सीनेट की चौरानबेवीं बैठक का कार्यवृत्त

MINUTES OF THE 94TH MEETING OF THE SENATE

22 फरवरी 2023
22nd FEBRUARY 2023

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

सूची / INDEX

07 MAR 2023

94.6	संस्थान के मास्टर और पीएचडी कार्यक्रम में प्रवेश के लिए प्रथम रैंक धारक (स्वर्ण पदक विजेता) महिला उम्मीदवारों के लिए 'गोल्डनगर्ल' के प्रस्ताव पर विचार करना। To consider a proposal – 'Golden Girl' for the FIRST Rank Holder (Gold Medallist) female candidates for admission in the Masters and Ph.D. Programmes of the Institute.	3
94.7	आपदा नयूनीकरण और प्रबंधन कार्यक्रम कें एम.टेक कार्यक्रम में अतिरिक्त सीटों के प्रस्ताव पर विचार करना। To consider the additional seats in the M.Tech. programme in Disaster Mitigation & Management programme.	3
94.8	सेमीकंडक्टर प्रौद्योगिकी में ताइवान के तीन विश्वविद्यालयों के सहयोग से संयुक्त एम.टेक. कार्यक्रम में प्रवेश के लिए कार्यक्रम संरचना, न्यूनतम शैक्षिक योग्यता, पात्र गेट विषयों और सीट मैट्रिक्स पर विचार करना। To consider the program structure, minimum educational qualification, eligible GATE disciplines and seat matrix for admission to Joint M.Tech. programmes in Semiconductor Technology in collaboration with three universities from Taiwan.	4
94.9	एम.टेक कार्यक्रम के लिए पात्रता मानदण्ड और गेट विषयों में संशोधन के निम्न प्रस्तावों पर विचार करना। 1. निम्नलिखित विभागों में एम.टेक कार्यक्रम में प्रवेश के लिए न्यूनतम शैक्षिक योग्यता (एमईक्यू) में परिवर्तन (i) कम्पयूटर विज्ञान और अभियान्त्रिकी विभाग (ii) धातुकर्म और सामग्री अभियान्त्रिकी विभाग (iii) अनुप्रयुक्त गणित और वैज्ञानिक कम्यूटिंग विभाग 2. निम्नलिखित विभागों में एम.टेक. कार्यक्रम में प्रवेश के लिए पात्र गेट विषयों में परिवर्तन। (i) हाइड्रो और नवीकरणीय ऊर्जा विभाग (ii) धातुकर्म और सामग्री अभियान्त्रिकी विभाग (iii) आपदा न्यूनीकरण और प्रबंधन में उत्कृष्टता केंन्द्र (iv) मेहता फैमिली स्कूल ऑफ डेटा साइंस एण्ड आर्टिफिशियल इंटेलिजेंस To consider the revision in eligibility criteria and GATE Disciplines for M.Tech. programmes as proposed below: 1. Change(s) in Minimum Educational Qualification (MEQ) for admission to M.Tech. programmes in the following Departments. (i) Department of Computer Science and Engineering (ii) Department of Metallurgical and Materials Engineering (iii) Department of Applied Mathematics and Scientific Computing	4

07 MAR 2023

	2. Change(s) in eligible GATE disciplines for admission to M.Tech. programmes in the following Departments: (i) Department of Hydro and Renewable Energy (ii) Department of Metallurgical and Materials Engineering (iii) Centre for Excellence in Disaster Mitigation and Management (iv) Mehta Family School of Data Science and Artificial Intelligence	
94.10	शैक्षणिक सत्र 2023–24 के लिए एम.टेक./एम.आर्क/एम.यू.आर.पी कार्यक्रमों के लिए सीट मैट्रिक्स Seat matrix for M.Tech./M.Arch./MURP programmes for Academic Session 2023-24.	5
94.11	सत्र 2023–24 के लिए यूजी कार्यक्रमों के लिए इनटेक/सीट मैट्रिक्स पर विचार करना। To consider the intake/ seat matrix for UG programs for the session 2023-24.	5
94.12	मास्टर छात्र की स्थिति को पूर्णकालिक से अंशकालिक में परिवर्तित करते समय एनओसी की आवश्यकता के मौजूदा प्रावधान में संशोधन करने पर विचार करना। To consider the revision in the existing provision of the requirement of NOC while converting the status of a Master student from Full-Time to Part-Time.	5
94.13	2022 के जेम्स थॉमसन स्कॉलरशिप (जेटीएस) के अनुदान के लिए श्री रुषित प्रेमल पंचोली (नामांकन संख्या 22114081) के अनुरोध पर विचार करना। To consider the request from Mr. Rushit Premal Pancholi (Enrol. No. 22114081) for a grant of the James Thomason Scholarship (JTS) of 2022.	5
94.14	निम्नलिखित पूर्व–पीएचडी छात्रों की शैक्षणिक पंजीकरण की बहाली के लिए उनकी दया अपीलों पर विचार करना। (i) श्री अक्षय कुमार यादव (एन.सं.1799016), गणित विभाग (ii) श्री सप्तर्षि कोलय (एन.सं.14902011), वास्तुकला एवम् योजना विभाग To consider the Mercy Appeals of the following ex-Ph.D. students, for reinstatement of their academic registration. (i) Mr. Akshay Kumar Yadav (En. No.: 1799016), Department of Mathematics. (ii) Mr. Saptarshi Kolay (En. No.: 14902011), Department of Arch. & Planning.	6

07 MAR 2023

07 MAR 2023

07 MAR 2023

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE
MEETING SECTION

Minutes of the 94th Meeting of the Senate held on 22.02.2023 at 03.30 P.M. in the Senate Hall.

The list of participants who attended the meeting and those could not attend are appended at **Annexure-I & Annexure-II** respectively.

At the outset, the Chairman welcomed the members to the 94th meeting of the Senate. In his opening remarks he laid emphasis to the Multidisciplinary Research, Joint Research Projects, and International Collaboration.

Further, the Chairman Senate suggested to explore more the new areas for research like in Agriculture and sustainability projects under GATI SHAKTI. He advised that the young faculty members should be encouraged, motivated and facilitated as it will enhance the research impact factor.

The Senate was informed about to be soon created International Centre of Excellence for Dams, for which a financial support of Rs.108.99 cr. has been approved by MoJS under DRIP & appreciated the initiatives of Prof. N.K. Goel and his team in this regard.

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

1. Prof. S.C. Sharma, Department of Mech. & Ind. Engg
2. Prof. Anil Kumar Gaurishetty, Assoc. Dean of Students' Activities

After a welcome remarks for the following new members of the Senate.

1. Prof. M.V. Sunil Krishna, Assoc. Dean of Students' Activities
2. Prof. Soumitra Satapathi, Head, Centre for Flexible and Smart Energy Device (CFSE).

07 MAR 2023

The agenda was then taken up.

Item No. 94.1: To confirm the minutes of the 93rd Senate meeting held on 28.12.2022.

The Senate accepted the points as received under comments on item 93.6 and confirmed the minutes as circulated on 02.01.2023 with this change. The concerned clause shall now be read as – "Candidates shall earn all credits for the course work (excluding thesis) of a M.Tech. Programme offered by the parent department/centre/school. The requirement of earning credits for pre-Ph.D. courses will be waived-off for such candidates."

Item No. 94.2: To report on the actions taken to implement the decisions of the Senate taken in its 93rd meeting held on 28.12.2022.

The Senate noted the actions taken on the minutes.

Item No. 94.3: To consider the revised proposal of the UG Curriculum Revision Committee (UCRC).

The Senate considered and accepted the proposal as given in **Appendix-A.**

Further, the Senate suggested to send it to the academic departments and academic centres for designing the department wise programme specific structures, courses/course baskets according to the approved basic structure. The departments/centres/school are to submit the above to the Dean, Academic Affairs by the end of March 2023.

The Senate placed on record its sincere appreciation to all who contributed in developing the curriculum structure, in particular, the resource persons of the Workshop on UG Academic Curriculum Development.

07 MAR 2023

Item No. 94.4: To consider the proposal of the Department of Management Studies regarding reallocation of credits.

The Senate considered and approved the proposal of the Department of Management Studies regarding reallocation of credits as given below:

Course Code	Course Title	Subject Area	Credits
BMN:601	Business Simulation for Capstone	PCC	1.5
BMN:602	Summer Training	PCC	1.5
BMN:610	Major Project	RP	6

Item No. 94.5: To consider the proposal for an earliest submission date for Masters' Thesis.

The Senate considered the proposal and approved 1st May every year as the earliest date of submission of Masters' Thesis.

Item No. 94.6: To consider a proposal – 'Golden Girl' for the FIRST Rank Holder (Gold Medallist) female candidates for admission in the Masters and Ph.D. Programmes of the Institute.

The Senate considered and accepted the proposal – 'Golden Girl' for the FIRST Rank Holder female candidate from the top 50 NIRF (in the OVERALL category in the most recent year) in all available disciplines for admission in the Masters and Ph.D. Programmes of the Institute. The intake for such candidates shall be supernumerary.

Item No. 94.7: To consider the proposal for additional seats in the M.Tech. programme in Disaster Mitigation & Management programme.

The Senate considered and approved the following (with the changes in the GATE disciplines) for additional seats in M.Tech. programme in Disaster Mitigation & Management:

Name of Programme	Existing		EWS	Total	New		EWS	Total
	Main GATE Discipline	Other GATE Discipline			Main GATE Discipline	Other GATE Discipline		
M.Tech. Disaster Mitigation & Management	CE (5)	ME/PI/CS/ CH/AR/GG/ PH/MA/XL/ XE/EY/BT (5)	1	11	CE (5)	ME/PI/CS/ CH/AR/GG/ PH/MA/XL/ XE/EY/BT/G E (13)	2	20

07 MAR 2023

Item No. 94.8: **To consider the program structure, minimum educational qualification, eligible GATE disciplines and seat matrix for admission to Joint M.Tech. programmes in 'Semiconductor Technology' in collaboration with three universities from Taiwan.**

The Senate considered and approved the proposal, along with the program structure as given in **Appendix-B.** The Senate decided that the intake for the programme shall be 15.

Further, the Senate decided that the candidates be allowed to register in the ECE department. This joint collaborative programme be offered in coordination with the Department of Physics.

Item No. 94.9: **To consider the revision in eligibility criteria and GATE Disciplines for M.Tech. programmes as proposed below:**

1. **Change(s) in Minimum Educational Qualification (MEQ) for admission to M.Tech. programmes in the following Departments:**
   - **(i) Department of Computer Science and Engineering**
   - **(ii) Department of Metallurgical and Materials Engineering**
   - **(iii) Department of Applied Mathematics and Scientific Computing**

2. **Change(s) in eligible GATE disciplines for admission to M.Tech. programmes in the following Departments:**
   - **(i) Department of Hydro and Renewable Energy**
   - **(ii) Department of Metallurgical and Materials Engineering**
   - **(iii) Centre for Excellence in Disaster Mitigation and Management**
   - **(iv) Mehta Family School of Data Science and Artificial Intelligence**

The Senate considered and approved the proposals.

Further, the Senate suggested that in the Minimum Educational Qualification (MEQ), "or equivalent" be replaced by "or equivalent in the relevant discipline".

07 MAR 2023

Item No. 94.10: Seat matrix for M.Tech./M.Arch./MURP programmes for the Academic Session 2023-2024.

The Senate approved the proposal as given in **Appendix 'C'.**

Item No. 94.11: To consider the intake/seat matrix for UG programs for the session 2023-24.

The Senate considered and approved the UG seat matrix for the academic year 2023-2024 as given in **Appendix-D.**

Item No. 94.12: To consider the revision in the existing provision of the requirement of NOC while converting the status of a Masters student from Full-Time to Part-Time.

The Senate considered and approved the following revision on a provision for NOC from Master students converted to Part Time:

If a student wishes to join an organization, he/she can request for change of his/her status to part-time, provided that he/she completes all the course work requirements and submits the copy of the offer letter. The Dean of Academic Affairs can approve the request on the recommendation of DAPC/CAPC/ ScAPC.

After conversion from full time to part time, the student has to work 9 (nine) months for each remaining stage of the thesis. However, such students have to complete the degree requirements within 4 years from the date of initial registration.

Item No. 94.13: To consider the request from Mr. Rushit Premal Pancholi (Enrol. No. 22114081) for a grant of the James Thomason Scholarship (JTS) of 2022.

The Senate did not accept the request for change in the JEE rank cut-off criteria for James Thomason Scholarship (JTS) of 2022.

07 MAR 2023

Item No. 94.14: **To consider the Mercy Appeals of the following ex-Ph.D. students, for reinstatement of their academic registration.**

(i) Mr. Akshay Kumar Yadav (En. No.: 1799016), Department of Mathematics.

(ii) Mr. Saptarshi Kolay (En. No.: 14902011), Department of Arch. & Planning.

The Senate considered the mercy appeals of the following ex-Ph.D. students regarding re-instatement of their academic registration and decided the following:

S. No.	Name, Enrollment No., Deptt.	Request Accepted/ Not Accepted
1.	Mr. Akshay Kumar Yadav (En. No.: 1799016), Department of Mathematics	Not Accepted
2.	Mr. Saptarshi Kolay (En. No. 14902011), Department of Arch. & Planning.	Accepted the request as a special case; a warning be issued to the student by the AAO stating that further leniency in registration be avoided.

Item No. 94.15: **To consider the seat matrix for Ph.D. admission in Autumn Semester 2023-2024.**

The Senate considered and approved the seat matrix for Ph.D. admission in Autumn Semester 2023-2024. **(Appendix-E)**

Item No.94.16: **To report the approvals accorded by the Chairman, Senate.**

The Senate noted the items.

ANY OTHER ITEM

Item No. 94.17: **To consider the revision in eligibility criteria for admission in the Ph.D. programmes offered by the Department of Biosciences and Bioengineering, Department of Polymer and Process Engg. and the Centre for Nanotechnology under the QIP scheme.**

The Senate considered and approved the proposal to drop Pharmacy from the existing MEQs for admission into the Ph.D. programmes offered by the Department of Biosciences and Bioengineering, Department of Polymer and Process Engg. and the Centre for Nanotechnology under the QIP scheme.

07 MAR 2023

Item No. 94.18: **To consider award of 42 Ph.D. Degrees, received after the 93rd Senate for the students who have completed the requirements for award of degrees w.e.f. 26.12.2022.**

The Senate considered and recommended to the Board of Governors to include these 42 PhD Degrees for the award to the students who have duly qualified for the same **Appendix-F**.

Item No.94.19: **To Consider the representations of Mr. Veesam Chandra Reddy (Enrl No. 17918020), a Ph. D. student enrolled in the department of Management Studies on his various statements, arguments, and advise on this matter for a course of action.**

The Senate considered the matter and advised that Mr. Veesam Chandra Reddy (Enrl. No.17918020) be asked to submit his thesis within three months and leave the campus following the submission. In case of non-compliance on his part, suitable action be taken against him.

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

07 MAR 2023

Annexure -I

Following were present

1.	Prof. K.K. Pant	Director & Chairman
2.	Prof. U.P. Singh	Dy. Director
3.	Prof. (Mrs.) Milli Pant	Applied Math. and Scientific Computing
4.	Prof. V. Devdas	Architecture & Planning
5.	Prof. Mahua Mukherjee	Architecture & Planning
6.	Prof. Sanjay Ghosh	Biosciences & Bioengineering
7.	Prof. Pravindra Kumar	Biosciences & Bioengineering
8.	Prof. Gopinath Packirisamy	Biosciences & Bioengineering
9.	Prof. Ranjana Pathania	Biosciences & Bioengineering
10.	Prof. Ramasare Prasad	Biosciences & Bioengineering
11.	Prof. Partha Roy	Biosciences & Bioengineering
12.	Prof. Ashwani Kumar Sharma	Biosciences & Bioengineering
13.	Prof. Prakash Biswas	Chemical Engineering
14.	Prof. Amit Kumar Dhiman	Chemical Engineering
15.	Prof. P.P. Kundu	Chemical Engineering
16.	Prof. B. Prasad	Chemical Engineering
17.	Prof. Vimal Chandra Srivastava	Chemical Engineering
18.	Prof. Naseem Ahmad	Chemistry
19.	Prof. R.K. Dutta	Chemistry
20.	Prof. Kaushik Ghosh	Chemistry
21.	Prof. Paritosh Mohanty	Chemistry
22.	Prof. R.K. Peddinti	Chemistry
23.	Prof. Muniappan Sankar	Chemistry
24.	Prof. Anuj Sharma	Chemistry
25.	Prof. Z. Ahmad	Civil Engineering
26.	Prof. Pradeep Bhargava	Civil Engineering
27.	Prof. Anupam Chakrabarti	Civil Engineering
28.	Prof. Rahul Dev Garg	Civil Engineering
29.	Prof. S.K. Ghosh	Civil Engineering
30.	Prof. Bhola Ram Gurjar	Civil Engineering
31.	Prof. Priti Maheshwari	Civil Engineering
32.	Prof. N.K. Samadhiya	Civil Engineering
33.	Prof. Vishwas Sawant	Civil Engineering
34.	Prof. Mahendra Singh	Civil Engineering
35.	Prof. Akhil Upadhyay	Civil Engineering
36.	Prof. R. Balasubramanian	Computer Science & Engineering
37.	Prof. Rajdeep Niyogi	Computer Science & Engineering
38.	Prof. Durga Toshniwal	Computer Science & Engineering
39.	Prof. M.L. Sharma	Earthquake Engineering
40.	Prof. Manish Shrikhande	Earthquake Engineering

07 MAR 2023

41.	Prof. Yogendra Singh	Earthquake Engineering
42.	Prof. G.J. Chakrapani	Earth Sciences
43.	Prof. R. Krishnamurthi	Earth Sciences
44.	Prof. Pramod Agarwal	Electrical Engineering
45.	Prof. B.R. Bhalja	Electrical Engineering
46.	Prof. Mukesh Kumar Pathak	Electrical Engineering
47.	Prof. G.N. Pillai	Electrical Engineering
48.	Prof. Anand Bulusu	Electronics & Communication Engg.
49.	Prof. Sanjeev Manhas	Electronics & Communication Engg.
50.	Prof. N.P. Pathak	Electronics & Communication Engg.
51.	Prof. Amalendu Patnaik	Electronics & Communication Engg.
52.	Prof. (Mrs.) Smita Jha	Humanities & Social Sciences
53.	Prof. Nagendra Kumar	Humanities & Social Sciences
54.	Prof. Binod Mishra	Humanities & Social Sciences
55.	Prof. Sanjit Kumar Mishra	Humanities & Social Sciences
56.	Prof. Sukh Pal Singh	Humanities & Social Sciences
57.	Prof. N.K. Goel	Hydrology
58.	Prof. M.K. Jain	Hydrology
59.	Prof. Himanshu Joshi	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 Chandra	Institute Instrumentation Centre
64.	Prof. Rajat Agarwal	Management Studies
65.	Prof. M.K. Barua	Management Studies
66.	Prof. (Mrs.) Usha Lenka	Management Studies
67.	Prof. Anil Kumar Sharma	Management Studies
68.	Prof. Vinay Sharma	Management Studies
69.	Prof. Sandip Banerjee	Mathematics
70.	Prof. Kusum Deep	Mathematics
71.	Prof. Maheshanand	Mathematics
72.	Prof. Tanuja Srivastava	Mathematics
73.	Prof. A. Swaminathan	Mathematics
74.	Prof. S.P. Yadav	Mathematics
75.	Prof. Navneet Arora	Mechanical & Industrial Engg.
76.	Prof. Akshay Dvivedi	Mechanical & Industrial Engg.
77.	Prof. B.K. Gandhi	Mechanical & Industrial Engg.
78.	Prof. P.K. Jha	Mechanical & Industrial Engg.
79.	Prof. Manish Mishra	Mechanical & Industrial Engg.
80.	Prof. Kaushik Pal	Mechanical & Industrial Engg.
81.	Prof. P.M. Pathak	Mechanical & Industrial Engg.
82.	Prof. Apurbba Kumar Sharma	Mechanical & Industrial Engg.
83.	Prof. Inderdeep Singh	Mechanical & Industrial Engg.

07 MAR 2023

84.	Prof. K.M. Singh	Mechanical & Industrial Engg.
85.	Prof. Indra Vir Singh	Mechanical & Industrial Engg..
86.	Prof. Andallib Tariq	Mechanical & Industrial Engg.
87.	Prof. S.H. Upadhyay	Mechanical & Industrial Engg.
88.	Prof. B.S.S. Daniel	Metallurgical & Materials Engg.
89.	Prof. B.V.M. Kumar	Metallurgical & Materials Engg.
90.	Prof. Vivek Pancholi	Metallurgical & Materials Engg.
91.	Prof. Ujjwal Prakash	Metallurgical & Materials Engg.
92.	Prof. Anjan Sil	Metallurgical & Materials Engg.
93.	Prof. Dharam Dutt	Paper Technology,Saharanpur Campus
94.	Prof. S.C. Sharma	Paper Technology,Saharanpur Campus
95.	Prof. Chayya Sharma	Paper Technology,Saharanpur Campus
96.	Prof. Ajay	Physics
97.	Prof. P. Arumugam	Physics
98.	Prof. (Mrs.) Tulika Maitra	Physics
99.	Prof. Aalok Misra	Physics
100.	Prof. Ghanshyam Das Verma	Physics
101.	Prof. Davinder Kaur Walia	Physics
102.	Prof. Ajay Wasan	Physics
103.	Prof. Kanhaiya Lal Yadav	Physics
104.	Prof. Sujay Chattopadhyay	Polymer Science & Engineering
105.	Prof. Deepak Khare	WRD&M
106.	Prof. Ashish Pandey	WRD&M

107. Prof. Sanjeev Kumar, Head, Institute Computer Centre
108. Prof. Gaurav Manik, Deptt. Of Polymer & Process Engineering
109. Prof. Uttam Kumar Roy, Head of the Centre of Transportation Systems.
110. Prof. Sumit Sen, Head, Centre of Excellence in Disaster Mitigation and Management
111. Prof. Mukesh Kumar Singhal, Department of Hydro & Renewable Energy
112. Prof. M.V.Sunil Krishna, Assoc. DOSW (Students' Activities)
113. Prof. C.N. Ramchandran, ADOAA (Curriculum)
114. Prof. Ramudu, Associate Dean for Corporate Interaction.
115. Dr. C. Jayakumar, Librarian
116. Chairman, SCSP

Students' representatives:

117. Mr Shivansh Bhat, Convener, Students' Affairs Council
118. Mr. Akshay Pandey, General Secretary Academic Affairs (UG)
119. Mr. Abramoni SathwikGeneral Secretary Academic Affairs (PG)

120. Mr. Prashant Garg, Registrar & Secretary, Senate

07 MAR 2023

Annexure –II

The following members conveyed their inability to join the meeting.

1. Prof. Naveen Kumar Nawani, Department of Biosciences and Bioengineering
2. Prof. M.R. Maurya, Department of Chemistry
3. Prof. P.K. Garg, Department of Civil Engineering
4. Prof. Kamal Jain, Department of Civil Engineering
5. Prof Praveen Kumar, Department of Civil Engineering
6. Prof. Rajat Rastogi, Department of Civil Engineering
7. Prof. Sudeb Dasgupta, Department of Electronics & Communication Engineering
8. Prof. D.S. Arya, Department of Hydrology
9. Prof. Premananda Bera, Department of Mathematics
10. Prof. K. Murugesan, Department of Mechanical & Industrial Engineering
11. Prof. Rajdeep Chatterjee, Department of Physics
12. Prof. Vipul Rastogi, Department of Physics

07 MAR 2023

UG CURRICULUM REVISION – 2023

The Proposal (94th Senate)

Dean of Academic Affairs
Indian Institute of Technology Roorkee
Roorkee – 247 667, India

February 22, 2023

1. Background

Revision of academic curriculum periodically is a requirement for an educational institution to keep up with the changing world. The current curriculum of Indian Institute of Technology Roorkee (IIT Roorkee) was reviewed and implemented in the year 2013. Since then, there have been significant developments in science and technology, learning technologies, changes in the academic, research and employment sectors. The announcement of the New Education Policy (NEP-2020) also necessitates to frame a new curriculum that equip the students with the required skills and knowledge to reach out the societal needs.

In compliance to the decision of 71st meeting of IAPC, the Chairman, Senate approved a committee to review the UG Curriculum. The Undergraduate Curriculum Revision Committee (UCRC) notified on 11th February 2020 is as follows:

1)	Dean of Academic Affairs	- Chairperson
2)	Prof. Ram Sateesh Pasupuleti, Architecture & Planning	- Member
3)	Prof. Naveen Kumar Navani, Biosciences and Bioengineering	- Member
4)	Prof. P.K. Jha, Chemical Engg.	- Member
5)	Prof. N.K. Samadhiya, Civil Engg.	- Member
6)	Prof. Manoj Misra, Computer Science & Engg.	- Member
7)	Prof. G.N. Pillai, Electrical Engg.	- Member
8)	Prof. Anand Bulusu, Electronics & Communication Engg.	- Member
9)	Prof. Rajat Agrawal, Management Studies	- Member
10)	Prof. D.K. Dwivedi, Mechanical & Industrial Engg.	- Member
11)	Prof. B.S.S. Daniel, Metallurgical & Materials Engg.	- Member
12)	Prof. Uaday Singh, Mathematics	- Member
13)	Prof. Kalyan K. Sadhu, Chemistry	- Member
14)	Prof. Vipul Rastogi, Physics	- Member
15)	Prof. Kamal, Earth Sciences	- Member
16)	Prof. Binod Mishra, Humanities & Social Sciences	- Member

There were interactions with the Committee and the full UCRC met on 5th - 6th July, 2021 and 4th August, 2021. The Committee considered the views of UG student representative (General Secretary, Academics – UG) also. The UCRC identified the following major philosophies (**STEPS**) as the basis for the revision of the curriculum:

(i) Advancements in Science and Technology
(ii) Employment / Self-employment / Exiting a Program
(iii) Project-based Learning and
(iv) Social Connect

The concepts and visions along with a basic structure of the curriculum were presented before 117th meeting of the Institute Academic Program committee (IAPC) held on February 23, 2022. The modified proposal, after incorporating the suggestions of the IAPC, was placed before the 90th meeting of the Senate held on March 16, 2022.

Senate considered and appreciated the proposal and advised to modify the proposal after considering placement trends, social needs, need for entrepreneurs, project-based education and NEP and the structure of the curriculum in a few sister/global institutions. The Senate suggested a two-phase road map as follows:

i. In the first phase, a proposal only on the structure of the new UG-curriculum (major course baskets, along with their proposed credit ranges) be designed based on the above considerations and placed before the Senate for its consideration and approval.

ii. In the second phase, the department wise detailed curriculum be prepared by the respective departments/centres/school so that it fits into the overall structure approved by the Senate in the first phase.

In the meeting held on November 29, 2022, the UCRC decided to convene an academic curriculum development workshop inviting resource persons from Academia, Industries, Alumni etc. Accordingly, a two-day Workshop on UG Academic Curriculum Development was organized during January 20-21, 2023 to discuss the draft curriculum proposal. The participants and resource persons of the Workshop included eminent academicians, experts from industries from India and abroad, policy makers in government organizations, experts on society connect programs, alumni, student representative, Head of the Departments, Chairpersons of DAPC/CAPC/ScAPC and the members of the UCRC.

The following resource persons contributed to the workshop on specific invitations:

1. Prof. Timothy A. Gonsalves (*Former Director, IIT Mandi, former Professor of Computer Science & Engineering at IIT Madras, founder of Nilgiri Networks (P) Ltd. & co-founder of NMSWorks Software (P) Ltd.*)
2. Prof. S. G. Deshmukh (*Former Director, AVB IIITM Gwalior & Former Deputy Director, IIT Delhi*)
3. Prof. M. K. Tiwari (*Director, NITIE Mumbai & former Dean, Planning and Coordination at IIT Kharagpur*)
4. Prof. Shantanu Roy (*Former Dean of Academics, IIT Delhi*)
5. Prof. Avinash V. Mahajan (*Dean of Academic Programmes, IIT Bombay*)

6. Prof. Vennie Filippas (*Associate Dean for Undergraduate Studies, Virginia Commonwealth University, USA*)
7. Prof. Tarlochan S. Sidhu (*Professor & former Dean, Faculty of Engineering and Applied Sciences at Ontario Tech University, Canada*)
8. Dr. Anjan Ray (*Director, Indian Institute of Petroleum (IIP) Dehradun*)
9. Prof. Virendra Kumar Vijay (*IREDA Chair Professor at IIT Delhi & National Coordinator, Unnat Bharat Abhiyan, Govt. of India*)
10. Dr. Anita Aggarwal (*Head, Technology Development and Transfer (TDT), DST, New Delhi*)
11. Dr. Sanjiv Kumar (*Google Fellow, VP, Google Research, USA & former Visiting Professor at Columbia University, USA*)
12. Mr. Ajoy Mandal (*Texas Instruments, Bangalore, Alumnus IIT Kharagpur*)
13. Mr. Vipul Arora (General Manager, *ITC, Haridwar, Alumnus IIT Roorkee*)
14. Prof. Kaushik Pal (*Professor-In-Charge, Placement & Internship Cell, IIT Roorkee*)
15. Mr. Abramoni Sathwik (*General Secretary, (Academics Affairs)-UG, IIT Roorkee*)

Post discussion in the Workshop, a revised structure of the UG Curriculum was drawn up and placed in 127th IAPC held on February 1, 2023. IAPC suggested minor modification in the proposal.

2. Proposed Structure of the UG Curriculum

The revised structure of the Curriculum is presented in the subsequent sections.

Table 1. Structure of 4-Year B.Tech. Programs

Main Curriculum components	Type of Courses	Credits to be earned from different components	Minimum credits to be earned from different groups	Remarks
Institute Core Courses (ICC)	Humanities and Social Science Courses (HSSC)	5	**52-58**	• Soft Skills- 03 credit (HSI-101); 1st sem • Indian Knowledge System (IKS-101) - 02 credit; 2nd sem
	Humanities and Social Science Elective Courses (HSSEC)	6		• 2 courses from the HSS baskets (HSI-XXX & HSI-XXX)
	Management Courses (MC)	3		• Fundamental course on management (MSI-101)
	Basic Science Courses (BSC)	12*- 20		• **Mathematics** - Minimum 08* credits mandatory and 04 credits optional: - One course common to all in 1st sem (eg; MAB-101) - One Statistics & Linear Algebra based course common to all in 2nd sem (foundation for DS and AI/ML courses)- (MA**B**-102) - One Deptt. specific mathematics course in 3rd sem (Optional) • **Physics**- 04* credits mandatory course common to all in 1st sem (PHB-101)
	Engineering Science Courses (ESC)	8-20		• For interdisciplinary exposure • To be taken from other engineering departments
	Data Science Course (DSC)	4		• Mandatory course common to all in 2nd sem
	Engineering and Sustainable Science Course (ESSC)	3		• The following group of departments to offer one course on environmental and sustainability aspects related to their discipline, jointly/ on rotation basis: (i) CE, AR, ES (ii) EE, ECE, CSE, PH, DS, MA (iii) CY, CH, BSBE, HSS (iv) ME, MT
	Tinkering & Mentoring (TM)	4		• 1st sem. • Details provided in the notes below

Program Core Courses (PCC)	Class Contact Core Courses	40-48	**87 -91**	
	Fundamentals of AI/ ML	2		• Department centric course to be offered in the 3rd year (may be in Hybrid mode too)
	Engineering Analysis and design (Design Thinking based project)/ Industry Oriented Problem Solving/ Lab-based Projects/ Practical Problems/ Case Study	4		• Students be encouraged to take up live problems from industry/field • Product design projects be given preference
	Technical Communication	2		• Department specific course (may be offered in association with the Dept. of HSS/External experts)
	BTP/ Entrepreneurship / Project-based Internship #/ PEC	6-10		• The Deptt/Centre/School to decide based on the applications/choices of the students at the end of the 6th semester # Project-based Internship shall be credited (Not to be counted in NCE)
Program Elective Courses (PEC)	Program Elective Courses	22-26		• PECs can be from other than the parent the Deptt/Centre/School subject to the approval of the concerned DAPC/CAPC/ScAPC.
Talent Enhancement Basket (TEB)	Talent Enhancement Basket (TEB)	6-8		• Departments will create bucket(s) of skill development programs in relevant areas pertaining to their specializations • Students may choose such courses to attain skill in a focused area, for example – 3D printing, material characterization, algorithm design, deep learning, supply chain management, cognitive psychology etc. • 2nd / 3rd Yr (Practical-oriented course)
Open Elective Courses (OEC)	Open Elective Courses (OEC) [IITR / Institutes across the globe*]	9-12	9-12	• (*) Departments will identify such courses and universities/institutes across the globe from which credit transfer may be allowed
Community Outreach (CORE)	Community Outreach (CORE)	2	2	• To provide/create opportunities for students to work with the society in the form of community development project/rural upliftment of the underprivileged etc. • This may also be done in association with NGOs, local government bodies, boot camps etc., if required. • Departments may develop its evaluation strategy.
Total Credits to be earned: 150-160				

07 MAR 2023

	Components	Maximum Units	Minimum Units	Comments
Non-Credit Elements (NCE)	Discipline (DIS)	16	8	To be evaluated by DoSW
	NCC/NSS/NSO	8	4	To be evaluated by DoSW
	Internship (INT)	24	8	1 week internship= 1 unit (to be coordinated by the deptt. /centres/school)
	Participation in professional development programs by Industry experts / field experts (PPD-1 & PPD-2)	8	4	To be coordinated by the departments/centres/school (2nd & 3rd Years)
Minimum non-credit units to be earned: 24				
Minor Specialization Courses (MSC)*/ Department Honor Courses (DHC)			18-20	Departments may suggest theme based minor specialization courses independently and/or jointly with other departments

Table 2. Structure of 5-Year Int. M. Tech., BS-MS and B. Arch. Programs *(for remarks, see the table above)*

Curriculum components and suggested ranges		Int. M.Tech.		BS-MS		B.Arch.	
Institute Core Courses (ICC)	HSSC	5	52-58	5	52-58	5	52-58
	HSSEC	6		6		6	
	MC	3		3		3	
	BSC	12 -20		12 -28		12 -20	
	ESC	8-20		8-20		8-20	
	ESSC	3		3		3	
	DSC	4		4		4	
	TM	4		4		4	
Program Core Courses (PCC)	Class Contact Core Courses	52-62	127-133	52-62	127-133	**TBD**	127-133
	Fundamentals of AI/ML	2		2		2	
	Eng. Anal & Design (Design Thinking based project) / Industry Oriented Problem/Lab-based Projects/Practical Problems/Case Study	4		4		**TBD**	
	Tech. Communications	2		2		2	
	Thesis	16		16		**TBD**	
Program Elective Courses (PEC)	PEC	32-40		32-40		**TBD**	
Talent Enhanced Basket (TEB)	TEB	6-8		6-8		6-8	
Open Elective Courses (OEC)	OEC	9-12	**9-12**	9-12	**9-12**	9-12	**9-2**
Community Outreach	CORE	2	**2**	2	**2**	2	**2**
Total Credits to be earned: 190-200							

	Components	Maximum	Minimum	Comments
Non-Credit Elements (NCE)	Discipline (DIS)	20	10	• To be evaluated by DoSW
	NCC/NSS/NSO	8	4	• To be evaluated by DoSW
	Internship (INT)	32	10	• 1-week internship= 1 unit • (To be coordinated by departments/centres/school)
	Participation in professional development programs by Industry experts/ field experts (PPD -1, PPD-2 & PPD-3)	12	6	• To be coordinated by departments/centres/school (2^{nd}, 3^{rd} and 4^{th} Years)
Minimum non-credit to be earned: 30				
With MSC/DHC (Additional 18-20 credits)		**208-220**	**208-220**	**208-220**

Table 3. Tinkering and Mentoring

(Semester long course to be evaluated on continuous evaluation mode as per the following scheme)

To be coordinated by an Institute level Coordinating Committee (3-4 members each for Tinkering and Mentoring)		
	(A) Tinkering# • Objective- To develop interest in project-based learning. • Guidance- Faculty members of the parent departments/centre/school • Facilities- All departmental & central facilities like tinkering lab, IIC, ICC, workshops etc.	**(B) Mentoring** • Objective- To create awareness on relevant concepts on professional/career development.
Components	Tinkering and Learning: Project based course to nurture creative abilities of students	Ethics, IPR, Entrepreneurship, Standardization
Weightage	50%	50%

Notes#:

i. May have projects (individual/common to all students) in coordination with DIC/ReThink Tinkering Lab or other central facilities.

ii. May have department/centre/school level projects (considering branch change possibility, multidisciplinary projects be encouraged).

iii. The committee will coordinate with the concerned departments/centres/school regarding all aspects i.e. formulation, execution, evaluation and logistics of the projects.

3. Semester wise Plan

Table 4. First Year: Autumn Semester

Sl. No	Course Code	Course Name	Type	Credit
1.	HSI-101	Soft Skills	HSSC	3
2.	MAI-101	Mathematics-1	BSC	4
3.	PHI-101	Physics-1	BSC	4
4.	DXP-103	Computer Programming (Dept. Specific)	PCC	4
5.	TMI-101	Tinkering and Mentoring	TMI	4
6.	DXE-xxx	To be taken from other engineering departments	ESC	4
			Total	23

Table 5. Other Semesters

Year	Semester	Course Types			Remarks
First	Spring	**HSSC (IKS), 1 BSC (Stat & LA), ESSC,** *BSC/ESC/ PCC*			• Departments to distribute the courses of different components given in italics as per their choice within 24 credits per semester • **HSSECs, MC & DSC:** **Batch A**- AR, BE, CE, CH, CSE, ECE, EE, EPH, BSMS-CY & BSMS-PH **Batch B -** GPT,GT,ME,PI, MT, BSMS-ECO, BSMS-MA & MFS
Second	Autumn	**1st HSSEC (Batch A), 1st OEC, MC (Batch A), DSC (Batch B),** *BSC/ESC/ PCC/PEC/TEB*			
	Spring	**1st HSSEC (Batch B),2nd OEC, MC (Batch B), DSC (Batch A),** *BSC/PCC/PEC/TEB/ ESC/CORE*			
Third	Autumn	**2nd HSSEC (Batch A), 3rd OEC, AI/ML (PCC),** *PCC/PEC/TEB/CORE*			
	Spring	**2nd HSSEC (Batch B), MSC/DHC,** *PCC/PEC/TEB/CORE*			
Fourth	Autumn	*for B. Tech.*	Project/Entrepreneurship**/ Project-based Internship**/PEC**, **MSC/DHC**	***PCC,PEC, MSC/DHC**	* for BS-MS, IMT and B. Arch. Programs ** Subject to the approval by the Deptt./Centre/School
	Spring		Project/Entrepreneurship**/Project-based Internship**/PEC**, **MSC/DHC**	***PCC,PEC, MSC/DHC**	
Fifth	Autumn	Thesis Stage – I			
	Spring	Thesis Stage – II			

4. Salient Features

a. Following new courses/ course categories have been introduced:

- i. Data Science
- ii. Fundamentals of AI/ML
- iii. Indian Knowledge System (IKS)
- iv. Mandatory course on management
- v. Engineering and Sustainable Science Course (ESSC)

New Courses

- vi. Tinkering & Mentoring
- vii. Talent Enhancement Basket
- viii. Design Thinking based project.
- ix. Community Outreach (CORE)
- x. Theme based minor specialization.

New Course Categories

b. Project is optional for the student in four-year programs. The equivalent credits of Project may be earned through Internship/ Entrepreneurship/ additional PECs in 1-2 semesters subject to the approval by the departments/centres/school.
c. One of the semesters in the final (fourth/fifth) year **may be planned without any other course work** for the students who will carry out projects/internships/entrepreneurship outside IITR.
d. Departments/centres/school to distribute the courses across the semesters in view of exit option.
e. Non-Credit Elements (NCE) have been introduced; will be evaluated throughout the program.
f. Additional OECs have been added in the structure.

5. **Others**

a. Departments/centres/school may select components within the range suggested.
b. PCC and PEC credits may be decided as per the requirement of the program/departments/centres/school within the limits of the total credits.
c. All departments/centres/school to offer minimum three ESC/BSC courses and two OEC courses each to the respective baskets. BSBE to contribute to both ESC and BSC baskets.
d. DSC course to be offered by the Mehta Family School of Data Science and Artificial Intelligence (MFS).
e. Once the basic structure is approved, the BSC/ESC/OEC/ESSC courses to be offered by the departments/centres/school be provided for approval of the department wise structure by the Senate.
f. In view of the fast-changing technological scenarios in industries and business operations, departments/centers/schools are suggested to offer more courses based on Artificial Intelligence (AI), Data Science (DS), Big-Data Analysis (BDA), Machine Learning (ML) etc.

6. **Future actions:**

a. The Senate to consider the proposal.
b. Approved basic structure of the curriculum will be sent to the departments/centres/school for preparing the detailed structure.
c. The academic departments/centres/school to decide the department wise course structure & syllabi through due deliberations (with stake-holders for example- current students, alumni, peer institutions/departments/ centres, employers etc.) for approval of IAPC/Senate.
d. Implementation of the revised UG-Curriculum w.e.f. Academic Year 2023-24.

7. **Some of the suggested Course Codes:**

Course Category	Institute Core Courses				Basic Science (BSC)	Engineering Science (ESC)	Open Elective (OEC)	Program Core (PCC)	Program Elective (PEC)	Environmental & Sustainability Science (ESSC)	Project (PROJ)
	HSS (HSSC)	Management (MC)	Tinkering & Mentoring (TM)	Data Science (DSC)							
Example Codes	HSI-101	MSI-101	TMI-101	DSI-101	MAB-101 MAB-102 PHB-101 BSB-101 CYB-101 ESB-101 PHB-102	ARE-101 BSE-101 CEE-101	ARO-101 BSO-101 CEO-101	ARC-101 BSC-101 CEC-101	ARL-101 BSL-101 CEL-101	ESS-101 ESS-102 ESS-103 ESS-104	BTP-4xx BSP-4xx MSP-4xx IMTP-5xx ARP-5xx

****

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX** **M.Tech. (Semiconductor Technology)**
Department: **EC** **Department of Electronics and Communication Engineering**
Year: **I**

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
Semester- I (Autumn): @ IIT Roorkee														
1.	PHN-709	Semiconductor Device Physics	PCC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	ECN-573	Digital VLSI Circuit Design	PCC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	ECN-5XX	High Frequency Analog Integrated Circuits	PCC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	PHN-7XX	Semiconductor Characterization Lab	PCC	2	0	0	6	0	6	-	50	-	-	50
5.	ECN-5XX	Microelectronics Fabrication Lab-1	PCC	2	0	0	3	0	3	-	100	-	-	-
6.	PHN-724	Semiconductor Micro-electronic Technology	PCC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
		Total		**20**										
Semester-II (Spring): Partner University student → @ IIT R / **IIT-R student → @ Partner University**														
1.	ECN/PHN-700	Seminar	SEM	2	-	-	-	-	-	-	-	-	100	-
2.		Program Elective-I	PEC	4	-	-	-	-	-	-	-	-	-	-
3.		Program Elective-II	PEC	4	-	-	-	-	-	-	-	-	-	-
4.		Program Elective-III	PEC	4	-	-	-	-	-	-	-	-	-	-
5.		Program Elective-IV	PEC	4	-	-	-	-	-	-	-	-	-	-
6.		Program Elective-V	PEC	2	-	-	-	-	-	-	-	-	-	-
		Total		**20**										
Courses to be chosen from partner university with total credits **20**														

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code: **XXX M.Tech. (Semiconductor Technology)**
Department: **EC Department of Electronics and Communication Engineering**
Year: **II**

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
Semester- I (Autumn): Partner University student → @ IIT R / **IIT-R student → @ Partner University**														
1.	ECN-701A	Thesis Stage-I (to be continued next semester)	DIS	12	-	-	-	-	-	-	-	-	100	-
		Total		**12**										
Note: Students can take 1 or 2 audit courses as advised by the supervisor, if required.														
Semester-II (Spring): @ IIT Roorkee														
1.	ECN-701B	Thesis Stage-II (continued from III semester)	DIS	18	-	-	-	-	-	-	-	-	100	-
		Total		**18**										

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	20	20	12	18
Total Credits	**70**			

Program Elective Courses for M.Tech. (Semiconductor Technology)

Program Elective Course Basket: List of PECs (Physics)

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	PHN-601	Advanced Condensed Matter Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
2.	PHN-603	Advanced Atmospheric Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
3.	PHN-605	Advanced Laser Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
4.	PHN-607	Advanced Nuclear Physics	PEC	4	3	0	3	3	0	20	20	20	40	0
5.	PHN-602	Nuclear Astrophysics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	PHN-604	Physics of Nanosystems	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
7.	PHN-606	Superfluidity and Superconductivity	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
8.	PHN-608	Fiber and Nonlinear Optics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
9.	PHN-610	Quantum Optics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
10.	PHN-612	Advanced topics in Mathematical Physics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
11.	PHN-614	Introduction to Superstring theory	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
12.	PHN-616	Advanced Electroceramics Technology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
13.	PHN-617	Advanced Characterization Techniques	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
14.	PHN-618	Atomic and Molecular Collision Physics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
15.	PHN-619	A Primer in Quantum Field Theory	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
16.	PHN-620	Advanced Quantum Field Theory	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
17.	PHN-621	Astrophysics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
18.	PHN-622	Solar Terrestrial Physics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

19.	PHN-623	General Relativity	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
20.	PHN-624	Computational Nuclear Physics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
21.	PHN-625	Particle Physics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
22.	PHN-626	Advanced Atomic and Molecular Physics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
23.	PHN-627	Quantum Theory of Solids	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
24.	PHN-629	Weather Forecasting	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
25.	PHN-631	Nuclear Instrumentation	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
26.	PHN-633	Physics and Technology of Thin Films	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
27.	PHN-635	Advanced Nuclear reactions	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
28.	PHN-637	Semiconductor Photonics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
29.	PHN-638	Advanced Light Sources	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
30.	PNN-639	Superconducting Radio Frequency for particle accelerators	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
31.	PHN-715	Analog Integrated Circuit Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
32.	PHN-717	Digital Signal Processing	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
33.	PHN-713	Optical Electronics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

List of PECs (Physics): Solid State Electronic Materials

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	PHN-715	Analog Integrated Circuit Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	PHN-717	Digital Signal Processing	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	PHN-713	Optical Electronics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	PHN-718	Thin Film Technology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

5.	PHN-708	Materials for Renewable Energy and Storage	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	PHN-722	Functional Properties of Materials & Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
7.	PHN-721	Nanoscience and Nanotechnology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
8.	PHN-723	Engineered materials for Device Application	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
9.	PHN-724	Semiconductor Micro-electronic Technology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
10.	PHN-725	Nano-electronics and photonics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
11.	PHN-726	Solar Photovoltaic and Energy Storage	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
12.	PHN-727	Advance Fuel Cell and Battery Technology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
13.	PHN-728	MEMS and NEMS	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
14.	PHN-729	Advanced Ceramics and Composites	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

List of PECs (Physics): Photonics

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	PHN-709	Semiconductor Device Physics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	PHN-715	Analog Integrated Circuit Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	PHN-717	Digital Signal Processing	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	PHN-719	Radiation Detection and Measurements	PEC	4	3	0	3	3	0	10-25	25	15-25	30-40	0
5.	PHN-725	Nano-electronics and photonics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	PHN-726	Solar Photovoltaic and Energy Storage	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
7.	PHN-731	Optical Communication System	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
8.	PHN-732	Optical Networks	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

9.	PHN-733	Solid State Lighting	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
10.	PHN-734	Display Technology	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
11.	PHN-735	Photonic Sensors	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
12.	PHN-736	Photonic Analysis and Design	PEC	4	2	0	4	2	3	10-25	25	15-25	30-40	0
13.	PHN-737	Silicon Photonics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
14.	PHN-738	Quantum Photonics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

List of PECs (ECE): Microelectronics & VLSI

Teaching Scheme					Contact Hours/Week			Exam Duration		Relative Weight (%)				
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical	CWS	PRS	MTE	ETE	PRE
1.	ECN-524	Power Electronic Devices, Circuits and Systems	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
2.	ECN-525	Hardware Architecture for Deep-Learning	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
3.	ECN-526	Statistical Machine Learning for Variation-Aware Electronic Device and Circuit Simulation	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
4.	ECN-561	Compact Modeling of Semiconductor Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
5.	ECN-571	Semiconductor Device Modeling	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
6.	ECN-572	MOS Device Physics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
7.	ECN-581	Analog VLSI Circuit Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
8.	ECN-582	Semiconductor Microwave Devices & Applications	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
9.	ECN-583	Optoelectronic Materials & Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
10.	ECN-584	Mixed Signal Circuit Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
11.	ECN-585	VLSI System Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

12.	ECN-586	Device & Circuit Interaction	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
13.	ECN-587	Nano Scale Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
14.	ECN-588	Performance and Reliability of VLSI Circuits	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
15.	ECN-589	Advanced VLSI Interconnects	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
16.	ECN-590	Organic Electronics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
17.	ECN-591	VLSI Physical Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
18.	ECN-592	Compound Semiconductors and RF Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
19.	ECN-593	CAD for VLSI	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
20.	ECN-594	VLSI Digital Signal Processing	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
21.	ECN-595	VLSI Testing and Testability	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
22.	ECN-596	MEMS and NEMS	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
23.	ECN-597	Microelectronics Lab.-2	PEC	2	-	-	2	-	-	-	100	-	-	-
24.	ECN-598	Simulation Lab.-2	PEC	2	-	-	2	-	-	-	100	-	-	-
List of PECs (ECE): Terahertz Communication and Sensing														
25.	ECN-554	Microwave and Millimeter-Wave Circuits	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
26.	ECN-603	Millimeter-Wave & Terahertz Antenna Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
27.	ECN-604	High Speed Semiconductor Devices	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
28.	ECN-605	Surface Electromagnetics	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
29.	ECN-637	Microwave Photonic ICs	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
30.	ECN-542	Microwave Integrated Circuits	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
31.	ECN-557	RF Power Amplifier and Transmitter Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
32.	ECN-548	RF & Microwave MEMS	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
33.	ECN-549	RF CMOS Transceiver Design	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-
34.	ECN-638	RF Integrated Circuit Design for mmWave Radio	PEC	4	3	1	0	3	0	20-35	-	20-30	40-50	-

National Yang Ming Chiao Tung University (NYCU)	
NYCU-01	Terahertz Systems
NYCU-02	Digital Signal Processing for Communication Systems
NYCU-03	Reliability and Failure Physics of Semiconductor Devices
NYCU-04	Semiconductor Physics and Devices (I)
NYCU-05	Digital Integrated Circuits
NYCU-06	Semiconductor Material and Device Characterization
NYCU-07	Introduction to Solid State Physics
NYCU-08	Quantum Fluids and Cryogenics
NYCU-09	Analog Circuit Design II
NYCU-10	Advanced Compound Semiconductors and Their Applications
NYCU-11	Semiconductor Optoelectronics
NYCU-12	Semiconductor Processings
NYCU-13	2D nanoelectronics: Materials, Physics, and Applications
NYCU-14	Electrochemical Energy Storage Materials
NYCU-15	Introduction to Monte Carlo Method: Simulation and Application
NYCU-16	From Fundamentals of Semiconductor Devices to Nanometer-Scale CMOS Transistors
NYCU-17	Special Topics of Semiconductor Devices:Fabrication, Characterization, and Applications
NYCU-18	Selected Topics in Advanced Nano Electronics
NYCU-19	Semiconductor Engineering
NYCU-20	Mechanical Behaviours of Materials
NYCU-21	Simulation of Electronic Devices and Basics of Quantum ATK
NYCU-22	Engineering Design
NYCU-23	Electronic Devices and Low-frequency Noise
NYCU-24	Introduction to Waveguides and Component Design
NYCU-25	VLSI Digital Signal Processing
NYCU-26	Semiconductor Physics and Devices (I)
NYCU-27	Memory Circuits and System
NYCU-28	More Than Moore Devices
NYCU-29	Analog Circuit Design
NYCU-30	Electron transport in low-dimensional systems and memories concepts
NYCU-31	Introduction to Photovoltaics
NYCU-32	Principles and Applications of Materials Characterization Techniques
NYCU-33	Introduction to Radiation Effects in Electronics
NYCU-34	Introduction to two-dimensional materials and systems
NYCU-35	Frontier Research in Quantum Fluids - Helium Physics
NYCU-36	Electrical Ceramics and Packaging Technology
NYCU-37	Intro. to Compound Semiconductor Device & Process
NYCU-38	Introduction to Amplifier Design for Radio-Frequency Communication Applications

07 MAR 2023

NYCU-39	Selected Topics in Low-Dimensional Electronic Devices
NYCU-40	Power semiconductor devices: Device design, Characteristics, and Reliability
NYCU-41	Advanced Electronic Materials Science & Engineering
NYCU-42	Radiation Effects in Electronics
NYCU-43	Advanced Compound Semiconductors and Their Applications
NYCU-44	Technology Management and Practice of System Engineering (SE)
NYCU-45	Semiconductor and Energy
NYCU-46	SEMINAR
NYCU-47	ACADEMIC DISSERTATION RESEARCH

National Tsing Hua University (NTHU)	
SEMICONDUCTOR PHYSICS	
NTHU-01	The Introduction to Semiconductor Devices
NTHU-02	VLSI Devices Pyhsics
NTHU-03	Nano-Scale MOSFET Device Pyhsics
NTHU-04	Three Dimensional MOSFET and Device Physics
NTHU-05	Quantum Computation and Qubit Devices
NTHU-06	MEMS System Design
NTHU-07	Nanosystem Sensor and Actuation
NTHU-08	Electronic Nano Biomedical Sensor
NTHU-09	Semicon. Memory, Manufac. & App
NTHU-10	Semiconductor Memories
NTHU-11	Logic Non-volatile Memories
NTHU-12	3D and Next Generation Memories
NTHU-13	Artificial Neuromorphic Synapse and Memory Computing Device
NTHU-14	CMOS Image Sensor
NTHU-15	Semiconductor Light Detector and Circuit
NTHU-16	Compound Power Semiconductor Devices
NTHU-17	Semicondcutor Power Devices
NTHU-18	Semiconductor Device Design
NTHU-19	Semiconductor Device Measurement
NTHU-20	Semicondcutor Device Design and Simulation
SEMICONDUCTOR DESIGN	
NTHU-21	VLSI System Design
NTHU-22	Timing Circuit Designs & Applications
NTHU-23	VLSI Design
NTHU-24	Computer Arithmetic
NTHU-25	Memory Systems
NTHU-26	Advanced Computer Architecture
NTHU-27	Implementation of Many-Core Systems

07 MAR 2023

NTHU-28	Design tools
NTHU-29	Design automation
NTHU-30	VLSI Design for Manufacturability
NTHU-31	Advanced Digital Design and Verification
NTHU-32	FPGA Architecture & CAD
NTHU-33	Introduction to quantum computing
NTHU-34	VLSI Physical Design Automation
NTHU-35	VLSI Design Automation
NTHU-36	VLSI Testing
NTHU-37	Embedded Memory Circuit Design
NTHU-38	Analog Circuit Design
NTHU-39	VLSI Design
NTHU-40	RF IC Design
NTHU-41	Wireline Communication IC
NTHU-42	Biomimetic VLSI Design
NTHU-43	Analysis & Design of Microwave Circuits
NTHU-44	AI and Signal Processing
NTHU-45	Machine Learing
SEMICONDUCTOR MATERIAL	
NTHU-46	Kinetic Process of Materials
NTHU-47	Thermodynamics of Solid State
NTHU-48	Electrochemical Analytical Techniques and Applications
NTHU-49	Inspection and Analysis for Materials
NTHU-50	Instrumental Analysis and Lab.(II)
NTHU-51	Transmission Electron Microscopy
NTHU-52	Advanced Polymer Chemistry
NTHU-53	Molecular Engineering (I)
NTHU-54	IC metalsand conductors for IC
NTHU-55	2D materials
NTHU-56	Materials computation and simulations
NTHU-57	Molecular Dynamics Simulations
NTHU-58	materials for spintronics
SEMICONDUCTOR PROCESS	
NTHU-59	RET、Immersion、EUV Semiconductor Lithography
NTHU-60	Optical Proximity Correction
NTHU-61	Lithography Process and Control
NTHU-62	Scanner, track, & Metrology Equipment
NTHU-63	Lithography Mask
NTHU-64	Plasma Engineering & Applications
NTHU-65	Microwave Engineering
NTHU-66	Thin Film Physics and Technologies
NTHU-67	Plasma Physics

07 MAR 2023

NTHU-68	Insp & Anals for Materials
NTHU-69	Analytical techniques for Materials Chemistry
NTHU-70	Synchrotron app in structural anal
NTHU-71	Nano-scale Optical Metrology & App
NTHU-72	Fundamental Mechanics of Electronic Packaging
NTHU-73	Optimum Structural Design
NTHU-74	Electronic Packaging technology & materials
NTHU-75	Reactive Ion Etching
NTHU-76	Ion Implantation
NTHU-77	Electron-Beam Inspection
NTHU-78	Chemical Vapor Deposition
NTHU-79	Atomic Layer Deposition

National Taiwan Normal University (NTNU)	
NTNU-01	Quantum Mechanics (I)
NTNU-02	Quantum Mechanics (II)
NTNU-03	Classical Electrodynamics (I)
NTNU-04	Seminar
NTNU-05	Introduction to Semiconductor Physics (I)
NTNU-06	Introduction to Semiconductor Physics (II)
NTNU-07	Modern Advanced Materials and Optoelectronics (I)
NTNU-08	Modern Advanced Materials and Optoelectronics (II)
NTNU-09	Solar Cells Principles and Practices
NTNU-10	Topics on Two Dimensional Quantum Materials (I)
NTNU-11	Topics on Two Dimensional Quantum Materials (II)
NTNU-12	Introduction to Novel Nano-Materials
NTNU-13	Introduction to Energy Materials

07 MAR 2023

Seat Matrix for M.Tech./M.Arch./MURP Admission 2023-24

S.No	Academic Department/ Centre & (Code)	Academic Programmes	Code	Main Gate Discipline(s)					Other GATE Disciplines					EWS 10%	PD 5% horizontal	Spl. Wise intake	Total seats in Dept/Centre
		Name		GATE Discipline Code	UR	OBC	SC	ST	GATE Discipline Code	UR	OBC	SC	ST				
1	Architecture and Planning (ARD)	M.Arch.	10	AR(12)	5	4	2	1	-					1	1	13	26
		M.U.R.P.	11	AR(10)	4	3	2	1	CE(2)	1	1	0	0	1		13	
2	Hydro and Renewable Energy (HRE)	M.Tech. Renewable and Hydro Energy	12	CE(2)	1	1	0	0	AG/CH/EE/EC/ME/PI/XE/IN (10*)	7	5	3	2	2	2	21	32
		M.Tech. Environmental Management of Rivers and Lakes	13	CE(3)	1	1	1	0	AG/CH/EE/ME/PI/ XE/AR/CY/BT/PH/MA/XL/EY/ES(7)	3	2	1	1	1		11	
3	Chemical Engineering (CHD)	M.Tech.Chemical Engineering	14	CH(45)	20	13	8	4	-					5	3	50	50
4	Civil Engineering (CED)	M.Tech. Environmental Engg.	16	CE(10)	4	3	2	1	CH(2)	1	1	0	0	1	5	13	91
		M.Tech. Geospatial Engg.	17	CE/GE(9)	4	3	1	1	AR/CS/EC/EE /AG/MN(4)	2	1	1	0	1		14	
		M.Tech. Geotechnical Engg.	18	CE(12)	6	3	2	1	MN (2)	1	1			2		16	
		M.Tech. Hydraulic Engg.	19	CE(11)	5	3	2	1						1		12	
		M.Tech. Structural Engg	20	CE(21)	9	6	4	2	-					2		23	
		M.Tech. Transportation Engg.	21	CE(12)	6	3	2	1	-					1		13	
5	Earthquake Engineering (EQD)	M.Tech. Soil Dynamics	22	CE(11)	5	3	2	1	-					1	2	12	41
		M.Tech. Structural Dynamics	23	CE(17)	8	5	3	1	-					2		19	
		M.Tech. Seismic Vulnerability and Risk Assessment	24	CE(9)	4	3	1	1	-					1		10	
6	Electrical Engineering (EED)	M.Tech. Electric Drives & Power Electronics	25	EE(13)	6	4	2	1	-					2	4	15	75
		M.Tech. Instrumentation and Signal Processing	26	EE(9)	4	3	1	1	EC/IN(4)	2	1	1	0	2		15	
		M.Tech. Power System Engg.	27	EE(13)	6	4	2	1	-					2		15	
		M.Tech. Systems and Control	28	EE(10)	4	3	2	1	EC/IN(3)	1	1	1	0	2		15	
		M.Tech. Electric Vehicle Technology	56	EE(13)	6	4	2	1	-					2		15	
7	Electronics and Communication Engineering (ECD)	M.Tech. Communication Systems	29	EC(11)	5	3	2	1	-					1	3	12	69
		M.Tech. R.F. & Microwave Engg	30	EC(10)	5	3	1	1	-					1		11	
		M.Tech. Microelectronics and VLSI	31	EC/PH(10)	4	3	2	1	-					1		11	
		M.Tech. Terahertz Communication and Sensing	58	EC(10)	4	3	2	1	PH/EE(8)	4	2	1	1	2		20	
		M.Tech. Semiconductor Technology	59	EC/PH(11)	5	3	2	1	EE/IN (2)	1	1	0	0	2		15	
8	Computer Science and Engineering (CSD)	M.Tech. Computer Science & Engg	32	CS(29)	13	9	5	2	-					3	2	32	32
9	Hydrology (HYD)	M.Tech. Hydrology	33	CE/AG(17)	8	5	3	1	GG/XE/PH/ EY(3)	1	1	0	1	2	1	22	22
10	Mechanical and Industrial Engineering (MED)	M.Tech. CAD, CAM & Robotics	34	ME/PI(12)	5	4	2	1	-					1	4	13	70
		M.Tech. Machine Design Engg.	35	ME/PI(13)	6	4	2	1	-					1		14	
		M.Tech. Production & Industrial Systems Engg.	36	ME/PI(13)	6	4	2	1	-					2		15	
		M.Tech. Thermal Engg.	37	ME/PI(13)	6	4	2	1	-					2		15	
		M.Tech. Additive & Joining Technologies	38	ME/PI(12)	5	4	2	1	-					1		13	
11	Metallurgical and Materials Engineering (MTD)	M.Tech. Industrial Metallurgy	39	MT(3)	2	1	0	0	AE/BT/CH/CY/ES/ME/MN/PH/PI/TF/XE (7)	3	2	1	1	1	1	11	23
		M.Tech. Materials Engg.	40	MT(4)	2	1	1	0	AE/BT/CH/CY/ES/ME/MN/PH/PI/TF/XE (7)	3	2	1	1	1		12	
12	Paper Technology Saharanpur Campus (PPD)	M.Tech. Pulp & Paper Technology	41	CH(7)	3	2	1	1	ME/BT/TF/EY (5)	2	2	1	0	1	1	13	26
		M.Tech Packaging Technology	42	CH(6)	2	2	1	1	BT/CY/ME/TF (6)	3	2	1	0	1		13	
13	Water Resources Development and Management (WRD)	M.Tech. Irrigation Water Management	43	CE/AG(7)	3	2	1	1	-					1	2	8	31
		M.Tech. Water Resources Development	44	CE/EE/ME (12)	5	4	2	1	-					1		13	
		M.Tech. Drinking Water and Sanitation	45	CE/AG/ES/AR/CH/ME(9)	4	3	1	1	-					1		10	
14	Physics (PHD)	M.Tech. Solid State Electronic Materials	46	PH(7)	3	2	1	1	EE/EC/MT (3)	1	1	1	0	1	1	11	22
		M.Tech. Photonics	47	PH(7)	3	2	1	1	EE/EC/MT/IN (3)	1	1	1	0	1		11	
15	Nanotechnology (NTC)	M.Tech. Nanotechnology	48	MT/ME/EC/CH/BT/ CE (4)	2	1	1	0	CY/PH/XL (6)	2	2	1	1	1	1	11	11
16	Disaster Mitigation and Management (DMC)	M.Tech. Disaster Mitigation and Management	49	CE(5)	2	1	1	1	ME/PI/CS/CH/AR/GG/PH/MA/XL/XE/EY /BT/GE (13)	6	4	2	1	2	1	20	20
17	Transportation Systems (TSC)	M.Tech. Infrastructure Systems	50	CE(3)	1	1	1	0	ME/PI/CH/EE/EC/CS/ AR (7)	3	2	1	1	1	1	11	11
18	Biosciences and Bioengineering (BBD)	M.Tech. Bioprocess Engineering	51	CH (4)	2	1	1	0	BT/AG/XE/TF (6)	2	2	1	1	1	1	11	11
19	Polymer and Process Engg (PPE)	M.Tech. Polymer Science and Engg	52	CH/XE(12)	5	4	2	1	CY/ME/PE/PI/TF (8)	4	2	1	1	2	1	22	22
20	Mehta Family School of Data Science and Artificial Intelligence (MFS)	M.Tech. Artificial Intelligence	53	CS/EC/EE (13)	6	4	2	1	MA/CE/IN/ME/PH/ST/GE(5)	2	1	1	1	2	2	20	40
		M.Tech Data Science	54	CS/EC/EE/MA/CE/IN/ME/PH/ST/GE (13)	6	4	2	1	AE/AG/AR/BM/BT/CE/CH/CY/ES/EY/GG/MN/MT/PE/PI/TF/XE/XH/XL(5)	2	1	1	1	2		20	
21	Hydrology (HYD)	M.Tech Dam Safety and Rehabilitation	55	CE (7)	3	2	1	1	-					1	1	8	8
22	Applied Mathematics and Scientific Computing (AMS)	M.Tech. Applied Mathematics and Scientific Computing	57	MA/ST/CS/EE/EC (18)	8	5	3	2	-					2	1	20	20
		Total			242	163	91	48		58	41	22	14	74	41	753	753

*Additional 5 seats, sponsored by MNRE

07 MAR 2023

UG Seat Matrix for the Session 2023-24	
Programme Name	**Total**
B.Tech. Biosciences and Bioengineering (4-year Bachelor of Technology)	46
B.Tech. Chemical Engineering (4-year Bachelor of Technology)	117
B.Tech. Civil Engineering (4-year Bachelor of Technology)	174
B.Tech. Computer Science and Engineering (4-year Bachelor of Technology)	109
B.Tech. Electrical Engineering (4-year Bachelor of Technology)	165
B.Tech. Electronics and Communication Engineering (4-year Bachelor of Technology)	109
B.Tech. Engineering Physics (4-year Bachelor of Technology)	50
B.Tech. Mechanical Engineering (4-year Bachelor of Technology)	150
B.Tech. Metallurgical and Materials Engineering (4-year Bachelor of Technology)	82
B.Tech. Production and Industrial Engineering (4-year Bachelor of Technology)	58
Bachelor of Architecture (5-year Bachelor of Architecture)	30
M.Tech. (Geological Technology) (5-year Integrated Master of Technology)	38
M.Tech. (Geophysical Technology) (5-year Integrated Master of Technology)	41
BS-MS (Mathematics and Computing) {5-year (4+1) Dual Degree}	49
BS-MS (Chemical Sciences) {5-year (4+1) Dual Degree}	35
BS-MS (Physics) {5-year (4+1) Dual Degree}	27
BS-MS (Economics) {5-year (4+1) Dual Degree}	33
B.Tech. in Data Science & Artificial Intelligence	40
Total	**1353**

07 MAR 2023

Appendix 'E'
Item No. Senate / 94.15
Annexure-A

Category wise vacancy for admission to Ph.D program for Autumn Semester of the session 2023-24 under Institute Assistantship

Deptt/ centre	Faculty position as on August 01, 2022	Total Seats = 5 x core faculty & 2 x Joint faculty	Total Intake						Seats Filled						Vacancy					
			Unreserved	Gen-EWS	OBC	SC	ST	Total Intake	Unreserved	Gen-EWS	OBC	SC	ST	Total filled	Unreserved	GEN-EWS	OBC	SC	ST	Total Vacancy
(Roorkee Campus)																				
Architecture and Planning	15	75	30	8	20	11	6	75	15	1	9	7	1	33	15	7	11	4	5	42
Biosciences and Bioengineering	26+2*	134	54	14	36	20	10	134	21	2	10	2	0	35	33	12	26	18	10	99
Chemical Engineering	24	120	49	12	32	18	9	120	20	7	17	13	3	60	29	5	15	5	6	60
Chemistry	27	135	55	14	36	20	10	135	22	4	15	3	2	46	33	10	21	17	8	89
Civil Engineering	55	275	111	28	74	41	21	275	69	12	36	20	9	146	42	16	38	21	12	129
Computer Science and Engg.	16+1*	82	33	8	22	13	6	82	20	0	7	4	0	31	13	8	15	9	6	51
Design	2+14*	38	15	4	10	6	3	38	6	1	3	2	0	12	9	3	7	4	3	26
Earth Sciences	27	135	55	14	36	20	10	135	23	6	10	1	0	40	32	8	26	19	10	95
Earthquake Engineering	16	80	32	8	22	12	6	80	17	3	12	2	2	36	15	5	10	10	4	44
Electrical Engineering	36	180	73	18	49	27	13	180	36	14	26	14	5	95	37	4	23	13	8	85
Electronics and Communication Engg.	35	175	71	18	47	26	13	175	42	6	24	11	0	83	29	12	23	15	13	92
Humanities and Social Sciences	26	130	53	13	35	19	10	130	29	10	22	10	7	78	24	3	13	9	3	52
Hydro and Renewable Energy	10	50	20	5	14	7	4	50	9	0	7	3	0	19	11	5	7	4	4	31
Hydrology	9	45	18	5	12	7	3	45	13	0	7	2	0	22	5	5	5	5	3	23
Management Studies	20	100	41	10	27	15	7	100	20	3	6	5	0	34	21	7	21	10	7	66
Mathematics	27	135	55	14	36	20	10	135	11	6	2	5	0	24	44	8	34	15	10	111
Mechanical and Industrial Engg.	44	220	89	22	59	33	17	220	44	11	31	11	4	101	45	11	28	22	13	119
Metallurgical and Materials Engg.	25	125	51	12	34	19	9	125	23	0	16	10	0	49	28	12	18	9	9	76
Physics	38	190	77	19	51	29	14	190	42	13	19	4	1	79	35	6	32	25	13	111
Water Resouces Development and Management	10+2*	54	22	5	15	8	4	54	10	4	11	4	1	30	12	1	4	4	3	24
Centres		2478	1004	251	667	371	185	2478	492	103	290	133	35	1053	512	148	377	238	150	1425
C-Trans	1+10*	25	10	2	7	4	2	25	3	0	5	0	0	8	7	2	2	4	2	17
Dis. Mit. & Magnt	3+16*	47	19	5	13	7	3	47	8	1	1	2	1	13	11	4	12	5	2	34
Nanotechnology	1+21*	47	19	5	13	7	3	47	6	3	5	2	0	16	13	2	8	5	3	31
MFSAIDS	23*	46	19	5	12	7	3	46	5	0	2	0	0	7	14	5	10	7	3	39
Institute Instrumentation Centre	1	5	2	1	1	1	0	5	2	0	1	0	0	3	0	1	0	1	0	2
Centre for Photonics and Quantum Communication Technology (CPQCT)	11*	22	9	2	6	3	2	22	2	0	0	2	0	4	7	2	6	1	2	18
Total		192	78	20	52	29	13	192	26	4	14	6	1	51	52	16	38	23	12	141
(Saharanpur Campus)	Total Seat @ 8 x no. of faculty																			
Applied Mathematics and Scientific Computing	3	24	10	2	6	4	2	24	5	1	2	0	1	9	5	1	4	4	1	15
Paper Technology	6	48	19	5	13	7	4	48	5	0	2	2	0	9	14	5	11	5	4	39
Polymer and Process Engg.	10	80	32	8	22	12	6	80	21	0	9	3	0	33	11	8	13	9	6	47
Total		152	61	15	41	23	12	152	31	1	13	5	1	51	30	14	28	18	11	101
Grand total		2822	1143	286	760	423	210	2822	549	108	317	144	37	1155	594	178	443	279	173	1667

* Joint Faculty

Note: PwD seats are 5% horizontal

07 MAR 2023

Senate approved PDC List

Sl.No.	Name	Deptt.	Topic	Supervisor	Examiner (For./Ind.)	PDC Date
1	Mr. Mayank Singh	AMSC	STUDY OF CERTAIN QUASI-LINEAR HYPERBOLIC SYSTEMS OF PDES	Prof. Rajan Arora	Prof. Dehua Wang, University of Pittsburgh, USA Prof. Tommaso Ruggeri, University of Bologna, Italy	14.02.23
2	Mr. Naman Mirajkar	AR	BIOMIMICRY BASED THERMALLY RESISTANT WALLING UNIT DESIGN	Prof. Avlokita Agrawal	Prof. I.G.P. Rajapaksha, Univ.of Moratuwa, Sri Lanka Prof. Bishwajit Bhattacharjee, IIT Delhi Prof. Henry Feriadi, Duta Wacana Christian Univ., Indonesia	02.01.23
3	Mr. Deena Nath Gupta	B&B	STUDIES OF ANTIOXIDANT ENZYME PEROXIREDOXINS FROM CANDIDATUS LIBERIBACTER ASIATICUS AND ITS HOST CITRUS SINENSIS	Prof. A. K. Sharma	Prof. Mahesh Narayan,Univ. of Texas at El Paso,USA Prof. Christian Betzel, Univ. of Hamburg, Germany	29.12.22
4	Mr. Purusottam Mishra	B&B	FABRICATION OF ESSENTIAL OILS LOADED ELECTROSPUN NANOFIBERS FOR BIOMEDICAL USAGE	Prof. Ramasare Prasad Prof. Vikas Pruthi	Prof. Rohit Srivastava, IIT Bombay Prof. Dimitrios Lamprou, Queen's Univ. Belfast, UK	19.01.23
5	Ms. Parul Katiyar	B&B	ROLE OF EDCS IN NEURODEGENERATION AND IT'S PROTECTION BY SOME NEUROPROTECTIVE AGENTS	Prof. Partha Roy	Prof. Amal Kanti Bera, IIT Madras Prof. Rakesh K. Tyagi, JNU New Delhi	23.01.23
6	Mr. Viney Kumar	B&B	MECHANISTIC INSIGHT INTO THE METASTATIC BREAST CANCER AND BONE DISORDER AMELIORATIVE EFFECT OF A CONJUGATE COMPOUND, PTEROSTILBENEISOTHIOCYANATE (PTER-ITC)	Prof. Partha Roy	Prof. Rakesh K. Tyagi, JNU New Delhi Prof. Amal Kanti Bera, IIT Madras	23.01.23
7	Mr. Vinay Kumar	B&B	DESIGN AND DEVELOPMENT OF SILK PROTEIN-BASED COMPOSITE MATERIALS FOR BIOMEDICAL APPLICATIONS	Prof. P. Gopinath	Prof. Siddhartha Sankar Ghosh, IIT Guwahati Prof. Aditya Mittal, IIT Delhi	06.02.23
8	Ms. Komal Kushwaha	B&B	NUTRITIONAL PROFILE OF PAPAYA FRUIT AND NONDESTRUCTIVE PREDICTION OF RIPENING STAGES OF PAPAYA USING VOLATILE BIOMARKERS	Prof. Debabrata Sircar	Prof. Mukesh Jain, JNU New Delhi Prof. B. K. Sarma, BHU Varanasi	20.02.23
9	Ms. Banafsha Ahmed	CE	ANAEROBIC CO-DIGESTION OF THERMO-CHEMICALLY PRE-TREATED MUNICIPAL SOLID WASTE	Prof. A. A. Kazmi Dr. Vinay Kumar Tyagi	Prof. A. K. Gupta, IIT Kharagpur Prof. Makarand M. Ghangrekar, IIT Kharagpur Prof. Zhou Yan, NTU, Singapore	23.01.23
10	Mr. Abhinav Gupta	CE	ADAPTIVE ANALYSIS USING ISOPARAMETRIC AND ISOGEOMETRIC ELEMENTS: APPLICATION TOWARDS TOPOLOGY	Prof. Rajib Chowdhury Prof. Anupam Chakrabarti	Prof. Emilio Martinez Paneda, Imperial College London, London Prof. Stephane P.A. Bordas, 2 Avenue de Universite, Luxembourg	01.02.23

07 MAR 2023

			OPTIMIZATION, FRACTURE, AND MULTIPHYSICS PROBLEMS			
11	Mr. Pushpraj Patel	CH	SUSTAINABLE GREYWATER TREATMENT THROUGH ADSORPTION AND ELECTROCOAGULATION PROCESS	Prof. Prasenjit Mondal	Prof. Kaustubha Mohanty, IIT Guwahati Prof. Anthony Szymczyk, Univ. de Rennes, France	12.01.23
12	Mr. Ram Singh	CH	TOWARDS THE DESIGN OF MIXED METAL (OXIDE) CATALYSTS AND LIGHT-RESPONSIVE LIGANDS USING QUANTUM CHEMISTRY CALCULATIONS	Prof. Prateek K. Jha	Prof. Vishal Agarwal, IIT Kanpur Prof. Harish Vashisth, Univ. of New Hampshire, USA	27.01.23
13	Ms. Anupama Kumari	CH	STUDIES ON THE FORMATION AND DISSOCIATION OF GAS HYDRATES IN POROUS SEDIMENTS	Prof. C. B. Majumder	Dr. N. Vedachalam, Ministry of Earth Sci. Chennai Prof. Kalachand Sain, WIHG Dehradun	02.02.23
14	Mr. Sumit Sharma	CSE	A STUDY ON DESIGNING ALL-OPTICAL MULTIPLIERS AND OPTICAL CHANNEL ROUTING IN PHOTONIC INTEGRATED CIRCUITS	Prof. Sudip Roy	Prof. Saraju P. Mohanty, Univ. of North Texas, USA Prof. Kyriakos Zoiros, Democritus Univ. of Thrace, Greece	12.01.23
15	Mr. Gaurav Kumar Nim	CY	SYNTHESIS OF FLUORESCENT PEROVSKITE NANOMATERIALS AND THEIR APPLICATIONS	Prof. Prasenjit Kar	Prof. Lorenzo Malavasi, Univ. of Pavia & INSTM, Italy Prof. Raju Kumar Gupta, IIT Kanpur	09.01.23
16	Mr. Abhishek Maurya	CY	PYRENE-BASED ORGANIC MATERIALS FOR ELECTRONIC APPLICATIONS	Prof. K. R. Justin Thomas	Prof. Parameswar K. Iyer, IIT Guwahati Prof. Rajneesh Misra, IIT Indore	20.02.23
17	Mr. Naveen Kumar	CY	CATALYTIC POTENTIALS OF VANADIUM AND TUNGSTEN COMPLEXES OF POLYDENTATE LIGANDS	Prof. M. R. Maurya	Prof. Dieter Rehder, Univ. of Hamburg, Germany Prof. Anil J. Elias, IIT Delhi	20.02.23
18	Ms. Km. Kavita Vishwakarma	ECE	FABRICATION AND CHARACTERIZATION OF METALOXIDE RESISTIVE RANDOM-ACCESS MEMORY DEVICES FOR DATA STORAGE AND ARTIFICIAL SYNAPSE	Prof. Arnab Datta	Prof. Shaibal Mukherjee, IIT Indore Prof. Adrian M. Ionescu, Swiss Federal Institute of Technology Lausanne, Switzerland	23.01.23
19	Mr. Sukhlal Sisodiya	EE	DEMAND-SIDE MANAGEMENT IN POWER DISTRIBUTION SYSTEM	Prof. G. B. Kumbhar	Prof. Alfredo Vaccaro, University of Sannio, Italy Prof. R. K. Saket, IIT (BHU) Varanasi	26.12.22
20	Mr. Prateek Singh	EE	AUTOMATED ARRHYTHMIA DETECTION USING ECG SIGNALS	Prof. Ambalika Sharma	Prof. Dinesh Kumar, RMIT University, Australia Prof. Pinaki Sarder, University of Florida, USA	29.12.22
21	Mr. Muneer V.	EE	INVESTIGATION ON THREE PHASE CHB BASED SAPF AND UPQC	Prof. Avik Bhattacharya	Prof. Santosh Kumar Singh, IIT (BHU) Varanasi Prof. Sanjib K. Panda, National University Singapore	18.01.23
22	Mr. Ashish Bahuguna	EQ	3–D FINITE ELEMENT MODELLING OF INDIAN TECTONIC PLATE TO INVESTIGATE THE INTRAPLATE STRESS DISTRIBUTION AND DEFORMATION	Prof. D. Shanker	Prof. Boris Jeremic, University of California, USA Prof. Jiancang Zhuang, Graduate Univ. of Advanced Studies, Japan	31.01.23

23	Mr. Bishnu Prasad Mishra	ES	GEOLOGICAL, MINERALOGICAL, AND GEOCHEMICAL STUDIES OF VOLCANOGENIC MASSIVE SULFIDE DEPOSITS IN BETUL BELT, CENTRAL INDIA	Prof. Pitambar Pati Dr. L. Lachhan Dora	Prof. Sakthi Saravanam Chinnasamy, IIT Bombay Prof. Joyashish Thakurta, Natural Resources Research Institute, USA	29.12.22
24	Mr. Abhirup Saha	ES	TRANSGRESSIVE-REGRESSIVE CYCLES IN PERMIAN BARREN MEASURES FORMATION, PRANHITAGODAVARI VALLEY, INDIA– IMPLICATIONS ON PALAEOGEOGRAPHY	Prof. B. Bhattacharya	Prof. Santanu Banerjee, IIT Bombay Prof. Andrew La Croix, Univ. of Waikato, New Zealand	11.01.23
25	Mr. Rakesh Kumar	ES	RESPONSE OF DEEP SEA BENTHIC FORAMINIFERA ACROSS THE EOCENE - OLIGOCENE BOUNDARY OF THE SOUTHERN OCEAN	Prof. A. S. Maurya	Prof. Arun Deo Singh, BHU Varanasi Prof. Ajoy Kumar Bhaumik, IIT (ISM) Dhanbad	13.01.23
26	Ms. Akshita Gupta	HRE	RENEWABLE ENERGY FORECASTING BASED HYDROPOWER SCHEDULING	Prof. Arun Kumar	Dr. V. Jothiprakash, IIT Bombay Prof. Lennart Söder, KTH - RIT, Sweden	27.12.22
27	Mr. Mohit Singh Rana	HRE	NANOTECHNOLOGICAL INTERVENTIONS FOR MIXOTROPHIC MICROALGAE CULITVATION AND BIOENERGY GENERATION	Prof. Sanjeev K. Prajapati	Prof. Gopalakrishan K., Univ. of Stavanger, Norway Prof. Selvaraju Narayanasamy, IIT Guwahati	02.01.23
28	Mr. Haile Ademe Ayalew	HSS	THE ROLE OF REMITTANCES ON HUMAN CAPITAL FORMATION AND LABOUR MARKET OUTCOMES OF LEFT-BEHIND HOUSEHOLD MEMBERS IN ETHIOPIA	Prof. P. C. Mohanty	Prof. Minaketan Behera, JNU New Delhi Prof. Arup Mitra, SAU New Delhi	17.01.23
29	Mr. Zakir Hussain	HSS	POETICS OF PROTEST: DE-ORIENTALISING EUROCENTRIC HISTORY AND IDENTITY IN TARIQ ALI'S ISLAM QUINTET	Prof. Binod Mishra	Prof. Maya Shanker Pandey, BHU Varanasi Prof. Jose-Carlos Redondo-Olmedilla, University of Almeria, Spain	31.01.23
30	Ms. Meenakshi	HSS	DECONSTRUCTING MYTHOLOGY: A FEMINIST REVISIONIST ANALYSIS OF KAVITA KANÉ'S SELECT NOVELS	Prof. Nagendra Kumar	Prof. Priyanka Tripathi, IIT Patna Prof. Rajni Singh, IIT (ISM) Dhanbad	07.02.23
31	Mr. Ankit Raj	HSS	THE WEARY ROAD REDEFINED: A STUDY OF MYTHS AND ARCHETYPES IN KURT VONNEGUT'S SELECT FICTION	Prof. Nagendra Kumar	Prof. Banibrata Mahanta, BHU Varanasi Prof. Yogesh Kumar Sinha, Ohio University, USA	07.02.23
32	Mr. Shashikant Das	MIE	STUDY OF THERMOREGULATORY MECHANISM, SENSATION AND PERFORMANCE OF HUMAN BODY DURING COMMUTE IN A HOT THERMAL ENVIRONMENT	Prof. Sudhakar Subudhi	Prof. Amaresh Dalal, IIT Guwahati Prof. Sushanta Mitra, Univ. of Waterloo, Canada Prof. Perumal Nithiarasu, Swansea Univ. Bay, UK	29.12.22
33	Mr. Vipul Kumar Gupta	MIE	INVESTIGATIONS ON INCLUSION TRANSPORT AND SOLIDIFICATION BEHAVIOUR IN CONTINUOUS	Prof. Pradeep K. Jha	Prof. N. S. Reddy, Gyeongsang National University, South Korea Prof. Gour Gopal Roy, IIT Kharagpur	11.01.23

07 MAR 2023

			CASTING PROCESS USING MULTIPHASE ANALYSIS			
34	Mr. Vanajara Maheshbhai Javarabhai	MIE	EXPERIMENTAL INVESTIGATION FOR THE FLOE OF R32 IN A CAPILLARY TUBE	Prof. Ravi Kumar Prof. Anil Kumar	Prof. Akio Miyara, Saga University, Saga-Shi, Japan Prof. Shaligram Tiwari, IIT Madras	14.02.23
35	Mr. Anish Kumar	MIE	STUDY OF PERISHABLE FOOD SUPPLY CHAINS	Prof. Pradeep Kumar Dr. Sachin K. Mangla	Prof. Parveen S. Goel, Director of Engg. & Continuous Improvement (Pacific Region), Canada Prof. S. G. Deshmukh, IIT Delhi	14.02.23
36	Mr. Abhishek Kumar Singh	MIE	DEVELOPMENT OF A PARALLEL MLPG SOLVER FOR HEAT CONDUCTION PROBLEMS	Prof. K. M. Singh	Prof. Shaligram Tiwari, IIT Madras Prof. Toshiro Matsumoto, Nagoya University, Japan	14.02.23
37	Mr. Amit Kumar Yadav	MIE	MODELING AND ANALYSIS OF SUSTAINABLE VACCINE SUPPLY CHAIN ISSUES FOR INDIAN HEALTHCARE SYSTEM	Prof. Dinesh Kumar	Prof. Prabhas Bhardwaj, IIT (BHU) Varanasi Prof. J. Paulo Davim, Univ. of Aveiro, PORTUGAL	20.02.23
38	Mr. Vijyapu Prasanna Kumar	MS	ASSESSING IMPAIRMENT OF BANK LOANS: INDIAN CONTEXT vis-à-vis CROSS-COUNTRY ANALYSIS	Prof. Sujata Kar	Prof. S. Narayan Rao, IIT Bombay Prof. Tao Chen, Nanyang Business School, Singapore Prof. M. Thenmozhi, IIT Madras	07.02.23
39	Mr. Jitendra Kumar	PH	REVEALING NON-RADIATIVE LOSSES IN HALIDE PEROVSKITES WITH PHOTOLUMINESCENCE MICRO-SPECTROSCOPY	Prof. Monojit Bag	Prof. Dinesh Kabra, IIT Bombay Prof. Ivan Scheblykin, Lund University, Sweden	30.12.22
40	Ms. Bharti Bhoy	PH	SHELL-MODEL STUDY FOR NEUTRON-RICH NUCLEI	Prof. P. C. Srivastava	Prof. A. K. Singh, IIT Kharagpur Prof. B. Alex Brown, Michigan State University, USA	02.02.23
41	Ms. Smruti Purohit	PH	PEROVSKITE BASED HETEROSTRUCTURES FOR PHOTOCATALYTIC APPLICATIONS	Prof. K. L. Yadav Prof. Soumitra Satapathi	Prof. Jayant Kumar, Univ. of Massachusetts Lowell, USA Prof. Venkata Krishnan, IIT Mandi	09.02.23
42	Ms. Tanmoyee Bhattacharya	WRD	HYDROLOGIC CHARACTERISTIC ANALYSIS IN GLACIERIZED BASIN CONSIDERING CLIMATE IMPACT, LAND USE CHANGES AND ELEVATION DEPENDENT BEHAVIOUR OF METEOROLOGICAL DATA	Prof. Deepak Khare Dr. Manohar Arora	Prof. Chandranath Chatterjee, IIT Kharagpur Prof. Ronny Berndtsson, Lund University, Sweden Prof. B. R. Chahar, IIT Delhi	03.01.23