Updated October 8, 2024

Master of Engineering
Core Course in (Offered/other) Research Specializations
Fall 2024/Winter 2025/Not offered this year

Communications; Signal & Image Processing

At least four of the following courses:

1) ECE 502 A1 – Probability and Random Process for Electrical Engineering
2) ECE 540 – Detection and Estimation
3) ECE 541 B1 – Digital Signal Processing
4) ECE 577 – Antenna Theory and Design
5) ECE 582 A1 – Information Theory and Channel Coding
6) ECE 583 A1 – Digital Communications
7) ECE 644 – Digital Image and Video Processing
8) ECE 684 – Wireless Communication Systems
9) ECE 686 B1 – Wireless Communication Network
10) ECE 740 A01 – Computer and Robot Vision
10) ECE 740 A02 – Biomedical Image Analysis
11) ECE 740 B01 – Deep Learning for Computer Vision

Software Engineering & Intelligent Systems

At least four of the following courses:

1) ECE 522 A1/LAB D41 – Software Construction, Verification and Evaluation
2) ECE 582 A1 – Information Theory and Channel Coding
3) ECE 624 A1 – Fuzzy Set in Human Centric Computing
4) ECE 625 – Data Analysis and Knowledge Discovery
5) ECE 626 – Advanced Neural Networks
6) ECE 627 – Intelligent Web
7) ECE 710 – Wearable Device, IoT, Data Analysis
8) ECE 720 – Metaheuristic Optimization
9) ECE 720 A01 – Automated Software Testing, Debugging and Analysis
10) ECE 720 X51 - Trustworthy Machine Learning System Engineering
11) ECE 720 B01 – Robot Learning: Principles and Advances
12) ECE 740 A01 – Computer and Robot Vision
13) ECE 740 B01 – Deep Learning for Computer Vision

Integrated Circuits and Systems; Solid State Electronics; Computer Engineering

At least four of the following courses:

1) ECE 511 B01/LAB D51 – Advanced Digital Circuit and System Design
2) ECE 512 – Digital System Testing and Design
3) ECE 547 A1 – Fundamentals of Solid-State Devices
4) ECE 551 – Design CMOS Analog Integer Circuit
5) ECE 553 – Digital Integrated Circuit Design
6) ECE 558 – Microfabrication & Nanofabrication Topics I
7) ECE 559 B1 – Microfabrication & Nanofabrication Topics II
8) ECE 570 – Computational Electromagnetics

9) ECE 578 A1 – Microwave and Millimeter-wave Circuits
10) ECE 644 – Digital Image and Video Processing (only for Computer Engineering stream)
11) ECE 646 – Organic Electronics
12) ECE 650 – Radio Frequency Integrated Circuits
13) ECE 710 – Wearable Device, IoT, Data Analysis
14) ECE 720 – Metaheuristic Optimization
15) ECE 750 – Devices for Sensing Applications
16) ECE 750 – Nanobiotechnological Systems

Energy Systems

At least four of the following courses:

1) ECE 511 B01/LAB H51 – Advanced Digital Circuit and System Design
2) ECE 530 B01 – Power Qual/Dist Analysis
3) ECE 531 B1/LAB H51 – Industrial Drive Systems (Students who have taken ECE 432 are not allowed to take ECE 531)
4) ECE 560 A1 – Modern Control Theory
5) ECE 561 A1 – Nonlinear Control Systems
6) ECE 570 – Computational Electromagnetics
7) ECE 631 – High-Voltage DC (HVDC) Systems
8) ECE 633 B1 – Modeling and Simulation of Electromagnetics Transient in Electrical Circuit
9) ECE 635 – Power Converter Renewable Energy System
10) ECE 636 A1 – Voltage Source Converters
11) ECE 730 A01– Smart Grid Fundamentals
12) ECE 730 B1 – Applied Nuclear Energy
13) ECE 730 – Power Converter System Design

Control Systems

At least four of the following courses:

1) ECE 560 A1 – Modern Control Theory
2) ECE 561 A1– Nonlinear Control Systems
3) ECE 660 B1 – Optimization in Dynamic Control and Estimation
4) ECE 664 B1 – Nonlinear Control Design with Application
5) ECE 665 – Multivariable Robust Control
6) ECE 740 – Computer and Robot Vision
7) ECE 760 – Robotics: Modeling, Learning and Control
8) CH E 662 – Process Identification
9) CH E 694 X50 – Optimal Control

Electromagnetics & Microwaves

1) ECE 570 – Computational Electromagnetics
2) ECE 576 – Advanced Engineering Electromagnetics
3) ECE 577 – Antenna Theory and Design
4) ECE 578 A1 – Microwave and Millimeter-wave Circuits

Biomedical Engineering

1) ECE 644 B1 – Digital Image and Video Processing
2) ECE 691 – Biomedical Optics
3) ECE 692 B01 – Ultrasound Imaging

4) ECE 710 – Wearable Device, IoT, Data Analysis
5) ECE 740 – Biomedical Image Analysis
6) ECE 740 B01 – Deep Learning for Computer Vision

Photonics & Plasmas; Microsystems & Nanodevices

1) ECE 558 – Microfabrication & Nanofabrication Topics I
2) ECE 559 B1 – Microfabrication & Nanofabrication Topics II
3) ECE 571 – Optical & Quantum Electronics
4) ECE 572 B1 – Nonlinear Optics
5) ECE 730 B1 – Applied Nuclear Energy
6) ECE 675 A1 – Plasma Engineering
7) ECE 770 A01 – An Introduction to Laser-Plasma Interactions
8) ECE 770 – Nanoscale Optics
9) ECE 770 – Optics for Microsystems
10) ECE 770 – Silicon Photonic Integrated Circuits