



CONTROL SYSTEMS GRADUATE CERTIFICATE

The **CONTROL SYSTEMS CERTIFICATE** is designed to prepare for careers related to control systems technologies. Areas of emphasis include advanced control engineering concepts, state-space representation of dynamic systems, advanced analytical techniques, linear, optimal, and nonlinear control design methodologies, state and parameter estimation, as well as robust and adaptive control synthesis.

Who Should Participate?

Working professionals, military members, students at other universities worldwide, and current on-campus students who leave the Gainesville area to complete an internship, externship, or co-op (single or multiple terms) can participate in MAE Certificate Programs through the MAE EDGE distance learning platform.

All courses are offered through the online UF EDGE (Electronic Delivery of Gator Engineering) platform, which makes continuing your education possible no matter where you live or work! There are no campus visits required to earn this UF MAE graduate level certification, and the certificate conferred is identical to that earned as an on-campus graduate student.

What is the Admissions Process?

Distance Learning Professionals: Generally, for MAE certificate program admission, you need a bachelor's degree (BS) in engineering, science, technology, or a closely related discipline with a 3.0 undergraduate GPA, or you need a minimum of five years of professional employment experience in an engineering discipline (NOTE: a GRE exam score is not required for certificate program admission).

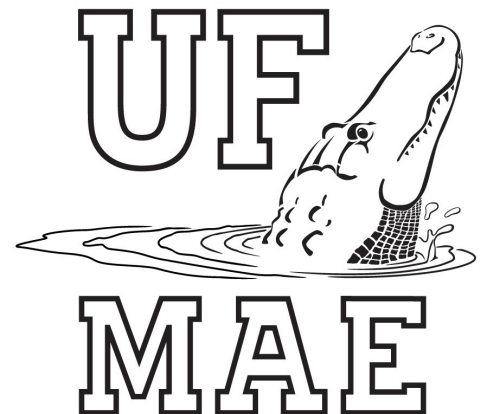
All applicants must apply online at the Office of Admissions: 1) complete the application <http://www.admissions.ufl.edu/apply/more#certificates>, 2) remit the \$30 application fee, 3) submit official transcripts from your prior BS degree institution, and 4) complete the residency information and verification process. Once your application has been reviewed by the Office of Admissions, your information will be referred to the MAE Student Services Office for an admission decision. *New students* should use the following link: <https://student.ufl.edu/cgi-bin/eaglec>.

UF On-Campus Graduate Students: Currently enrolled UF graduate students may apply for admission to any MAE EDGE graduate certificate program offered to our distance learning professionals. For admission eligibility, you need a 3.0 graduate GPA in engineering, science, technology, or a closely related discipline.

All applicants must apply online at the Office of Admissions: <http://admissions.ufl.edu/apply/more>. No application fee is assessed for currently enrolled, degree seeking students. Once the Office of Admissions has reviewed your application, your information will be referred to MAE Student Services for an admission decision.

You **SHOULD APPLY** for certificate programs as early as possible to ensure you gain admission into the program; you **MUST APPLY** for certificate programs no later than the Graduate School midpoint deadline in the term you wish to certify. See Individual Term Calendars (<http://gradcatalog.ufl.edu/content.php?catoid=11&navoid=2421>) to determine the midpoint deadline of your degree candidate term.

NOTE to UF On-Campus Graduate Students: Enrollment in certificate coursework may be on-campus or via the EDGE distance learning platform (for students participating in an internship, externship, or co-op.)



www.mae.ufl.edu

Certificate Structure

The **CONTROL SYSTEMS CERTIFICATE** consists of a total of 3 courses (9 credit hours). Lectures are available online in streaming and downloadable video, all semester, making it easy for students to review lectures before exams. Degree seeking and Certificate students view courses online, submit coursework online, and interact with professors using e-mail, telephone, and course websites via CANVAS. Students are never required to travel to campus, and course exams are proctored via internal employer supervisor, external testing agency, local 2-year or 4-year higher education institution, etc. For any questions about MAE Certificate Program or the UF EDGE distance learning platform, please contact the MAE Student Services Office: grad@mae.ufl.edu or 352-392-0962.

Curriculum Requirements—Students complete 3 of the following courses

EML5311 — Control System Theory

Analyzing dynamic mechanical engineering control systems. Introduction to classical, digital, and state space techniques. Modeling, stability, transient response, and frequency response. Considers implementation.

EML6229—Intro to Random Dynamical Systems

Analysis of stochastic systems found in science and engineering applications. Practical application of uncertainty analysis in nonlinear dynamical systems.

EML6350 — Introduction to Nonlinear Control

Introduction to nonlinear analysis and control systems theory. Lyapunov-based analysis and design techniques.

EML6351 — Nonlinear Control II: Adaptive Control

Control methods for uncertain nonlinear systems. Lyapunov-based robust, adaptive, learning, and estimation-based methods.

EML6352 — Optimal Estimation and Kalman Filtering

Methods of estimating parameters and random variables from noisy measurements with applications. State estimation of linear and non-linear dynamic systems with Kalman filtering and extended Kalman filtering, with mechanical and aerospace engineering applications such as target tracking.

EML6934—Optimal Control

Demonstrates that optimizing the performance of a dynamic system is a problem of great interest in many branches of engineering. In such systems it is desired to determine the particular input that optimizes the system performance subject to constraints on the motion. This course develops the mathematical framework for optimal control.

Completion Requirements

MAE Graduate certificate participants must 1) achieve certificate admission, 2) earn a grade of B or better in each course used to fulfill certificate requirements, and 3) file an application for certificate by the deadline with the Office of the University Registrar at ONE.UF during the final term of enrollment in a certificate course (<https://one.ufl.edu/dashboard/>). To file an application, select Certificate/Degree Application under My Record on the left menu.

Contact Information

For additional information, please contact the MAE Student Services Office:
EDGEStudentServices@mae.ufl.edu · 352-392-0962.

For information on course content and professional development outcomes, please contact: Warren Dixon, Professor, Department of Mechanical & Aerospace Engineering Email: wdixon@ufl.edu.

