M.Tech. in Electronics & Communication Engineering (ECE)

University-Style Syllabus (2 Years / 4 Semesters)

Programmer Duration: 2 Years (4 Semesters)
Programmer Level: Postgraduate (M.Tech.)
Credits: 68–80 (Typical AICTE/NEP Pattern)

Semester I

Subject Code	Subject	L	T	P	Credits
MEC101	Advanced Digital Signal Processing	3	1	0	4
MEC102	Advanced Communication Systems	3	1	0	4
MEC103	VLSI Design and Technology	3	0	2	4
MEC104	Research Methodology	2	0	2	3
MEC105	Electronics & Communication Laboratory – I	0	0	4	2
MEC106	Seminar – I	0	0	2	1

Total Credits: 18

Semester II

Subject Code	Subject	L	T	P	Credits
MEC201	Wireless and Mobile Communication	3	1	0	4
MEC202	Embedded Systems Design	3	0	2	4
MEC203	Optical Fiber Communication	3	0	2	4

Subject Code	Subject	L	T	P	Credits
MEC204	Microwave and Radar Engineering	3	0	2	4
MEC205	Electronics & Communication Laboratory – II	0	0	4	2
MEC206	Seminar – II	0	0	2	1

Total Credits: 19

Semester III

Subject Code	Subject	L	T	P	Credits
MEC301	Internet of Things (IoT)	3	1	0	4
MEC302	Artificial Intelligence for Signal Processing	3	0	2	4
MEC303	Advanced Antenna and Wave Propagation	3	0	2	4
MEC304	Elective – I	3	0	0	3
MEC305	Dissertation Phase – I	0	0	12	8

Elective – I (Choose One)

- MEC311 – Satellite Communication
- MEC312 – FPGA-Based System Design
- MEC313 – Nano Electronics
- MEC314 – Biomedical Signal Processing
- MEC315 – RF and Microwave Circuit Design

Total Credits: 23

Semester IV

Subject Code	Subject	L	T	P	Credits

Subject Code	Subject	L	T	P	Credits
MEC401	Dissertation Phase – II	0	0	24	16
MEC402	Viva Voce	0	0	2	2
MEC403	Industrial Internship	0	0	8	4

Total Credits: 22

Laboratory Courses

Code	Laboratory
MEC105	Electronics & Communication Laboratory – I
MEC205	Electronics & Communication Laboratory – II
MEC305	Research and Dissertation Work
MEC401	Dissertation and Project Implementation

Detailed Unit-Wise Syllabus

MEC101 – Advanced Digital Signal Processing

Unit I

- Discrete-Time Signals and Systems
- Z-Transform Review

Unit II

- FIR and IIR Filter Design

Unit III

- MultiMate Signal Processing

Unit IV

- Adaptive Signal Processing

Unit V

- DSP Applications in Communication and Multimedia

MEC102 – Advanced Communication Systems

Unit I

- Digital Communication Techniques

Unit II

- Error Control Coding

Unit III

- OFDM and MIMO Systems

Unit IV

- 4G, 5G and Beyond

Unit V

- Software Defined Radio

MEC202 – Embedded Systems Design

- ARM Cortex Architecture
- Embedded C Programming
- Real-Time Operating Systems (RTOS)
- Embedded Linux
- Embedded System Applications

MEC203 – Optical Fiber Communication

- Optical Fiber Fundamentals
- Fiber Optic Cables
- Optical Transmitters and Receivers
- WDM Systems
- Optical Networks

Practical List

Students should perform practical exercises such as:

- DSP Algorithm Implementation using MATLAB/Python
- FPGA Programming using Virology/VHDL
- ARM Microcontroller Programming
- RTOS-Based Embedded Application Development
- Optical Fiber Communication Experiments
- Antenna Design and Simulation
- IoT System Development
- Signal Analysis using MATLAB
- Wireless Communication Simulation
- PCB Design using EDA Tools
- VLSI Circuit Simulation
- Industry-Oriented Capstone Project

Examination Scheme

Component	Marks
End Semester Examination	70
Internal Assessment	30
Practical Examination	100
Seminar	100
Dissertation	300

Component	Marks
Viva Voce	100

Recommended Reference Books

- Digital Signal Processing
- Communication Systems
- CMOS VLSI Design
- Embedded Systems Architecture
- Optical Fiber Communications

Programmer Outcomes

Upon successful completion of the programmer, graduates will be able to:

1. Design and analyze advanced electronic and communication systems.
2. Develop embedded systems and IoT-based applications.
3. Apply DSP, VLSI, wireless, and optical communication concepts to solve engineering problems.
4. Design RF, microwave, and antenna systems.
5. Conduct advanced research in Electronics and Communication Engineering.
6. Develop innovative hardware and communication technologies.
7. Lead multidisciplinary engineering projects in industry and academia.
8. Pursue doctoral research or advanced professional careers in Electronics and Communication Engineering.