROVED DIRECT RUNOFF ESTIMATION	Prof. S. K. Mishra Prof. Ashish Pagndey	Prof. Yutaka Matsuno, Kindai University, Japan Prof. Richard H. McCuen, Univ. of Maryland, USA	13.12.23
234.	Mr. Ishan Sharma	WRDM	A CRITICAL INVESTIGATION OF SCS-CN METHODOLOGY FOR RAINFALL-RUNOFF MODELLING	Prof. S. K. Mishra Prof. Ashish Pandey	Prof. N. S. Raghuwanshi, IIT Kharagpur Prof. Ronny Berndtsson, Lund Univ., Sweden	12.02.24
235.	Mr. Wasu Manawko Tefera	WRDM	AN INTEGRATED MODELING APPROACH FOR HYDROPOWER POTENTIAL ASSESSMENT AND SUITABILITY ANALYSIS	Prof. K. S. Kasiviswanathan	Prof. RAAJ Ramsankaran, IIT Mumbai Prof. Jianxun He, Univ. of Calgary, Canada	20.03.24
236.	Mr. Melese Baye Hailu	WRDM	RAINFALL-RUNOFF AND SEDIMENT YIELD MODELLING UNDER CLIMATE CHANGE	Prof. S. K. Mishra Dr. Sanjay Kumar	Prof. Ronny Berndtsson, Lund Univ., Sweden Prof. Manish Kumar Goyal, IIT Indore	21.03.24
237.	Mr. Javed Ali	WRDM	INVESTIGATION OF ELECTROMAGNETICALLY INDUCED VIBRATIONS IN ASYNCHRONOUS HYDROGENERATOR	Prof. Thanga Raj Chelliah Prof. Pramod Agarwal	Prof. Sriram Srinivas, IIT Madras Prof. Joseph Olorunfemi Ojo, Tennessee Tech. University, USA	02.04.24