

Indian Institute of Information Technology Allahabad

Department of Electronics and Communication Engineering

B.Tech ECE (Credits: 160)

(With effect from July 2026 batch)

NEP-2020- New Education Policy- 2020

L-T-P (hr)

Lecture-L: 1 Credit = 1 hr/ week

Tutorial-T: 1 Credit = 1 hr/week

Practical-P: 1 Credit = 2 hr/week

Self Study: 1 Credit = 1 hr/week

1. Degree: B.Tech ECE
2. Duration: The total duration of the program will be 4 years.

Type of Courses

Programme Core Course (PCC)
Programme Elective Course (PEC)
Open/School Elective (OE/SE) other than particular program
Multidisciplinary Minor (MDM)
Ability Enhancement Course (AEC-01)
Indian Language (AEC-02)
Entrepreneurship/Economics/ Management Courses
Indian Knowledge System (IKS)
Value Education Course (VEC)
Internship
Dissertation/Thesis
Community Engagement Activity (CEA)/Field Project
Co-curricular & Extracurricular Activities (CCA)

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Semester 1					Total Credit: 20
Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1	Engineering Physics	AS101	BSC	4	3-0-2-0
2	Linear Algebra	AS102	BSC	4	3-1-0-0
3	Problem Solving with Programming	IT101	ESC	5	3-0-4-0
4	Fundamentals of Electrical & Electronics Engineering	EC101	ESC	4	3-0-2-0
5	Technical Communication Skills	MS101	HSMC (AEC)	2	1-0-2-0
6	Constitution of India		HSMC (VEC)	1	1-0-0-0
	Universal Human Values				
	Professional Ethics				
	Art of Living				
Total				20	14-1-10-0
					25

Semester 2					Total Credit: 21
Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1	Electronic Workshop	EC102	VSEC	2	0-0-4-0
2	Digital Logic Design with HDL	EC103	PCC	3	2-0-2-0
3	Electronic Devices and Circuits	EC104	ESC	3	2-0-2-0
4	Electronic Measurements and Instrumentation	EC105	PCC	3	2-0-2-0
5	Data Structures and Algorithms	IT104	ESC	4	3-0-2-0
6	Network Synthesis & Analog Filters	EC106	PCC	3	2-1-0-0
7	Principles of Management	MS102	HSMC(AEC)	2	2-0-0-0
8	Constitution of India		HSMC(VEC)	1	1-0-0-0
	Environmental Studies				
	Professional Ethics				
	Physical Education (Sports)				
	Any Other				
Total				21	14-1-12-0
					27

Exit: After successful completion of the first two semesters, a student may opt for an exit (Certificate in ECE) as per the Ordinance. They need to complete 6 additional Skill-based credits offline in the summer before exit. The department will provide a list of such courses.

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Semester 3					Total Credit: 22	
Sl. No.	Course Name	Code	Type	Credit	Hours	
					L-T-P-S	
1	Electromagnetic Field and Waves	EC201	PCC	3	3-0-0-0	
2	Signal and Systems	EC202	PCC	4	3-1-0-0	
3	Analog Electronics & Linear ICs	EC203	PCC	4	3-0-2-0	
4	Microprocessor Interface and Programming	EC204	PCC	3	2-0-2-0	
5	Biology for Engineers	AS301	BSC	2	2-0-0-0	
6	Multi-Disciplinary Minor-1		MDM	3	3-0-0-0	
7	Entrepreneurship Development		HSMC (AEC)	2	2-0-0-0	
8	Community Services		HSMC (CEA)	1	0-0-0-1	
	NCC					
	NSS					
	Yoga					
	Unnat Bharat Abhiyaan					
	Ek Bharat Shreshtha Bharat					
	NGO					
	Prayas					
	Other Courses					
Total				22	18-1-4-1	
					24	

Semester 4					Total Credit: 24
Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1	Control Systems	EC205	PCC	4	3-0-2-0
2	Analog Communication	EC206	PCC	3	2-0-2-0
3	CMOS VLSI Design	EC207	PCC	3	2-0-2-0
4	Probability and Statistics	AS201	BSC	4	3-1-0-0
5	Antenna and Wave Propagation	EC208	PCC	4	3-0-2-0
6	Integrated Circuit Technologies	EC209	PCC	3	3-0-0-0
7	Multi-Disciplinary Minor-2		MDM	3	3-0-0-0
Total				24	19-1-8-0
					28

Exit: After successful completion of the four semesters, a student may opt for an exit (Diploma in ECE) as per the Ordinance. They need to complete 6 additional Skill-based credits offline in the summer before exit. The department will provide a list of such courses.

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Semester 5					Total Credit: 23
Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1	Digital Signal Processing	EC301	PCC	4	3-0-2-0
2	Embedded System Design	EC302	PCC	3	2-0-2-0
3	Microwave Engineering	EC303	PCC	4	3-0-2-0
4	Digital Communication	EC304	PCC	4	3-0-2-0
5	Elective-1	ECXXX	PEC	3	3-0-0-0
	A. Electrical Machines				
	B. Advanced Computer Architectures				
	C. AI & ML Techniques				
	D. Solid State Devices				
	E. Any Other				
6	Multi-Disciplinary Minor-3		MDM	3	3-0-0-0
7	Design Thinking and Innovation	EC305	HSMC (AEC)	2	1-0-2-0
Total				23	18-0-10-0
					28

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Semester 6					Total Credit: 18	
Sl. No.	Course Name	Code	Type	Credit	Hours	
					L-T-P-S	
1	Data Communication & Networking	EC306	PCC	3	2-0-2-0	
2	Mobile and Wireless Communication	EC307	PCC	3	2–0–2-0	
3	Elective-2 A. Power Electronics B. Testing & Verification C. Optical Communication D. Detection & Estimation Theory E. Physics of Nanoscale Devices F. Any Other	ECXXX	PEC	3	3–0–0-0	
4	Mini Project	EC308	ELC	4	0-0-8-0	
5	Multi-Disciplinary Minor-4		MDM	3	3–0–0-0	
6*	Indian language(I1-I10)		HSMC (AEC)	2	1-0-2-0	
	Sanskrit					
	(I2-I10)					
	Foreign language(F1-F10)					
	German					
	Japanese					
	French					
	(F4-F10)					
	Regional Language(R1-R10)					
	(R1-R10)					
Total				18	11-0-14-0	
					25	

Exit option: After successful completion of six semesters, a student may get an exit option (B.Sc Engg. In ECE) as per Ordinance after completion of the summer semester internship (3 credits) and additional 3 credit courses in summer.

***I1 to I10, F1 to F10 and R1 to R10 will be decided by the concerned department.**

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Summer Semester					Total Credit: 3
Sl. No.	Course Name	Code	Type	Credit	
1	Internship	EC402	ELC	3	Credit will be added in 7 th Sem.

Note: Internship will be evaluated in the beginning of seventh semester. Its credit and grades will be reflected in the 7th Semester Grade Sheet.

Semester 7					Total Credit: 18
Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1	Elective-3 A. Electrical Vehicles B. FPGA Architectures C. Image Processing & Image Vision D. Multiple Input-Multiple Output (MIMO) E. Low Power System Design F. Any Other	ECXXX	PEC	3	3-0-0-0
2	Elective-4 A. Radar & Satellite Communication B. MEMS C. Speech Processing D. Emerging Nanoscale Devices E. 6G & THz Communication F. Any Other	ECXXX	PEC	3	3-0-0-0
3	Open Elective-1		OEC	3	3-0-0-0
4	History of Indian Civilizations Kautilya's Arthashastra Vedic Mathematics Vedic Corpus Wisdom from the Ages Panini's Grammar X1 – X9		HSMC (IKS)	2	2-0-0-0
5	Internship (Summer Semester)	EC402	ELC	3	0-0-0-3
6	Minor Project	EC401	ELC	4	0-0-8-0
Total				18	11-0-8-3
					22

Semester 8					Total Credit: 14
S. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1	Major Project#	EC403	ELC	8	0-0-16-0 0-0-0-8**
2	Elective-5**	ECXXX	PEC	3	3-0-0-0 0-0-0-3**
3	Open Elective-II**		OEC	3	3-0-0-0 0-0-0-3**
Total				14	6-0-16-0/ 0-0-0-14 22/14

**8th Semester courses may be allowed to join via MOOC / NPTEL, etc. Major projects may be completed as Internship cum projects as per the following options:

For Major Project, the students will have 3 options:

Option 1- The student will do an internship in a company, and the same work will be presented as the project without concealing any code/module

Option 2- The student will do an internship in a company, but a separate project will be registered with the IIITA faculty in the department

Option 3- The student will opt for a project only with the IIITA faculty in the department.

LIST OF ELECTIVES

Total Credit: 21					
Sl. No.	Course Name	Code	Type	Credit	Hours
					L-T-P-S
1	Image and Video Processing	IT5504	PEC	3	3
2	Deep Learning	IT5505	PEC	3	3
3	Probabilistic Machine Learning and Graphical Model	IT5506	PEC	3	3
4	Optimization	IT5507	PEC	3	3
5	Deep Learning	IT5508	PEC	3	3
6	Robot Motion Control	IT5509	PEC	3	3
7	Foundations of Robotics	IT5510	PEC	3	3
8	Advanced Graphics & Animation	IT5511	PEC	3	3
9	Virtual Reality	IT5512	PEC	3	3
10	Software Design & Architecture	IT5513	PEC	3	3
11	Software Requirements and Estimation	IT5514	PEC	3	3
12	Software Testing and Quality Management	IT5515	PEC	3	3
13	Data Visualization	IT5516	PEC	3	3
14	Big Data Analytics	IT5517	PEC	3	3
15	Parallel and Distributed Computing	IT5518	PEC	3	3
16	Principles of Wireless Communications	IT5519	PEC	3	3
17	Cloud and Edge Computing	IT5520	PEC	3	3
18	Embedded Systems and IoT	IT5521	PEC	3	3
19	Information Security Laws and Regulations	IT5522	PEC	3	3
20	Network Security	IT5523	PEC	3	3
21	Cyber Physical System Security	IT5524	PEC	3	3
22	Visual Recognition	IT5525	PEC	3	3
23	Computer vision	IT5526	PEC	3	3

24	Natural Language Processing	IT5527	PEC	3	3
25	Database Security	IT5528	PEC	3	3
26	Blockchain Technology	IT5529	PEC	3	3
27	Remote Sensing and GIS	IT5530	PEC	3	3
28	Social Network Analysis	IT5531	PEC	3	3
29	Generative AI and LLMs	IT5532	PEC	3	3
30	Large Language Model Conditioned Human-Robot Interactions	IT5533	PEC	3	3
31	Distributed Systems	IT5534	PEC	3	3
32	Optimization	IT5535	PEC	3	3
33	Probabilistic Graphical Models	IT5536	PEC	3	3
34	Cyber Security and Digital Forensics	IT5537	PEC	3	3
35	OMICS	AS5501	PEC	3	3
36	Data Analytics Fundamentals for Biology	AS5502	PEC	3	3
37	Scripting and Computer Environments	AS5503	PEC	3	3
38	Next-Generation Sequencing Tools and Algorithms	AS5504	PEC	3	3
39	Data Engineering for Molecular Structure Prediction	AS5505	PEC	3	3
40	Circuits and Instrumentation for Biomedical Engineering	AS5506	PEC	3	3
41	Biomechanics	AS5507	PEC	3	3
42	Biosignal Processing	AS5508	PEC	3	3
43	Mathematics and Statistics for Biology	AS5509	PEC	3	3
44	Molecular Biology	AS5510	PEC	3	3
45	Anatomy & Physiology	AS5511	PEC	3	3
46	Advanced Medical Instrumentation	AS5512	PEC	3	3
47	Biomedical Imaging	AS5513	PEC	3	3
48	Solid State Devices	EC5503	PEC	3	3

49	Testing and Verification	EC5505	PEC	3	3
50	Analog Integrated Circuit Design	EC5506	PEC	3	3
51	Advanced Digital Communication	EC5507	PEC	3	3
52	Statistical Signal Analysis	EC5508	PEC	3	3
53	Radiating Systems	EC5509	PEC	3	3
54	Introduction to Machine Learning	EC5510	PEC	3	3
55	Principles of Wireless Communications	EC5511	PEC	3	3
56	Recent Advances in Machine Learning	EC5512	PEC	3	3
57	Hardware Design Methodology	EC5513	PEC	3	3
58	Physics of Nanoscale Devices	EC5514	PEC	3	3
59	Radar & Satellite Communication	EC5515	PEC	3	3
60	Micro-electromechanical Systems	EC5516	PEC	3	3
61	Speech Processing	EC5517	PEC	3	3
62	Emerging Nanoscale Devices	EC5518	PEC	3	3
63	6G & THz Communication	EC5519	PEC	3	3
64	RF Integrated Circuit Design	EC5520	PEC	3	3

Multidisciplinary Minor

Entrepreneurship & Innovation				
Semester	Course Code	Course Title	Credits	Hours
				L-T-P-S
III	MS2501	Fundamentals of Entrepreneurship	3	2-0-2-0
IV	MS2502	Social Entrepreneurship	3	2-0-2-0
V	MS2503	Entrepreneurial Finance	3	2-1-0-0
VI	MS2504	Innovation Management	3	2-0-2-0
VII	MS2505	Managing Corporate Entrepreneurship	3	2-0-2-0
		Total	15	

Economics & Finance for Engineers				
Semester	Course Code	Course Title	Credits	Hours
				L-T-P-S
III	MS2506	Indian Economics	3	2-0-2-0
IV	MS2507	Money and Banking	3	2-0-2-0
V	MS2508	Economics of Business Environment	3	2-1-0-0
VI	MS2509	Start-up Economics	3	2-0-2-0
VII	MS2510	Digital Economics	3	2-0-2-0
		Total	15	

Science of Happiness				
Semester	Course Code	Course Title	Credits	Hours
				L-T-P-S
III	CS2501	Introduction to Science of Happiness	3	2-0-2-0
IV	CS2502	Understanding Domains of Happiness	3	2-0-2-0
V	CS2503	Happiness Indices	3	2-1-0-0
VI	CS2504	Assessment of happiness	3	2-0-2-0
VII	CS2505	Independent Study of Science of Happiness	3	2-0-2-0
		Total	15	

Biological Data Analytics				
Semester	Course Code	Course Title	Credits	Hours
				L-T-P-S
III	AS2501	Proteomics and Genomics	3	2-0-2-0
IV	AS2502	Next Generation Sequencing	3	2-0-2-0
V	AS2503	Cheminformatics for Engineers	3	2-1-0-0
VI	AS2504	Systems Biology and Modeling	3	2-0-2-0
VII	AS2505	Molecular Structure Prediction	3	2-0-2-0
		Total	15	

Medical Diagnostics and Therapeutic Technology				
Semester	Course Code	Course Title	Credits	Hours
				L-T-P-S
III	AS2506	Basics of Human Anatomy & Physiology	3	2-0-2-0
IV	AS2507	Biomedical Instrumentation	3	2-0-2-0
V	AS2508	Bio-MEMs and Nanotechnology	3	2-1-0-0
VI	AS2509	Medical Imaging	3	2-0-2-0
VII	AS2510	Tissue engineering and Gene therapy	3	2-0-2-0
		Total	15	

Mathematical Analysis				
Semester	Course Code	Course Title	Credits	Hours
				L-T-P-S
III	AS2511	Real Analysis	3	3-0-0-0
IV	AS2512	Introduction to Topology	3	3-0-0-0
V	AS2513	Differential Geometry of Curves and Surfaces	3	3-0-0-0
VI	AS2514	Measure Theory	3	3-0-0-0
VII	AS2515	Functional Analysis	3	3-0-0-0
		Total	15	

Frontiers in Physics				
Semester	Course Code	Course Title	Credits	Hours
				L-T-P-S
III	AS2516	Light Matter Interaction	3	2-1-0-0
IV	AS2517	Physics of Space and Time	3	2-1-0-0
V	AS2518	Magnetic Materials and Applications	3	2-1-0-0
VI	AS2519	Quantum Materials & Devices	3	2-1-0-0
VII	AS2520	Green Energy Physics	3	2-1-0-0
		Total	15	