Post-Baccalaureate Certificate in Unmanned Vehicle Systems (Mechanical and Aerospace Engineering)

About This Program

Post-Baccalaureate Certificate in Unmanned Vehicle Systems (UVS) offered through the Mechanical and Aerospace Engineering Department will educate graduate students and train practicing engineers in selected areas required for the design, development and operation of UVS including Unmanned Aircraft Systems (UAS), Unmanned Ground Systems (UGS) and Unmanned Maritime Systems (UMS). The certificate program will emphasize the common aspects of UVS including sensors, actuators, communications and more importantly decision-making capabilities (autonomy), while also covering development of domain-specific mobile platforms such as airplane, rotorcraft, Ackerman steering car and boat. A student after completing this program will be familiar with the UVS-related concepts, theories and enabling technologies, and their interrelations while at the same time gaining a focused experience in specific areas of the student's choice. This program will also give students the opportunity to gain practical experience contributing to a larger system by working in a multidisciplinary environment. This program aims at the dual goal of providing the UVS industry with a knowledgeable, locally available workforce and developing career opportunities for its participants.

Competencies

1. Upon completion, the students will be able to apply "systems thinking" to design an autonomous vehicle to satisfy specific mission requirements.
2. Upon completion, the students will be able to integrate sensors, actuators, and software on a mobility platform.
3. Upon completion, the students will be able to select appropriate sensing, and control algorithms and deploy them on a mobility platform.

Admissions Criteria

1. A Bachelor's degree in an engineering discipline with a minimum GPA of 3.0 or a current enrollment in an engineering graduate program at UTA with a minimum GPA of 3.0.
2. An essay detailing the applicant's background and skills as pertaining to UVS, interest in a specific domain and expected benefit from completing this program.
3. Two recommendation letters explaining how the applicant will contribute to the certificate program and how the applicant will benefit by completing the program.

Those who desire to complete the certificate program without enrolling in graduate degree program must be admitted to UTA as a non-degree seeking student.

Curriculum

Foundations

AE 5378	INTRODUCTION TO UNMANNED VEHICLE SYSTEMS	3
or ME 5378	INTRODUCTION TO UNMANNED VEHICLE SYSTEMS	
AE 5379	UNMANNED VEHICLE SYSTEM DEVELOPMENT	3
or ME 5379	UNMANNED VEHICLE SYSTEM DEVELOPMENT	
Electives		
Select 9 hours from the following with at least 6 hours from AE and ME and up to 3 hours from the additional areas:		9
Aerospace Engineering (AE)		
AE 5301	ADVANCED TOPICS IN AEROSPACE ENGINEERING (with prior approval of advisor when topic is relevant)	
AE 5302	ADVANCED FLIGHT MECHANICS	
AE 5303	CLASSICAL METHODS OF CONTROL SYSTEMS ANALYSIS AND SYNTHESIS	
AE 5336	OPTIMAL ESTIMATION OF DYNAMIC SYSTEMS	
AE 5337	INTRODUCTION TO ROBOTICS	
AE 5341	CONTROL SYSTEM COMPONENTS	
AE 5362	GUIDANCE, NAVIGATION, AND CONTROL OF AEROSPACE VEHICLES	
AE 5368	FLIGHT VEHICLE SYNTHESIS AND SYSTEMS ENGINEERING	
AE 5374	NONLINEAR SYSTEMS ANALYSIS AND CONTROLS	
AE 5380	DESIGN OF DIGITAL CONTROL SYSTEMS	
Mechanical Engineering (ME)		

ME 5303	CLASSICAL METHODS OF CONTROL SYSTEMS ANALYSIS AND SYNTHESIS	
ME 5305	DYNAMIC SYSTEMS MODELING	
ME 5335	OPTIMAL CONTROL OF DYNAMIC SYSTEMS	
ME 5336	OPTIMAL ESTIMATION OF DYNAMIC SYSTEMS	
ME 5337	INTRODUCTION TO ROBOTICS	
ME 5341	CONTROL SYSTEM COMPONENTS	
ME 5374	NONLINEAR SYSTEMS ANALYSIS AND CONTROLS	
ME 5380	DESIGN OF DIGITAL CONTROL SYSTEMS	
ME 5390	SPECIAL TOPICS IN MECHANICAL ENGINEERING (with prior approval of advisor when topic is relevant)	
Electrical Engineering (EE)		
EE 5322	INTELLIGENT CONTROL SYSTEMS	
EE 5313	MICROPROCESSOR SYSTEMS	
EE 5314	EMBEDDED MICROCONTROLLER SYSTEMS	
Computer Science and Engineering (CSE)		
CSE 5326	REAL-TIME SOFTWARE DESIGN	
CSE 5360	ARTIFICIAL INTELLIGENCE I	
CSE 5361	ARTIFICIAL INTELLIGENCE II	
CSE 5364	ROBOTICS	
Industrial Engineering (IE)		
IE 5330	AUTOMATION AND ADVANCED MANUFACTURING	
IE 5339	PRODUCT DESIGN, DEVELOPMENT, PRODUCIBILITY, AND RELIABILITY DESIGN	
IE 5351	INTRODUCTION TO SYSTEMS ENGINEERING	
Engineering (ENGR)		
ENGR 5302	ENGINEERING ENTREPRENEURSHIP	
Total Hours		**15**

SUGGESTED COURSE SEQUENCE

The recommended progression in the program is (1) start with AE 5378 or ME 5378, which will raise awareness with UVS-related subjects in the following coursework, (2) take 9 credit hours of coursework and any prerequisite if applicable for the elective course selected, and (3) complete the certificate program with AE 5379 or ME 5379. Prerequisites to the elective courses will not be counted towards the 15 hour requirement.

Program Completion

Students must complete coursework with a 3.0 grade point average or better. A grade of C or better is required in all courses counted towards the completion of the certificate.

Advising Resources

Advising can be conducted in person or remotely via Teams. Please email your advisor to schedule an appointment. The advising form can be downloaded from the MAE Grad Advising Canvas page. First consult with your advisor if you are planning a Leave of Absence, Grade Forgiveness, or Change of Program.

Location:

306 Woolf Hall

Email:

MAEGradAdvising@uta.edu

Phone:

817-272-2500

Web:

Graduate Advising Webpage (https://www.uta.edu/academics/schools-colleges/engineering/academics/departments/mechanical-aerospace/students/gradadvising/)