

Master of Science (Electrical Engineering)

MS(EE)

1. Mission Statement:

The mission of the Electrical Engineering Department is to provide quality education to prepare students who will play a significant role in shaping the future high technology environment, and to provide knowledge and skills to foster lifelong learning.

2. Program Objectives:

The objectives of the Master of Science in Electrical Engineering Program are to enhance the student's ability to be successful and advance in their chosen careers in industry, academia, and public institution, and to make significant contributions to the field of electrical engineering.

The above objectives are achieved by providing the students:

- Advanced knowledge and skills of EE subjects and practices based upon advanced knowledge of mathematics, including in-depth knowledge in at least one area of EE, so as to maintain high employability, and an ability to adapt to, develop and apply new technology
- Enhance foundation for enduring learning
- Improved communication skills

3. Eligibility:

- Bachelor of Science in Electrical Engineering related disciplines such as: Electrical Power Engineering, Electronics Engineering, Communications or Telecommunications Engineering, and Computer Engineering or equivalent from an accredited institution with minimum CGPA of 2.5 out of 4.0.
- Graduates from other engineering disciplines may be eligible for this program, subject to passing the prerequisite courses with minimum GPA of 3.0 out of 4.0 in each course, as recommended by the departmental graduate committee at admission time.
- Graduates with a 16-year degree in Computer Science, Electronics, Physics or any related discipline may be eligible for this program, subject to passing the prerequisite courses with minimum GPA 3.0 of 4.0 in each course, as recommended by the departmental graduate committee at admission time.

4. Duration of the Program:

The duration of studies for MS Electrical Engineering shall not be less than two years and not more than 3years.

5. Specializations:

MS in Electrical Engineering (MSEE) includes the following specializations or major areas:

- Automation and Control
- Computer and Digital Systems
- Power Systems
- Telecommunications

5.1 Automation and Control:

The automation and control specialization aims to provide the graduates with sound engineering knowledge and broad professional skills to design, develop, implement, manage and supervise automation systems for different engineering applications.

5.2 Computer and Digital Systems:

Computer and Digital Systems specialization deals with the design, development, testing, and evaluation of components, systems, and networks. Research in Computer Engineering strives to achieve higher performance in the systems and components that are built as well as in the design process. The goal of this research area is to develop a comprehensive understanding of the hardware and software technologies used in computing systems.

5.3 Power Systems:

The power system engineering program actively pursues research in the areas of system reliability and performance modeling and prediction, system protection and automation, system control and stability, large-scale system computational methodologies and power electronics. The program will also focus on the renewable energy options available, and would also give a chance of research in the non-conventional energy methods.

5.4 Telecommunications:

Research in telecommunications is concerned with efficient representation, storage, transmission, processing, routing and reception of information from a wide variety of sources. The range in research will be from the highly-mathematical, to applied algorithm design, experimental prototyping, and contributions to emerging industry standards. In signal processing, the research will span a wide range of areas of signal processing including signal processing for communications, speech processing for recognition and synthesis, multimedia signal processing and compression, medical imaging, optical information processing, array/distributed/collaborative signal processing, immersive audio, speech processing for recognition and synthesis, and other multimedia related technologies such as content-based representation and retrieval.

6 MS Program Requirements and Structure:

The MS Electrical Engineering program requirement is 30 credit hours. The students have two options to complete their degree, Thesis and Non-Thesis.

6.1 Thesis Option:

The requirement is minimum 24 credit hours of course work and 06 credit hours of thesis involving research work.

6.2 Non-Thesis Option:

The requirement is minimum 30 credit hours of course work.

A student may complete 30 credit hours of course work and also complete 06 credit hours of MS Thesis. In such cases, additional course work will be considered as non-credit. A student, who registers for thesis, may still choose to complete degree requirements through course work option only by taking additional courses with the approval of the departmental graduate committee. The student will be eligible for the award of the degree whenever he/she completes the program requirements through any of the options as specified above.

7 Semester Roadmap for MSEE:

Semester – I

i.	Stochastic Systems (Core-I)
ii.	Core – II
iii.	Elective – I

Semester – II

i.	Core-III
ii.	Core – IV
iii.	University Requirement

Semester – III

i.	Core – V
ii.	Elective – II / Thesis

Semester – IV

i.	Elective – III
ii.	Elective –IV / Thesis

8 Core Courses:

University Requirement

Research Methodology' is included as university requirement for all graduate programs in the faculty of Engineering and Sciences.

Sr. No.	Course Code	Core Course Title	Credit Hours
1.	ESC-501	Research Methodology	3

The core courses for all the three specializations are listed below. All the registered students have to pass all the core courses of their respective domain.

8.1 Automation and Control:

Sr. No.	Course Code	Core Course Title	Credit Hours
1.	EEN-501	Stochastic Systems	3
2.	EEN-524	Electronic Design and Analysis	3
3.	EEN-725	Advanced Digital Signal Processing	3
4.	EEA-540	Mechatronics	3
5.	EEA-567	Modern Control Theory	3

8.2 Computer and Digital Systems:

Sr. No.	Course Code	Core Course Title	Credit Hours
1.	EEN-501	Stochastic Systems	3
2.	CEN-540	Embedded Systems	3
3.	CEN-720	Advanced Computer Architecture	3
4.	CEN-742	Advanced Digital System Design	3
5.	CSC-502	Information Systems	3

8.3 Power Systems:

Sr. No.	Course Code	Core Course Title	Credit Hours
1.	EEN-501	Stochastic Systems	3
2.	EEP-502	Advanced Power System Operation and Control	3
3.	EEP-514	Renewable Energy	3
4.	EEP-558	Power Transmission and Distribution	3
5.	EEP-559	Power Generation and Plant Operation	3

8.4 Telecommunications:

Sr. No.	Course Code	Core Course Title	Credit Hours
1.	EEN-501	Stochastic Systems	3

2.	EEN-725	Advanced Digital Signal Processing	3
3.	EET-511	Digital Communication Systems	3
4.	EET-553	Information Theory and Coding	3
5.	EET-555	Wireless and Mobile Communications	3

9 Elective Courses:

The elective courses for all the four specializations are listed below. The students opting Thesis option have to choose 2 courses, while the students following Non-Thesis option have to complete 4 courses. The students can choose maximum of 2 courses from other domains, which requires prior permission from the departmental graduate committee.

The elective course offering in each semester is discretion of the department.

9.1 Automation and Control:

Sr. No.	Course Code	Elective Course Title	Credit Hours
1.	EEN-506	Solid State Devices	3
2.	EEN-509	Non-Linear Control Systems	3
3.	EEN-523	Electronic Instruments	3
4.	EEA-713	Robust Multivariable Control systems	3
5.	EEA-714	Automation and Robotics	3
6.	EEA-740	Advanced Mechatronics Systems	3
7.	EEA-741	Advanced Topics in Industrial Automation	3
8.	CSC 749	Advanced Neural Networks and Fuzzy Logic	3
9.	EET-712	Advanced Power Electronics	3
10.	CEN-507	Embedded Control Systems	3
11.	CEN-508	Distributed Control Systems	3
12.	CEN-722	Advanced Interfacing Techniques	3
13.	CEN-758	Robotics and Intelligent sensors	3

9.2 Computer and Digital Systems:

Sr. No.	Course Code	Elective Course Title	Credit Hours
1.	EEN-727	DSP Systems Design	3
2.	EEA-702	Advanced Topics in Control Systems	3
3.	EET-704	Advanced Topics in Information Systems	3
4.	CEN-521	Microprocessor/Microcontroller Based Systems	3
5.	CEN-523	Compiler Design	3
6.	CEN-541	ASIC and FPGA Design	3
7.	CEN-542	Embedded Software and RTOS	3
8.	CEN-553	Real Time Computer Systems	3
9.	CEN-720	Advanced Operating Systems	3
10.	CEN-721	Advanced Microprocessor Systems	3
11.	CEN-739	Embedded Computing Systems	3

12.	CEN-752	Advanced VLSI System Design	3
13.	CEN-753	Design of Real Time Embedded Systems	3
14.	CEN-755	Parallel Processing Computer Systems	3

9.3 Power Systems:

Sr. No.	Course Code	Elective Course Title	Credit Hours
1.	EEN-506	Solid State Devices	3
2.	EEP-512	Power Electronics Design	3
3.	EEP-516	Solar Power Generation	3
4.	EEP-517	Wind Power Generation	3
5.	EEP-518	Sustainable Energy Systems	3
6.	EEP-519	Hybrid Power Systems	3
7.	EEP-520	Photovoltaic System Design	3
8.	EEP-521	Design of Electrical Machines	3
9.	EEP-561	High Voltage Engineering Design	3
10.	EEP-564	Hydel Power Generation	3
11.	EEP-565	Integration of Distributed Generation	3
12.	EEP-566	Power System Reliability	3
13.	EEP-712	Advanced Power Electronics	3
14.	EEP-714	Advanced Topics in Renewable Energy	3
15.	EEP-716	Advanced Power System Analysis	3
16.	EEP-717	Advanced Power System Planning	3
17.	EEP-718	Advanced Power System Protection	3
18.	EEP-719	Advanced Topics in Power Systems Engineering	3
19.	EEP-720	Computer Methods in Power Systems	3
20.	EEP-721	Insulation Co-ordination in Power Systems	3
21.	EEP-723	Thermal and Nuclear Power Generation	3
22.	EEP-754	Smart Grid System Operation	3
23.	EEP-757	Non-Conventional Energy Systems	3
24.	EEP-780	EMS & SCADA	3

9.4 Telecommunications:

Sr. No.	Course Code	Course Title	Credit Hours
1.	EEN-740	Embedded System Design for Telecommunications	3
2.	EET-504	Wireless LANs	3
3.	EET-522	Communication System Design and Analysis	3
4.	EET-547	Advanced Radar Systems	3
5.	EET-548	Mobile Cellular Systems and Standards	3
6.	EET-549	Advanced Satellite Communications	3
7.	EET-552	Multimedia Networking	3
8.	EET-554	Wireless Networks	3
9.	EET-556	Mobile Communications and Networking	3
10.	EET-560	Telecommunication Network Management	3
11.	EET-701	Telecommunication Software Design	3
12.	EET-706	Advanced Optical Fiber Networks	3
13.	EET-750	Antennas Theory, Design and Applications	3
14.	EET-754	QoS Architectures for Multimedia Wireless Networks	3
15.	EET-755	Wireless Communication Techniques	3
16.	EET-756	Telecommunication Switching Systems	3
17.	EET-757	Mobile Computing	3
18.	EET-762	Communication Networks Architectures and Protocols	3
19.	EET-764	Queuing Theory for Performance Modeling	3
20.	EET-765	Radio Frequency Engineering	
21.	EET-766	RF System Engineering and Design	3
22.	EET-767	Wireless Mesh and Sensor Networks	3
23.	EET-768	Cognitive & Software Defined Radio	3
24.	EET-769	Mobile/Vehicular Ad Hoc Networks (MANETs/VANETs)	3
25.	CEN-745	Advanced Digital Image Processing	3