M.S. in Uncrewed and Autonomous Systems Engineering

The MS in Uncrewed & Autonomous Systems Engineering (MSUNSE) prepares students to enter the cross-disciplinary engineering field of uncrewed systems and automated systems for land, sea, or air. The 30-credit program, built on rigorous coursework, allows students the option of developing and demonstrating knowledge attainment through project-based experiences. The program's fifteen-credit core provides breadth across pertinent issues in uncrewed and autonomous systems: uncrewed platforms; planning and localization; sensors and data links; control systems; reliability, safety, and certification; and networking.

The program's remaining fifteen credits can follow one of two options.

- Under the Graduate Project option, students must complete two approved (technical electives), two open electives, and a one-term Graduate Project course.
- Under the Thesis Option, students must complete one approved elective, one open elective, a course on research methods, and six credits of Thesis.

Admissions Criteria

Students will:

- Apply fundamental engineering practices to analyze, design, and support the implementation and development of uncrewed and/or autonomous systems.
- Solve engineering problems in uncrewed/autonomous systems using knowledge gained on advanced topics covered from the program's core and chosen electives.
- Communicate issues pertaining to uncrewed and autonomous systems to peers.
- Implement safe systems through analysis and design techniques.

Program Requirements

The program supports the Thesis and Graduate Project options

Core Requirements		15
AE/EE/ME 527	Modern Control Systems	3
CEC 528	Networks	3
EE 528	Sensors and Data Links	3
ME 503	Introduction to Autonomous Vehicle Systems	3
SYS 505	System Safety and Certification	3
Thesis Option		
One (1) Approved Elective		3
One (1) Open Elective *		3
EGR 600	Research Methods for Engineers	3
UAS 700	Thesis	3
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Graduate Project Option		
Two (2) Approved Electives		6
Two (2) Open Electives *		6
UAS 690	Graduate Project	3
Total Credits		**30**

Approved Electives

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AE 506	Airplane Dynamic Stability	3
AE 553	Hybrid and Urban Air Mobility	3
AE 623	Navigation, Guidance and Control	3
AE 626	Advanced Topics in Discrete Control Theory	3
CEC 500	Engineering Project Management	3
CEC 526	Sensor Data Fusion	3
CEC 527	Mobile Sensor Networks	3
CEC 530	Image Processing and Machine Vision	3
CEC 610	State and Parameter Estimation	3
CS 528	Multi-Agent Systems	3
CS 529	Computer Security	3
CS 555	Artificial Intelligence	3
EE 500	Digital Control Systems	3
EE 505	Advanced Mechatronics	3
EE 510	Linear Systems	3
EE 515	Random Signals	3
EE 525	Avionics and Radio Navigation	3
EE 529	Electro-Optical Systems	3
EE 625	Satellite-Based Communications and Navigation	3
ME 513	Perception Methods for Autonomous Systems	3
ME 520	Sensor Processing with Applications	3
ME 523	Modeling and Simulation of Linear Dynamic Systems	3
ME 610	Automation and Additive Manufacturing	3
ME 615	Pattern Recognition and Machine Learning	3
SYS 500	Fundamentals of Systems Engineering	3
SYS 530	System Requirements Analysis and Modeling	3
SYS 560	Introduction to Systems Engineering Management	3
SYS 610	System Architecture Design and Modeling	3
SYS 625	System Quality Assurance	3

* Open electives are 500-level or higher courses relevant to uncrewed and/or autonomous systems. Students should see their advisor to determine the suitability of their open electives.