Rice University Department of Electrical and Computer Engineering - MECE Degree Plan

Academic Advisor:						
Name: (First, Last)	**Full or Part Time:**	**Student ID #:**	**Capstone Specialization Area**	**Course Specialization Area:**	**1st semester at Rice (fall/spr 202x):**	**Intended Final Term: (fall/spr 202x):**

What is your career objective that is guiding your course selection?

Requirement (credit hours)	Course (number & name)	Semester (fall/spr)	Year (202x)	Credit Hours	Grade
Foundations (3)					
Capstone (6)					
Communications (3)					
Software (6)					
Specialization (6)					
Elective (6)					
Seminar (required each semester in-residence at Rice University, credit hours earned do not apply towards degree requirements)					

Plan reviewed and approved by: _____ Date: _____

Once reviewed and signed by your academic advisor, submit the signed version to the Degree Plan assignment in Canvas for ELEC 698 no later than 2 days before the ADD deadline.

MECE Degree Requirements

The MECE degree plan includes a summary of the MECE student's career objectives along with a listing of coursework taken in previous semesters and proposed for future semesters aimed to further the student's career objectives.

Coursework listed on the MECE degree plan must satisfy the following requirements:

- It must include at least 30 credit hours comprised of 10 courses of at least 3 credit hours each
    - Courses must be at the 500-level or above
- 27 credit hours must be taken at Rice University
- 3 courses (9 credit hours) fulfilling the Capstone Requirement for your Capstone Specialization Area:
    - 1 course (3 credit hours) to fulfill the Capstone Foundations requirement
    - 2 courses (6 credit hours) to fulfill the Capstone Experience Project requirement
- 1 course (3 credit hours) fulfilling the Engineering Communications Requirement
- 2 courses (6 credit hours) fulfilling the Engineering Software Development Requirement
- 2 courses (6 credit hours) in your Course Specialization Area
- 2 courses (6 credit hours) fulfilling the Elective Requirements
- ELEC 698 each semester in residence at Rice University
- Note that your Capstone Specialization Area and Course Specialization Area can be different, but either must be selected from the following: Computer Engineering, Wireless Systems, AI & Systems, Computer Vision, Digital Health, Quantum Engineering, or Neuroengineering

The following course lists are suggestions for fulfilling each requirement.

Capstone Foundations Courses (must choose from this list)
ELEC 522 Advanced VLSI Design or ELEC 515 Efficient Machine Learning [Computer Engineering Capstone]
ELEC 551 Modern Communication Theory and Practice [Wireless Systems Capstone]
ELEC 578 Introduction to Machine Learning or COMP 540 Statistical Machine Learning [AI & Systems Capstone]
ELEC 576 Introduction to Deep Learning [Computer Vision Capstone, Digital Health Capstone]
ELEC 580 Quantum Mechanics and Real-World Applications [Quantum Engineering Capstone]
ELEC 587 Introduction to Neuroengineering [Neuroengineering Capstone]

Capstone Experience Course (required regardless of capstone area; must be taken twice)
ELEC 594 MECE Capstone Project

- ELEC 594 must be taken during both the second and third semesters of your degree unless an exception is provided by your academic advisor

Engineering Communications Courses (must choose from this list)
ENGI 501 Workplace Communication for Professional Master's Students in Engineering
RCEL 501 Engineering Mgmt and Leadership
RCEL 510 Technical and Managerial Communications
RCEL 542 Professional Communication for Engineering Leaders
ENGI 555 Engineering Persuasion: How to Drive Decisions and Change

Engineering Software Development Courses (suggestions, not an exhaustive list)
STAT 605 R for Data Science
STAT 606 SAS Statistical Programming
STAT 624 Modern AI Models
COMP 533 Introduction to Database Systems
COMP 534 Parallel Computing
COMP 539 Software Engineer Methodology
COMP 553 Big Data Management for Data Science
COMP 562 Intro to Modern Robotics
COMP 614 Computer Programming for Data Science
ELEC 512 Graduate Design and Analysis of Algorithms
ELEC 532 Neural Interface Engineering Laboratory
ELEC 546 Introduction to Computer Vision
ELEC 547 Introduction to Human-Machine Interfaces

ELEC 550 Algorithmic Robotics
ELEC 552 Operating Systems and Concurrent Programming
ELEC 555 Imaging and Vision for Robotics
ELEC 565 Solid State Materials & Device Applications [Particularly for quantum engineering]
ELEC 568 Introduction to Quantum Computing with Qiskit [Particularly for quantum engineering]
ELEC 581 Quantum Information Processing [Particularly for quantum engineering]
ELEC 584 Quantum Physics in Semiconductor Devices [Particularly for quantum engineering]

Recommendations for Course Specialization (suggestions, lists are not exhaustive)

Computer Engineering
ELEC 505 RISC-V System-on-Chip Design
ELEC 514 Wireless IC
ELEC 515 Efficient Machine Learning
ELEC 517 Microwave Engineering
ELEC 521 Advanced Digital Integrated Circuit Design
ELEC 522 Advanced VLSI Design
ELEC 523 Introduction to Microfabrication
ELEC 526 High Performance Computer Architecture
ELEC 527 VLSI Systems Design
ELEC 534 Hardware Verification
ELEC 537 Intelligent Mobile Systems
ELEC 543 Advanced High-Speed System Design
ELEC 553 Mobile and Embedded System Design and Application
ELEC 554 Computer Systems Architecture
ELEC 574 Ubiquitous and Wearable Computing

Computer Vision
ELEC 502 Neural Machine Learning I
ELEC 515 Efficient Machine Learning
ELEC 531 Statistical Signal Processing
ELEC 533 Introduction to Random Processes and Applications
ELEC 536 Joint Sensing & Communications
ELEC 537 Intelligent Mobile Systems
ELEC 542 Generative AI for Image Data
ELEC 546 Introduction to Computer Vision
ELEC 549 Computational Photography
ELEC 553 Mobile and Embedded System Design and Application
ELEC 555 Imaging and Vision for Robotics
ELEC 558 Digital Signal Processing
ELEC 559 Image and Video Compression
ELEC 575 Learning from Sensor Data
ELEC 576 A Practical Introduction to Deep Machine Learning
ELEC 578 Introduction to Machine Learning
ELEC 631 Advanced Machine Learning
STAT 624 Modern AI Models

AI & Systems
ELEC 502 Neural Machine Learning I
ELEC 506 Linear Algebra For Data Science
ELEC 512 Graduate Design and Analysis of Algorithms
ELEC 515 Efficient Machine Learning
ELEC 519 Data and Systems
ELEC 531 Statistical Signal Processing
ELEC 533 Introduction to Random Processes and Applications
ELEC 535 Information Theory
ELEC 537 Intelligent Mobile Systems
ELEC 546 Introduction to Computer Vision
ELEC 547 Introduction to Human-Machine Interfaces

ELEC 550 Algorithmic Robotics
ELEC 558 Digital Signal Processing
ELEC 559 Image and Video Compression
ELEC 575 Learning from Sensor Data
ELEC 576 A Practical Introduction to Deep Machine Learning
ELEC 577 Foundation Models for Biomedicine
ELEC 578 Introduction to Machine Learning
ELEC 631 Advanced Machine Learning
COMP 540 Statistical Machine Learning
STAT 624 Modern AI Models

Wireless Systems
ELEC 514 Wireless IC
ELEC 517 Microwave Engineering
ELEC 531 Statistical Signal Processing
ELEC 533 Introduction to Random Processes and Applications
ELEC 535 Information Theory
ELEC 536 Joint Sensing & Communications
ELEC 537 Intelligent Mobile Systems
ELEC 538 Advanced Wireless Networking
ELEC 539 Introduction to Communication Networks
ELEC 551 Modern Communication Theory and Practice
ELEC 558 Digital Signal Processing
ELEC 573 Network Science and Analytics

Neuroengineering
ELEC 502 Neural Machine Learning I
ELEC 523 Introduction to Microfabrication
ELEC 532 Neural Interface Engineering Laboratory
ELEC 533 Introduction to Random Processes and Applications
ELEC 547 Introduction to Human-Machine Interfaces
ELEC 548 Machine Learning and Signal Processing for Neuro Engineering
ELEC 582 Imaging Optics
ELEC 587 Introduction to Neuroengineering
ELEC 588 Theoretical Neuroscience I: Biophysical Modeling of Cells and Circuits
ELEC 589 Neural Computation
ELEC 680 Nano-Neurotechnology
ELEC 682 Spotlight on Latest Neurotechnology

Quantum Engineering
ELEC 517 Microwave Engineering
ELEC 523 Introduction to Microfabrication
ELEC 560 Physics of Sensor Materials and Nanosensor Technology
ELEC 561 Quantum Vacuum Engineering
ELEC 562 Optoelectronic Devices
ELEC 563 Introduction to Solid State Physics I
ELEC 565: Solid-State Materials and Device Applications
ELEC 566 Nanophotonics and Metamaterials
ELEC 567 Nano-Optics
ELEC 568 Quantum Computing with Qiskit
ELEC 569 Ultrafast Optical Phenomena
ELEC 571 Imaging at the Nanoscale
ELEC 572 Finite Element Method for Multiphysics Modeling
ELEC 581 Quantum Information Processing Systems
ELEC 584 Quantum Physics in Semiconductor Devices
ELEC 603 Topics in Nanophotonics
ELEC 605 Computational Electrodynamics and Nanophotonics
ELEC 660 Quantum Information Science and Technology

Digital Health

ELEC 533 Introduction to Random Processes and Applications
ELEC 537 Intelligent Mobile Systems
ELEC 540 Fundamentals of Biosensors in Medicine
ELEC 541 3D Vision: From Autonomous Cars to the Metaverse
ELEC 542 Generative AI for Image Data
ELEC 546 Introduction to Computer Vision
ELEC 547 Introduction to Human-Machine Interfaces
ELEC 558 Digital Signal Processing
ELEC 570 Distributed Methods for Optimization and Machine Learning
ELEC 575 Learning from Sensor Data
ELEC 576 A Practical Introduction to Deep Machine Learning
ELEC 577 Foundation Models for Biomedicine
ELEC 578 Introduction to Machine Learning
ELEC 582 Imaging Optics
STAT 624 Modern AI Models

Elective Courses

Free electives may be fulfilled by any 2 courses (6 credit hours) selected from the following:

- Departmental (ELEC) course offerings taught by ECE faculty, excluding ELEC 595 when taken for more than 1 credit hour
- ENGI 530 when taken for 1 credit hour (higher than 1 credit hour makes it ineligible)
- Research coursework, such as ELEC 590 or ELEC 591, when either is taken for at least 3 credit hours;
- Any of the following courses: COMP 532, ELEC 512, ELEC 520, ELEC 552, ELEC 556, ELEC 557, ENGI 510, ENGI 528, ENGI 529, RCEL 501, RCEL 615, or NSCI 511; or
- Any other course approved by the student's MECE academic advisor.