MANIPAL INSTITUTE OF TECHNOLOGY, BENGALURU

B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING Course Structure 2022

Year	THIRD SEMESTER						FOURTH SEMESTER					
	Subject Code	**Subject Name**	**L**	**T**	**P**	**C**	**Subject Code**	**Subject Name**	L	T	P	C
II	MAT_2122	Engineering Mathematics - III	2	1	0	3	MAT_2227	Engineering Mathematics - IV	2	1	0	3
	ECE_2121	Analog Electronic Circuits	4	0	0	4	ECE_2221	VLSI Design	4	0	0	4
	ECE_2122	Network Analysis	3	0	0	3	ECE_2222	Digital Signal Processing	3	0	0	3
	ECE_2123	Signals & Systems	3	0	0	3	ECE_2223	Analog Integrated Circuits	3	0	0	3
	ECE_2124	Digital System Design	3	0	0	3	ECE_2224	Microwave Engineering	3	0	0	3
	ECE_2125	Electromagnetic Waves	3	0	0	3	ECE_2225	Modern Control Theory	3	0	0	3
	ECE_2141	Digital System Design Lab	0	0	3	1	ECE_2241	VLSI Lab	0	0	3	1
	ECE_2142	Electronic Circuits Lab	0	0	3	1	ECE_2242	Electronic System Design Lab	0	0	6	2
			18	**1**	**6**	**21**			**18**	**1**	**9**	**22**
	Total Contact Hours (L + T + P)		**25**				**Total Contact Hours (L + T+ P)**		**28**			
	FIFTH SEMESTER						SIXTH SEMESTER					
III	HUM_3021	Engineering Economics and Financial Management	3	0	0	3	HUM_3022	Essentials of Management	3	0	0	3
	ECE_3121	Analog and Digital Communication	4	0	0	4	ECE_3221	Wireless Communication	3	0	0	3
	ECE_3122	Microprocessors	3	0	0	3	ECE ****	Flexible Core 2 (A2/ B2/ C2)	3	0	0	3
	ECE_3123	Communication Networks	3	0	0	3	ECE ****	Program Elective- I/ (Minor Specialization)	3	0	0	3
	ECE ****	Flexible Core 1 (A1/ B1/ C1)	3	0	0	3	ECE ****	Program Elective-II / (Minor Specialization)	3	0	0	3
	IPE_4302	Open Elective-1 Creativity, Problem Solving and Innovation	3	0	0	3	*** ****	Open Elective- 2	3	0	0	3
	ECE_3141	Digital Signal Processing Lab	0	0	3	1	ECE_3241	Communication Networks Lab	0	0	3	1
	ECE_3142	Microprocessor Lab	0	0	6	2	ECE_3242	Communication Systems Lab	0	0	3	1
			19	**0**	**9**	**22**			**18**	**0**	**6**	**20**
	Total Contact Hours (L + T + P)		**28**				**Total Contact Hours (L + T + P)**		**24**			
	SEVENTH SEMESTER						EIGHTH SEMESTER					
IV	ECE ****	Program Elective – III / (Minor Specialization)	3	0	0	3	ECE_4291	Industrial Training (MLC)				1
	ECE ****	Program Elective – IV/ (Minor Specialization)	3	0	0	3	ECE_4292	Project Work / Practice School				12
	ECE ****	Program Elective – V	3	0	0	3	ECE_4293	Project Work (B. Tech Honours) **				20
	ECE ****	Program Elective - VI	3	0	0	3	ECE ****	B Tech Honours (Theory 1)** (V Semester)				4
	ECE ****	Program Elective - VII	3	0	0	3	ECE ****	B Tech Honours (Theory 2)** (VI Semester)				4
	*** ****	Open Elective-3	3	0	0	3	ECE ****	B Tech Honours (Theory 3)** (VII Semester)				4
	ECE_4191	Mini Project (Minor Specialization) *				8						
			18	**0**	**0**	**18/26**						**13/33**
	Total Contact Hours (L + T + P)		**18**									

***Applicable to students who opted for minor specialization**

****Applicable to eligible students who opted for and successfully completed the B Tech – Honors requirements**

Flexible Core-A

ECE_3124 Digital Computer Architecture (A1)
ECE_3222: System on Chip Design (A2)

Flexible Core-B

ECE_3125: VLSI Testing and Testability (B1)
ECE_3223: RF Circuit Design (B2)

Flexible Core-C

ECE_3126: Satellite Communication (C1)
ECE_3224: Information Theory and Coding (C2)

Minor Specializations

I. Computational Intelligence

ELE_4409: Artificial Intelligence
ECE_4409: Machine Learning
ELE_4410: Soft Computing Techniques
ECE_4410: Computer Vision

II. Embedded System

ECE_4411: Embedded System Design
ELE_4411: FPGA Based System Design
ECE_4412: Internet of Things
ELE_4412: Real Time Systems

III. Signal Processing

ECE_4413: Advanced Digital Signal Processing
ELE_4413: Linear Algebra for Signal Processing
ECE_4414: Digital Speech Processing
ELE_4414: Digital Image Processing

IV. Communication Systems

ECE_4401: Machine Learning for Communication system
ECE_4402: B5G Communication Systems
ECE_4403: Photonic communication system
ECE_4404: Satellite based Wireless Communication

V. VLSI Design

ECE_4405: Low Power VLSI Design
ECE_4406: MOS Device Modelling
ECE_4407: Digital Design Verification
ECE_4408: Analog IC Design

Other Programme Electives

ECE_4441: 5G: Fundamentals and Architectures
ECE_4442: Antenna for 5G and beyond networks
ECE_4443: Bioinspired and Evolvable Systems
ECE_4444: BioMEMS and Micro sensors
ECE_4445: CMOS Mixed Signal VLSI Design
ECE_4446: Data Analytics and Visualization
ECE_4447: Data Structures and Algorithms
ECE_4448: Electronic Instrumentation
ECE_4449: Embedded Operating Systems and RTOS
ECE_4450: Embedded Programming
ECE_4451: Error Control Coding
ECE_4452: Flexible Electronics
ECE_4453: Hardware for Machine Learning
ECE_4454: Microwave Integrated Circuits
ECE_4455: Modern Computer Architecture and Organization
ECE_4456: Motion & Geometry based methods in Computer Vision
ECE_4457: Nano devices & Nano sensors
ECE_4458: Nature Inspired Algorithms, Tools and Applications
ECE_4459: Neuromorphic VLSI Circuits
ECE_4460: Number theory and Cryptography.
ECE_4461: Object Oriented Programming Using C++
ECE_4462: Optical Wireless Communication
ECE_4463: PCB and System Design
ECE_4464: Power Electronics
ECE_4465: Radar and Navigation Systems
ECE_4466: Semiconductor Device Modelling
ECE_4467: Spintronic VLSI
ECE_4468: Spread Spectrum Communication
ECE_4469: Switching Theory for Logic Synthesis
ECE_4470: Time Frequency and Wavelet Transforms
ECE_4471: VLSI Process Technology
ECE_4472: Wireless cellular and LTE 4G broadband
ECE_4473: Wireless Sensor Networks

Open Electives

ECE_4311: Consumer Electronics
ECE_4312: Electronic Product Design & Packaging
ECE_4313: Introduction to Communication Systems
ECE_4314: MEMS Technology
ECE_4315: Introduction to Nano science & Technology
ECE_4316: Basics of Building Automation Systems
ECE_4317: Intelligent Instrumentation System
ECE_4318: Computational Intelligence and Environmental Sustainability
ECE_4319: Applications of Signal Processing
ECE_4320: Introduction to Biosensors
ECE_4321: Machine Learning in VLSI Computer Aided Design