MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

B Tech Curriculum – 2022

Department of Electronics and Communication Engineering

Course structure: III SEMESTER TO VIII SEMESTER:

Year	THIRD SEMESTER						FOURTH SEMESTER					
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
II	MAT xxxx	MATHEMATICS -III	3	0	0	3	MAT xxxx	MATHEMATICS-IV	2	1	0	3
	ECE xxxx	ANALOG ELECTRONIC CIRCUITS	4	0	0	4	ECE xxxx	VLSI DESIGN	4	0	0	4
	ECE xxxx	NETWORK ANALYSIS	3	0	0	3	ECE xxxx	DIGITAL SIGNAL PROCESSING	3	0	0	3
	ECE xxxx	SIGNALS & SYSTEMS	3	0	0	3	ECE xxxx	ANALOG INTEGRATED CIRCUITS	3	0	0	3
	ECE xxxx	DIGITAL SYSTEM DESIGN	3	0	0	3	ECE xxxx	MICROWAVE ENGINEERING	3	0	0	3
	ECE xxxx	ELECTRO MAGNETIC WAVES	3	0	0	3	ECE xxxx	MODERN CONTROL THEORY	3	0	0	3
	ECE xxxx	DIGITAL SYSTEM DESIGN LAB	0	0	3	1	ECE xxxx	VLSI LAB	0	0	3	1
	ECE xxxx	ELECTRONIC CIRCUITS LAB	0	0	3	1	ECE xxxx	ELECTRONIC SYSTEM DESIGN LAB	0	0	6	2
						21*						**22***
	Total Contact Hours (L + T + P)						**Total Contact Hours (L + T + P)**					

B Tech in ECE

Year	FIFTH SEMESTER						SIXTH SEMESTER					
	Sub. Code	**Subject Name**	**L**	**T**	**P**	**C**	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
III	HUM xxxx	ENGG ECONOMICS & FIANACIAL MANAGEMENT	3	0	0	3	HUM xxxx	ESSENTIALS OF MANAGEMENT	3	0	0	3
	ECE xxxx	ANALOG AND DIGITAL COMMUNICATION	4	0	0	4	ECE xxxx	WIRELESS COMMUNICATION	3	0	0	3
	ECE xxxx	MICROPROCESSORS	3	0	0	3	ECE xxxx	**Flexible Core** – (System on Chip Design/ RF Circuit Design / Information Theory and Coding)	3	0	0	3
	ECE xxxx	COMMUNICATION NETWORKS	3	0	0	3	ECE xxxx	PE – 1 / Minor Specialization	3	0	0	3
	ECE xxxx	**Flexible Core** – (Digital Computer Architecture/ VLSI Testing and Testability / Satellite Communication)	3	0	0	3	ECE xxxx	PE – 2 / Minor Specialization	3	0	0	3
	IPE xxxx	*OE – Creativity, Problem Solving and Innovation (MLC) - mandatory	3	0	0	3	**ZZZ** xxxx	OE – 1** (MLC)	3	0	0	3
	ECE xxxx	DIGITAL SIGNAL PROCESSING LAB	0	0	3	1	ECE xxxx	COMMUNICATION NETWORKS LAB	0	0	3	1
	ECE xxxx	MICROPROCESSOR LAB	0	0	6	2	ECE xxxx	COMMUNICATION SYSTEMS LAB	0	0	3	1
						22						**20**
	Total Contact Hours (L + T + P)						**Total Contact Hours (L + T + P)**					

*Credit earned in the first year

** Performance of students to be recorded in Eighth semester grade sheet.

B Tech in --ECE

Year	SEVENTH SEMESTER						EIGHTH SEMESTER					
	Sub. Code	**Subject Name**	**L**	**T**	**P**	**C**	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
IV	ECE xxxx	PE – 3 / Minor Specialization	3	0	0	3	ECE xxxx	Industrial Training (MLC)				1
	ECE xxxx	PE – 4 / Minor Specialization	3	0	0	3	ECE xxxx	Project Work				12
	ECE xxxx	PE – 5	3	0	0	3	ECE xxxx	Project Work (B Tech – honours)* (V - VIII sem)				20
	ECE xxxx	PE – 6	3	0	0	3	ECE xxxx	B Tech – honours Theory – 1* (V semester)				4
	ECE xxxx	PE - 7	3	0	0	3	ECE xxxx	B Tech – honours Theory – 2* (VI semester)				4
	ZZZ xxxx	OE – 2** (MLC)	3	0	0	3	ECE xxxx	B Tech – honours Theory – 3* (VII semester)				4
	ECE xxxx	Mini Project (Minor specialization)***				8						
						18/26* **						**13/33***
	Total Contact Hours (L + T + P)						**Total Contact Hours (L + T + P)**					

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

** Performance of students to be recorded in Eighth semester grade sheet.

***Applicable to students who opted for minor specialization

Minor Specializations

I. Computational Intelligence
(Common to Electrical Sciences)
ELE xxxx Artificial Intelligence
ECE xxxx: Machine Learning
ELE xxxx Soft Computing Techniques
ECE xxxx: Computer Vision

II. Embedded System
(Common to Electrical Sciences)
ECE xxxx: Embedded System Design
ELE xxxx: FPGA based System Design
ECE xxxx: Internet of Things
ELE xxxx: Real Time Systems

III. Signal Processing
(Common to Electrical Sciences)
ECE xxxx: Advanced Digital Signal Processing
ELE xxxx: Linear Algebra for Signal Processing
ECE xxxx: Digital Speech Processing
ELE xxxx: Digital Image Processing

IV. Communication Systems (Exclusively for ECE)
ECE-xxxx: Machine Learning for Communication system
ECE-xxxx: B5G Communication Systems
ECE xxxx: Photonic communication system
ECE xxxx: Satellite based Wireless Communication

V. VLSI Design
(Common to Electrical Sciences)
ECE xxxx: Low Power VLSI Design
ECE xxxx: MOS Device Modelling
ECE xxxx: Digital Design Verification
ECE xxxx: Analog IC Design

VII. Control Systems
(Common to Electrical Sciences)
ICE xxxx: Robust Control
ICE xxxx: Digital Control Systems
ICE xxxx: Non-Linear Control Systems
ICE xxxx: System Identification

VIII. Sensor Technology
(Common to Electrical Sciences)
ICE xxxx : Micro Electro Mechanical Systems
ICE xxxx: Multi Sensor Data Fusion
ICE xxxx: Smart Sensors
ICE xxxx : Advanced Sensor Technology

IX. Illumination Technology
(Common to Electrical Sciences)
ELE xxxx : Lighting Science : Devices and Systems
ELE xxxx: Integrated Lighting Design
ELE xxxx : Solid State Lighting
ELE xxxx: Lighting Controls: Technology & Applications

X. Electric Mobility
(Common to Electrical Sciences)
ELE xxxx: Introduction to Electric Vehicles
ELE xxxx :Energy storage and management in EVs
ELE xxxx: Electric Vehicle Grid Integration and Control
ELE xxxx: EV Data Analysis

Xl. Computational Mathematics
MAT xxxx: Applied Statistics and Time Series Analysis
MAT xxxx: Computational Linear Algebra
MAT xxxx: Computational Probability and Design of Experiments
MAT xxxx: Graphs and Matrices

Other Programme Electives

ECE xxxx : Data Structures and Algorithms
ECE xxxx: Data Analytics and Visualization
ECE xxxx: Error Control Coding
ECE xxxx: Number theory and Cryptography.
ECE xxxx: Electronic Instrumentation
ECE xxxx: PCB and System Design
ECE xxxx: Flexible Electronics
ECE xxxx: Microwave Integrated Circuits
ECE xxxx: Motion & Geometry based methods in Computer Vision
ECE xxxx: Embedded Operating Systems and RTOS
ECE xxxx: Wireless cellular and 4TE 4G broadband
ECE xxxx: Power Electronics
ECE xxxx: Time Frequency and Wavelet Transforms
ECE xxxx: VLSI Process Technology
ECE xxxx: Wireless Sensor Networks
ECE xxxx: Modern Computer Architecture and Organization
ECE xxxx: BioMEMS and Micro sensors
ECE xxxx: Spintronic VLSI
ECE xxxx: Hardware for Machine Learning
ECE xxxx: Bio Inspired and Evolvable Systems
ECE xxxx: Nature Inspired Algorithms, Tools and Applications
ECE xxxx: Nano devices & Nano sensors
ECE xxxx: Neuromorphic VLSI Circuits
ECE xxxx: Antenna for 5G and beyond networks
ECE xxxx : CMOS Mixed Signal VLSI Design
ECE xxxx: Switching Theory for Logic Synthesis
ECE xxxx: Object Oriented Programming Using C++
ECE xxxx: Radar and Navigation Systems
ECE xxxx: Optical Wireless Communication
ECE xxxx: 5G: Fundamentals and Architectures
ECE xxxx: Embedded Programming

ECE xxxx: Spread Spectrum Communication

VI. Business Management HUM-xxxx: Financial Management HUM-xxxx: Human Resource Management HUM-xxxx: Marketing Management HUM-xxxx: Operation Management	XIV. Financial Management (4 Courses) XVI. Financial Technology (4 courses) XVII.Entrepreneurship (4 courses) XIII. People Management (4 courses) XIX. Literatures in English (4 courses)	ECE xxxx: Semiconductor Device Modelling **<u>Open Electives offered by ECE Dept</u>** ECE xxxx : Consumer Electronics ECE xxxx : Electronic Product Design & Packaging ECE xxxx: Introduction to Communication Systems ECE xxxx: MEMS Technology ECE xxxx: Introduction to Nano science & Technology ECE xxxx: Basics of Building Automation Systems ECE xxxx: Intelligent Instrumentation System ECE xxxx: Computational Intelligence and Environmental Sustainability ECE xxxx: Applications of Signal Processing ECE xxxx: Introduction to Biosensors ECE xxxx: Machine Learning in VLSI Computer Aided Design