Updated July 24, 2023

Master of Engineering
Core Course in (Offered/other) Research Specializations
Fall 2023/Winter 2024/Not offered this year

Communications; Signal & Image Processing

At least four of the following courses:

1) ECE 502 – 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 – Information Theory and Channel Coding
6) ECE 583 – Digital Communications
7) ECE 644 – Digital Image and Video Processing
8) ECE 684 – Wireless Communication Systems
9) ECE 686 – Wireless Communication Network
10) ECE 740 A01 – Computer and Robotic Vision
10) ECE 740 A03 – Biomedical Image Analysis
11) ECE 740 B01 – Deep Learning in Computer Vision

Software Engineering & Intelligent Systems

At least four of the following courses:

1) ECE 522 – Software Construction, Verification and Evaluation
2) ECE 624 – Fuzzy Set in Human Centric Computing
3) ECE 625 – Data Analysis and Knowledge Discovery
4) ECE 626 – Advanced Neural Networks
5) ECE 627 – Intelligent Web
6) ECE 710 B01 – Wearable Device, IoT, Data Analysis
7) ECE 720 A02 – Metaheuristic Optimization
8) ECE 720 X50 – Machine Learning System Engineering
9) ECE 740 A01 – Computer and Robot Vision
10) ECE 740 B01 – Deep Learning in Computer Vision

Integrated Circuits and Systems; Solid State Electronics; Computer Engineering

At least four of the following courses:

1) ECE 511 – Advanced Digital Circuit and System Design
2) ECE 512 – Digital System Testing and Design
3) ECE 547 – Fundamentals of Solid-State Devices
4) ECE 551 – Design CMOS Analog Integer Circuit
5) ECE 553 – Digital Integrated Circuit Design
6) ECE 559 – Microfabrication & Nanofabrication Topics II
7) ECE 570 – Computational Electromagnetics
10) ECE 578 – Microwave and Millimeter-wave Circuits
11) ECE 644 B1 – Digital Image and Video Processing (only for Computer Engineering stream)
12) ECE 646 A1 – Organic Electronics
13) ECE 650 – Radio Frequency Integrated Circuits
14) ECE 710 B01 – Wearable Device, IoT, Data Analysis

15) ECE 720 A02 – Metaheuristic Optimization
16) ECE 750 B02 – Devices for Sensing Applications
17) ECE 750 B01 – Nanobiotechnological Systems

Energy Systems

At least four of the following courses:

1) ECE 511 – Advanced Digital Circuit and System Design
2) ECE 530 A1 – Power Qual/Dist Analysis
3) ECE 531 – Industrial Drives (Students who have taken ECE 432 are not allowed to take ECE 531)
4) ECE 560 – Modern Control Theory
5) ECE 561 – Nonlinear Control Systems
6) ECE 570 – Computational Electromagnetics
7) ECE 631 – High-Voltage DC (HVDC) Systems
8) ECE 633 – Modeling and Simulation of Electromagnetics Transient in Electrical Circuit
9) ECE 635 – Power Converter Renewable Energy System
10) ECE 636 – Voltage Source Converters
11) ECE 730 B01 – Smart Grid Fundamentals
12) ECE 730 B02 – Power Converter System Design

Control Systems

At least four of the following courses:

1) ECE 560 – Modern Control Theory
2) ECE 561 – Nonlinear Control Systems
3) ECE 660 – Optimization in Dynamic Control and Estimation
4) ECE 664 – Nonlinear Control Design with Application
5) ECE 665 – Multivariable Robust Control
6) ECE 740 A01 – Computer and Robot Vision
7) ECE 760 B01 – Robotics: Modeling, Learning and Control
8) CH E 662 – Process Identification
9) CH E 694 – 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 – Microwave and Millimeter-wave Circuits

Biomedical Engineering

1) ECE 644 B1 – Digital Image and Video Processing
2) ECE 691 – Biomedical Optics
3) ECE 692 – Ultrasound Imaging
4) ECE 710 B01 – Wearable Device, IoT, Data Analysis
5) ECE 740 A03 – Biomedical Image Analysis
6) ECE 740 B01 – Deep Learning in Computer Vision

Photonics & Plasmas; Microsystems & Nanodevices

1) ECE 558 – Microfabrication & Nanofabrication Topics I
2) ECE 559 – Microfabrication & Nanofabrication Topics II
3) ECE 571 – Optical & Quantum Electronics
4) ECE 572 – Nonlinear Optics

5) ECE 673 – Laser Applications
6) ECE 675 – Plasma Engineering
7) ECE 770 A01 – Laser-plasma Interactions
8) ECE 770 B01 – Nanoscale Optics
9) ECE 770 B02 – Optics for Microsystems
10) ECE 770 B03– Silicon Photonic Integrated Circuits
11) ECE 770 B04– Advanced Topics in Radio Wave Propagation