



Indian Institute of Technology Indore

Minutes of the 40th meeting of the Senate held on 25 January 2024 (Thursday) 3.00 p.m. at Gargi Seminar Hall, IIT Indore.

Following members attended the meeting:

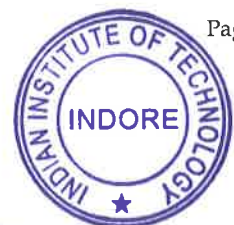
Chairperson		
1	Prof. Suhas S. Joshi	Director, IIT Indore
Deans		
2	Prof. Vipul Singh	Dean, Academic Affairs
3	Prof. Sandeep Chaudhary (present online)	Dean, Administration
4	Prof. Manish Kumar Goyal	Dean, Infrastructure Development
5	Prof. I. A. Palani (present online)	Dean, Research and Development
6	Prof. Srivathsan Vasudevan	Dean, Student Affairs
Head of Departments		
7	Dr. Abhishek Rajput	HoD, Civil Engineering
8	Dr. Ranveer Singh (present online)	HoD, Computer Science and Engineering
9	Prof. Vivek Kanhangad	HoD, Electrical Engineering
10	Prof. Shanmugam Dhinakaran (present online)	HoD, Mechanical Engineering
11	Dr. Ajay Kumar Kushwaha (present online)	HoD, Metallurgical Engineering and Materials Science
12	Prof. Amit Kumar (present online)	HoD, Biosciences and Biomedical Engineering
13	Dr. Manoneeta Chakraborty	Acting HoD, Astronomy, Astrophysics and Space Engineering
14	Prof. Preeti A. Bhobe	HoD, Physics
15	Prof. Ruchi Sharma	HoD, Humanities and Social Sciences
Professors		
16	Prof. Abhinav Kranti (present online)	Electrical Engineering
17	Prof. Sandeep Chaudhary (present online)	Civil Engineering
18	Prof. Prabhat Kumar Upadhyay (present online)	Electrical Engineering
19	Prof. Trapti Jain (present online)	Electrical Engineering
20	Prof. Manish Kumar Goyal	Civil Engineering
21	Prof. I. A. Palani (present online)	Mechanical Engineering
22	Prof. Bhupesh Kumar Lad (present online)	Mechanical Engineering



23	Prof. Dhinakaran Shanmugam (present online)	Mechanical Engineering
24	Prof. Aruna Tiwari	Computer Science and Engineering
25	Prof. Amit Kumar (present online)	Biosciences and Biomedical Engineering
26	Prof. Nirmala Menon	Humanities and Social Sciences
27	Prof. Ruchi Sharma	Humanities and Social Sciences
28	Prof. Preeti Anand Bhobe	Physics
29	Prof. Rajesh Kumar	Physics
30	Prof. Amod C. Umarikar	Electrical Engineering
31	Prof. Vivek Kanhangad	Electrical Engineering
32	Prof. Srivathsan Vasudevan	Electrical Engineering
33	Prof. Pankaj Ramesh Sagdeo	Physics
34	Prof. Ankhi Roy	Physics
35	Prof. Chelvam Venkatesh (present online)	Chemistry
36	Prof. Anirban Sengupta (present online)	Computer Science and Engineering
37	Prof. Rupesh Shivaji Devan (present online)	Metallurgical Engineering and Materials Science
38	Prof. Satyajit Chatterjee	Mechanical Engineering
Other Authorities		
39	Dr. Anand Petare	Workshop Superintendent, Central Workshop
Special Invitees		
40	Dr. Mayur Jain	Civil Engineering
41	Dr. Priyank Sharma	Civil Engineering
42	Dr. Akshay Pratap Singh	Civil Engineering
43	Dr. Gourab Sil	Civil Engineering
44	Dr. Vijay AS	Electrical Engineering
45	Dr. R. Swaminathan	Electrical Engineering
46	Prof. S. Vasudevan	Electrical Engineering
47	Mr. Rajesh Kumar	Assistant Librarian
48	Mr. Neeraj Kumar	Assistant Registrar, Academic Affairs
49	Mr. Tapes Parihara	Section Officer, Academic Office
Secretary		
50	Mr. S. P. Hota	Registrar, IIT Indore
Leave of absence		
51	Prof. Himanshu Rai	Director, IIM Indore
52	Dr. Shankar V. Nakhe	Director, RRCAT
53	Prof. Abhiram G. Ranade	Professor, Department of Computer Science and Engineering, IIT Bombay
54	Prof. Avinash Sonawane	Dean, International Relation
55	Prof. Suman Mukhopadhyay	Dean, Alumni and Corporate Relations
56	Prof. Abhishek Srivastava	Dean, Faculty Affairs
57	Prof. Devendra L. Deshmukh	Dean, Educational Outreach



58	Prof. Tushar Kanti Mukherjee	HoD, Chemistry
59	Prof. Niraj Kumar Shukla	HoD, Mathematics
60	Prof. Narendra S. Choudhary	Computer Science and Engineering
61	Prof. Neelesh Kumar Jain	Mechanical Engineering
62	Prof. Anand Parey	Mechanical Engineering
63	Prof. Ram Bilas Pachori	Electrical Engineering
64	Prof. Vimal Bhatia	Electrical Engineering
65	Prof. Rajneesh Misra	Chemistry
62	Prof. Suman Mukhopadhyay	Chemistry
63	Prof. Subhendu Rakshit	Physics
64	Prof. Krushna R. Mavani	Physics
65	Prof. Sarika Jalan	Physics
66	Prof. Avinash Sonawane	Biosciences and Biomedical Engineering
67	Prof. G. S. Murthy	Biosciences and Biomedical Engineering
68	Prof. Santosh Kumar Vishvakarma	Electrical Engineering
69	Prof. Shaibal Mukherjee	Electrical Engineering
70	Prof. Mukesh Kumar	Electrical Engineering
71	Prof. Neelima Devarakonda Satyam	Civil Engineering
72	Prof. Santosh Kumar Sahu	Mechanical Engineering
73	Prof. Ritunesh Kumar	Mechanical Engineering
74	Prof. Abhishek Srivastava	Computer Science and Engineering
75	Prof. Kapil Ahuja	Computer Science and Engineering
76	Prof. Abhirup Datta	Astronomy, Astrophysics and Space Engineering
77	Prof. Prashant Kodgire	Biosciences and Biomedical Engineering
78	Prof. Sk. Safique Ahmad	Mathematics
79	Prof. Apurba Kumar Das	Chemistry
80	Prof. Sampak Samanta	Chemistry
81	Prof. Sanjay Kumar Singh	Chemistry
82	Prof. Biswarup Pathak	Chemistry
83	Prof. Pritee Sharma	Humanities and Social Sciences
84	Prof. Sudeshna Chattopadhyay	Physics
85	Prof. Parasharam M. Shirage	Metallurgical Engineering and Materials Science
86	Prof. Swadesh Kumar Sahoo	Mathematics
87	Prof. Raghunath Sahoo	Physics
88	Prof. Devendra L. Deshmukh	Mechanical Engineering
89	Prof. Somaditya Sen	Physics
90	Prof. Mobin Shaikh	Chemistry
91	Prof. Tushar Kanti Mukherjee	Chemistry
92	Prof. Anjan Chakraborty	Chemistry
93	Prof. Satya Silendra Bulusu	Chemistry



94	Prof. Kiran Bala	Biosciences and Biomedical Engineering
95	Prof. Mirza Saqib Baig	Biosciences and Biomedical Engineering
96	Prof. Neminath Hubballi	Computer Science and Engineering
97	Prof. Santosh Sattappa Hosmani	Metallurgical Engineering and Materials Science
98	Prof. Antony Vijesh Villavarayan	Mathematics
99	Prof. Niraj Kumar Shukla	Mathematics
100	Prof. Kazi Sabiruddin	Mechanical Engineering
101	Prof. Pavan Kumar Kankar	Mechanical Engineering
102	Dr. Jayaprakash Murugesan	Chief Warden
103	Dr. Sharad Gupta	Convener, Health Center Advisor Committee
104	General Secretary, Student Gymkhana	Ex-officio
105	Academic Secretary, Student Gymkhana	Ex-officio

ITEM 40.1: Welcome and Opening remarks by the Chairman of the Senate.

The Chairman, Senate welcomed all the members and special invitees to the meeting.

He informed that this meeting is mainly for approval of syllabi of courses for B.Tech. 2nd year of revised UG Curriculum of "Civil Engineering" and syllabi of courses for B.Tech. 2nd, 3rd, and 4th year of revised UG Curriculum of 'Electrical Engineering' w.r.t. the NEP-2020 guidelines.

He announced that the next Senate meeting will be likely be to discuss syllabi of courses for B.Tech. 2nd, 3rd, and 4th year of "Mechanical Engineering" and "Metallurgical Engineering and Materials Science" as per the NEP-2020 guidelines.

ITEM 40.2: Confirmation of the minutes of the 39th Meeting of Senate held on 15 January 2024.

The Senate confirmed the minutes of its 39th Meeting of Senate held on 15 January, 2024.

ITEM 40.3: Action Taken Report (ATR) on minutes of 39th Meeting of Senate held on 15 January 2024.

The Senate noted the actions taken on the decisions of the 39th Meeting of Senate held on 15 January, 2024.

ITEM 40.4: Syllabi of courses for B.Tech. 2nd year of 'Civil Engineering' w.r.t. the NEP-2020 guidelines.

HoD, Civil Engineering presented the course structure of revised UG Curriculum for B.Tech. 2nd year. Subsequently DUGC, Convenor Civil Engineering presented the detailed syllabi of courses of the same w.r.t. the NEP-2020 guidelines.

The Senate discussed and approved the following courses with remarks as given below:

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Course Code	Course Name	Weekly Contact Hours L-T-P	Total Credits	Senate remarks
2nd Year -Semester 3				
ZZ 3xx	Course-I for Minor Program	x-x-x	3	
MA 205	Complex Analysis	3-1-0-2 (1/2 semester)	2	Already Approved
MA 207	Differential Equations-II	3-1-0-2 (1/2 semester)	2	
CE 205	Strength of Materials	2- 1- 0	3	Approved
CE 203N	Fluid Mechanics	2- 1- 0	3	Approved
CE 253N	Fluid Mechanics Lab	0- 0- 3	1.5	Approved (As suggested by Chairman, Senate, the L-T-P-C has been revised 0-0-2-1 to 0-0-3-1.5 due to merger of two lab courses.)
CE 207	Building Materials	2- 0- 2	3	Approved
CE 209	Surveying	2- 1- 0	3	Approved
CE 255	Strength of Materials Lab	0- 0- 2	1	Approved
CE 259	Surveying Lab	0- 0- 2	1	Approved
CE 2xx	Department Elective (DE-I)	x-x-x	3	
	Total		22.5/25.5	
2nd Year-Semester 4				
ZZ 2xx	Course-II for Minor Program	x-x-x	3	
MA 204N	Numerical Methods	2-0-2	3	Already approved
CE 210	Structural Analysis-I	2- 1- 0	3	Approved
CE 212	Soil Mechanics-I	2- 1- 0	3	Approved
CE 214	Engineering Geology	2- 0- 2	3	Approved



CE 252	Soil Mechanics Lab-I	0- 0- 2	1	Approved
CE 218	Environmental Engineering	2- 1- 0	3	Approved
CE 258	Environmental Engineering Lab	0- 0- 2	1	Approved subject to the condition that various methods used for experimental determination of pH etc. are included in the core syllabus.
CE 2xx	Department Elective (DE-II)	x-x-x	3	-
ZZ 2xx	Institute Elective-I	x-x-x	3	-
	Total		23/26	
<u>Elective Courses</u>				
CE 211	Smart Cities	2-1-0	3	Approved with revised course title from 'Futuristic Smart Cities' to 'Smart Cities'
CE 213	Optimization Methods for Civil Engineering	2-1-0	3	Approved
CE 220	Water Resources Planning and Management	2-1-0	3	Approved
CE 222	Estimation and Costing	2-1-0	3	Approved with revised course title 'Estimating and Costing' to 'Estimation and Costing'

ITEM 40.5: Syllabi of courses for B.Tech. 2nd, 3rd, and 4th year of revised UG Curriculum of "Electrical Engineering" w.r.t. the NEP-2020 guidelines.

HoD, Electrical Engineering presented the course structure for B.Tech. 2nd, 3rd, and 4th year subsequently DUGC Convenor Electrical Engineering, presented the detailed syllabi of courses of the same w.r.t. the NEP-2020 guidelines.

The Senate discussed and approved the following courses with remarks as given below:

Course Code	Course Name	Weekly Contact Hours L-T-P	Total Credits	Senate remarks
2nd Year-Semester 3				
ZZ 2xx	Course-I for Minor Program	x-x-x	3	Approved



MA 205	Complex Analysis	3-1-0-2 (1/2 semester)	2	Approved
MA 207	Differential Equations-II	3-1-0-2 (1/2 semester)	2	
EE 201	Network Theory	2 - 1 - 0	3	Already approved
EE 203	Electronic Devices	2 - 1 - 0	3	Already approved
EE 207	Electric Machines	2 - 1 - 0	3	Approved
EE 209	Digital Systems	2 - 1 - 0	3	Approved
EE 253N	Electronic Devices Lab	0 - 0 - 2	1	Approved
EE 259	Digital Systems Lab	0 - 0 - 2	1	Approved
EE 251	Electrical Networks Lab	0 - 0 - 2	1	Approved
EE 2XX	Department Elective - I	X - X - X	3	-
	Total		22/25	
2nd Year-Semester 4				
ZZ 2xx	Course-II for Minor Program	x-x-x	3	-
MA 204N	Numerical Methods	2-0-2	3	Already approved
EE 202N	Signals and Systems	2 - 1 - 0	3	Approved
EE 204	Analog Circuits	2 - 1 - 0	3	Already approved
EE 212	Power Electronics	2 - 1 - 0	3	Approved
EE 254	Analog Circuits Lab	0 - 0 - 3	1.5	Already approved
EE 252	Electric Machines and Power Electronics Lab	0 - 0 - 3	1.5	Approved with revised course title in the syllabus from 'Electrical Machine and Power Electronics Lab' to 'Electric Machine and Power Electronics Lab'
EE 2xx	Department Elective (DE-II)	x-x-x	3	-
ZZ 2xx	Institute Elective-I	x-x-x	3	-
	Total		21 /24	
3rd Year-Semester 5				



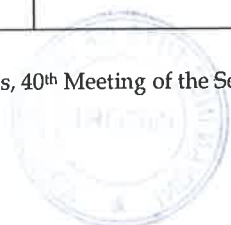
ZZ 3xx	Course III - Minor Program	x-x-x	3	-
EE 301N	Microprocessors and Digital Systems design	2 - 1 - 0	3	Already approved
EE 313	Communication System Theory	2 - 1 - 0	3	Approved
EE 305	Electromagnetic waves	2 - 1 - 0	3	Already approved
EE 315	Power Systems	2 - 1 - 0	3	Approved
EE 317	Digital Signal Processing	2 - 1 - 0	3	Approved
EE 351N	Microprocessors and Digital Systems Design Lab	0 - 0 - 2	1	Approved
EE 3xx	Department Elective (DE-III)	x-x-x	3	-
ZZ 3xx	Institute Elective-II	x-x-x	3	-
	Total		22/25	

3rd Year-Semester 6

ZZ 3xx	Course IV - Minor Program	x-x-x	3	-
EE 302	Control Systems	2 - 1 - 0	3	Already approved
EE 306	Digital Communications	2 - 1 - 0	3	Already approved
EE 310	VLSI Systems and Technology	2 - 0 - 2	3	Approved subject to inclusion of the list of experiments for lab component in the course content.
EE 352N	Control Systems Lab	0 - 0 - 3	1.5	Approved to revise the course credit L-T-P-C from 0-0-2-1 to 0-0-3-1.5
EE 356N	Communications Lab	0 - 0 - 2	1	Approved
EE 3xx	Department Elective (DE-IV)	x-x-x	3	-



EE 3xx	Department Elective (DE-V)	x-x-x	3	-
ZZ 3xx	Institute Elective-III	x-x-x	3	-
	Total		20.5/23.5	
4th Year-Semester 7				
ZZ 4xx	Course-V for Minor Program	x-x-x	2	-
EE 493	B Tech Project (BTP)	0-0-32	16	-
EE 495	Internship - I	x-x-x	1	-
EE 497	Internship - II	x-x-x	1	-
	Total		18/20	-
4th Year-Semester 8				
EE 4XX	Department Elective VI	x-x-x	3	-
EE 4XX	Department Elective VII	x-x-x	3	-
ZZ 4xx	Institute Elective IV	x-x-x	3	-
ZZ 4xx	Institute Elective V	x-x-x	3	-
ZZ 4xx	Institute Elective VI	x-x-x	3	-
	Total		15	-
<u>Elective Courses</u>				
EE 211	Applied Probability for Communication Engineering	2-1-0	3	Approved. (As per the comments of Chairman, Senate, the title of the course has been changed from 'Probability Theory and Random Variables' to 'Applied Probability for Communication Engineering'.) The syllabus of this course was inadvertently not attached in the Senate annexure-40.5 of the circulated agenda but it was presented during this Senate Meeting. The syllabus of EE 211: "Applied Probability for Communication Engineering" that was presented in the Senate meeting on 25.01.2024 is attached herewith as Annexure-1.



EE 213	Optimization Fundamentals for Electrical Engineering	2-1-0	3	In principle the course title and the L-T-P-C was approved. The detailed syllabus will be put up for discussion in the subsequent Senate meetings.
EE 214	Electronic Instrumentation	2-1-0	3	Approved (As per the comments of Chairman, Senate, the title of the course has been changed from 'Electronic Measurements and Instruments' to 'Electronic Instrumentation'.)
EE 216	Machine Learning for Signal Processing	2-1-0	3	Approved (As per the comments of Chairman, Senate, the title of the course has been changed from 'Introduction of Machine Learning' to 'Machine Learning for Signal Processing'.)
EE 319	Design and Analysis of Communication Networks	2-1-0	3	Approved
EE 321	Design of Photovoltaic Systems	2-1-0	3	In principle the course Title and the L-T-P-C was approved. The detailed syllabus will be put up for discussion in some of the subsequent Senate meetings.
EE 312	Microwave and Satellite Communication	2-1-0	3	Approved
EE 314	Restructured Power Systems	2-1-0	3	Approved (As per the comments of Chairman, Senate, the title of the course has been changed from 'Restructured Power Systems: Operating and Trading' to 'Restructured Power Systems')
EE 316	RF Devices for Guided and Wireless Transmission	2-1-0	3	Approved
EE 410/ EE 610	Power Electronics Applications to Power Transmission	2-1-0	3	Already approved
EE 422/622	Digital Circuit Design	2-1-0	3	Already approved
EE 426/626	MOSFET Reliability Issues	2-1-0	3	Already approved



EE 428/628	Advanced Memory Technology	2-1-0	3	Already approved
EE 434/634	Semiconductor Based Sensors	2-1-0	3	Already approved
EE 438/638	System on Programmable Chip Design	2-0-2	3	Already approved
EE 440/640	Analog and Mixed Signal IC Design	2-1-0	3	Already approved
EE 446 / EE 646	Information and Coding Theory	2-1-0	3	Already approved
EE 447/647	Advanced Photonics	2-1-0	3	Already approved
EE 448 / 648	Antennas and Propagation	3-0-0	3	Already approved
EE 450N/650 N	IoT Communication Networks	2-1-0	3	Already approved

ITEM: 40.6: Any other item with the permission of the Chair.
Nil.



(Professor Suhas S. Joshi)
Director and Chairperson, Senate




(Mr. S. P Hota)
Registrar and Secretary, Senate



Course code	EE 211
Title of the course	Applied Probability for Communication Engineering
Course Category	Departmental Elective
Credit Structure	L-T-P-C (2-1-0-3)
Name of the Concerned Department	Electrical Engineering
Pre-requisite, if any	None
Course Objectives	• Familiarization with the key concepts in probability theory and random variables. • Connection of concepts with various examples in real-life and applications in communications.
Course Outcomes	• Application of various concepts in probability and random variables in solving communication systems problems. • Concepts implementation using software tools.
Course Content	• Applications of Probability Concepts in Communication Systems. • Set operations, Probability space, Conditional probability, Bayes theorem. • Discrete random variables, Probability mass function (PMF), Cumulative distribution function (CDF), Example distributions. • Continuous random variables, Probability density function (PDF), CDF, Example distributions. • Joint distributions, Moments of random variables, Moment generating function (MGF), Characteristic function of random variables. • Conditional distributions, densities, and moments. • Functions of one and two random variables. • Chebyshev inequality, Laws of large numbers, Central limit theorem (CLT) • Applications of Random Variables in Wireless Communications and its implementation using software tools.



Suggested Books	Text Books: 1. A. Papoulis and S.U. Pillai, Probability, Random Variables and Stochastic Processes, 4th edition, McGraw Hill Education, 2017, ISBN-13: 978-0070486584. 2. H. Hsu, Probability, Random Variables and Random Processes (Schaum's Outlines), McGraw Hill Education, 2017, ISBN-13: 978-0070589506. 3. S. Ross, A First Course in Probability, 9th edition, Pearson Education, 2019, ISBN-13 978-9353065607. Reference Books: 4. D. C. Montgomery and G. C Runger, Applied Statistics and Probability for Engineers, 6th Edition, Wiley, 2016. ISBN-13: 978-8126562947. 5. J. L Devore, Probability and Statistics for Engineering and the Sciences, 9th edition, Cengage: Metric Version, 2020, ISBN-13 978-9353506247.
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