COURSE CHANGE REQUEST
Undergraduate Programs

FLORIDA ATLANTIC UNIVERSITY

| Department | |
| College | |

UUPC Approval _4/21/2025_
UFS Approval _____
SCNS Submittal _____
Confirmed _____
Banner Posted _____
Catalog _____

Current Course Prefix and Number	*Current* Course Title

*Syllabus must be attached for **ANY** changes to current course details. See Template. Please consult and list departments that may be affected by the changes; attach documentation.*

Change title to:

Change prefix

        From: To:

Change course number

        From: To:

Change credits*

        From: To:

Change grading

        From: To:

Change WAC/Gordon Rule status**

        Add   Remove

Change General Education Requirements***

        Add   Remove

  *See Definition of a Credit Hour.
 **WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to this form. See WAC Guidelines.
***GE criteria must be indicated in syllabus and approval attached to this form. See Intellectual Foundations Guidelines.

Change description to:

Change prerequisites/minimum grades to:

Change corequisites to:

Change registration controls to:

Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade (default is D-).

Effective Term/Year for Changes:	**Terminate course? Effective Term/Year for Termination:**

Faculty Contact/Email/Phone

Approved by		*Date*
Department Chair	_Hai Kava_	3/12/2025
College Curriculum Chair	_Yalan Liu_	4/10/25
College Dean		4/11/25
UUPC Chair	_Korey Sorge_	4/21/2025
Undergraduate Studies Dean	_Dan Meeroff_	4/21/2025
UFS President		
Provost		

Email this form and syllabus to mjenning@fau.edu seven business days before the UUPC meeting.

FLORIDA ATLANTIC UNIVERSITY

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EEL 4652C-001 14403

Control Systems 1
Date: Wednesday, Friday 12:30 PM - 1:50 PM
Building: Fleming Hall Boca **Room:** 426
3 Credit(s)
Spring 2025 - 1 Full Term

Instructor Information

Zvi Roth
Email: rothz@fau.edu

Dolores De Groff
Email: degroff@fau.edu
Office: EE440
Office Hours: W,F: 2 - 3:30 pm
Phone: 561-297-1261

Email: degroff@fau.edu

TA Name: Hassan Mokari
Office: EE 209
Office Hours: Mondays 3pm- 7 pm
Telephone:
Email: hmokari2022@fau.edu

Control Lab meets Mondays 10 am - 11:50 am in EE 203 (optional)

Course Description

Control Systems 1
Prerequisites: EEL 3502 and (MAP 3305 or MAP 2302) with minimum grades of "C"
Theory and hands-on practice of classical control: stability, transient and steady-state performance,

controller design techniques, simulations and computer-aided system design; lab experiments of digital control using microcontrollers.

This course introduces students to basic concepts in feedback control systems, analysis, and design. Participants learn the meaning of feedback control, modeling, transient and steady state, analysis methods such as root locus and Nyquist, stability and margins, frequency response, and design of control systems.

There is also a lab component to the course. Students will gain hands-on practice of classical control, controller design techniques, simulations, and computer-aided system design. There are lab experiments of digital control using microcontrollers.

Prerequisites/Corequisites

Prerequisite(s):

- EEL 3502 Graduate / Undergraduate (Minimum Grade of C) AND
- MAP 3305 or MAP 2302 Graduate / Undergraduate

  (Minimum Grade of C)

Instructional Method

In-Person
Traditional concept of in person. Mandatory attendance is at the discretion of the instructor.

Required Texts/Materials

Modern Control Systems
ISBN: 9780134407623
Publisher: Pearson
Edition: 13th

Modern Control Systems (Subscription)
ISBN: 9780137207770
Publisher: Pearson Lifetime eBooks
Edition: 13th

Course Objectives/Student Learning Outcomes

Students will be able to:

Analyze Using block diagrams and Signal Flow Graphs

Understand Transient and Steady State Concepts

Analyze Using Root Locus Methods

Understand multi-approaches to stability and margins

Use Frequency response

Design Control Systems

Set up Projects using LabVIEW and Simulink

Use MATLAB for Control Applications

Use Arduino microcontroller to implement Proportional Control System, Integral Control, Stepper Speed Control, and PID Control

Faculty Rights and Responsibilities

Florida Atlantic University respects the rights of instructors to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede their exercise. To ensure these rights, faculty members have the prerogative to:

• Establish and implement academic standards.

• Establish and enforce reasonable behavior standards in each class.

• Recommend disciplinary action for students whose behavior may be judged as disruptive under the Student Code of Conduct University Regulation 4.007.

Disability Policy

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

Course Evaluation Method

Lab Activities: 30 %

3 Tests: 50 %

Test #1 Friday, Jan. 31

Test #2 Friday, Feb. 28

Test #3 Friday, April 4

Final Exam: 20 %

Friday, April 25, 10:30 am - 1 pm

Code of Academic Integrity

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001.

Attendance Policy Statement

Students are expected to attend all their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations, or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances, and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

Religious Accommodation Policy Statement

In accordance with the rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices and beliefs regarding admissions, registration, class attendance, and the scheduling of examinations and work assignments. University Regulation 2.007, Religious Observances, sets forth this policy for FAU and may be accessed on the FAU website at www.fau.edu/regulations.

Any student who feels aggrieved regarding religious accommodations may present a grievance to the executive director of The Office of Civil Rights and Title IX. Any such grievances will follow Florida Atlantic University's established grievance procedure regarding alleged discrimination.

Time Commitment Per Credit Hour

For traditionally delivered courses, not less than one (1) hour of classroom or direct faculty instruction each week for fifteen (15) weeks per Fall or Spring semester, and a minimum of two (2) hours of out-of-class student work for each credit hour. Equivalent time and effort are required for Summer Semesters, which usually have a shortened timeframe. Fully Online courses, hybrid, shortened, intensive format courses, and other non-traditional modes of delivery will demonstrate equivalent time and effort.

Course Grading Scale

Letter Grade	Letter Grade
A	90 - 100%
A-	88 - 89%
B+	86 - 87%
B	80 - 85%
B-	78 - 79%
C+	76 - 77%
C	70 - 75%
C-	68 - 69%
D+	66 - 67%
D	60 - 65%
D-	58 - 59%
F	Below 58

Grade Appeal Process

You may request a review of the final course grade when you believe that one of the following conditions apply:

• There was a computational or recording error in the grading.

• The grading process used non-academic criteria.

• There was a gross violation of the instructor's own grading system.

[University Regulation 4.002](#) of the University Regulations contains information on the grade appeals process

Policy on Make-up Tests, Late work, and Incompletes

Makeup tests are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam. Makeup exam should be administered and proctored by department personnel unless there are other pre-approved arrangements.

Late work is not acceptable.

Incomplete grades are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency, incomplete grades will not be given.

Special Course Requirements

LabVIEW, MATLAB, SIMULINK, and Arduino can be accessed through VMware. Lab kits will be distributed.

Policy on the Recording of Lectures

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited. Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these

requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

Artificial Intelligence Preamble

FAU recognizes the value of generative AI in facilitating learning. However, output generated by artificial intelligence (AI), such as written words, computations, code, artwork, images, music, etc., for example, is drawn from previously published materials and is not your own original work.

FAU students are not permitted to use AI for any course work unless explicitly allowed to do so by the instructor of the class for a specific assignment. **[Policy 12.16 Artificial Intelligence]**

Class policies related to AI use are decided by the individual faculty. Some faculty may permit the use of AI in some assignments but not others, and some faculty may prohibit the use of AI in their course entirely. In the case that an instructor permits the use of AI for some assignments, the assignment instructions will indicate when and how the use of AI is permitted in that specific assignment. It is the student's responsibility to comply with the instructor's expectations for each assignment in each course. When AI is authorized, the student is also responsible and accountable for the content of the work. AI may generate inaccurate, false, or exaggerated information. Users should approach any generated content with skepticism and review any information generated by AI before using generated content as-is.

If you are unclear about whether or not the use of AI is permitted, ask your instructor before starting the assignment.

Failure to comply with the requirements related to the use of AI may constitute a violation of the **Florida Atlantic Code of Academic Integrity, Regulation 4.001.**

Proper Citation: If the use of AI is permitted for a specific assignment, then use of the AI tool must be properly documented and cited. For more information on how to properly cite the use of AI tools, visit **https://fau.edu/ai/citation**

Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual therapy, group therapy, and crisis services, to name a few - offered to help improve and maintain emotional well-being. For more information, go to http://www.fau.edu/counseling/

Student Support Services and Online Resources

- [Center for Learning and Student Success (CLASS)](#)

- [Counseling and Psychological Services (CAPS)](#)

- [FAU Libraries](#)

- [Math Learning Center](#)

- [Office of Information Technology Helpdesk](#)

- [Center for Global Engagement](#)

- [Office of Undergraduate Research and Inquiry (OURI)](#)

- [Science Learning Center](#)

- [Speaking Center](#)

- [Student Accessibility Services](#)

- [Student Athlete Success Center (SASC)](#)

- [Testing and Certification](#)

- [Test Preparation](#)

- [University Academic Advising Services](#)

- [University Center for Excellence in Writing (UCEW)](#)

- [Writing Across the Curriculum (WAC)](#)

Course Topical Outline

Date	Lecture	Experiment/Lab
Week 1 Jan. 6 - 10	Module 1 Introduction, why feedback? The Laplace Transform The Transfer Function Block Diagram Models	Module 10 General Introduction to lab, syllabus, and grading policy Start Experiment 1 LabVIEW: Basics
Week 2 Jan. 13 - 17	Module 1 continued Block Diagram, DC Motors Start Module 2 Signal Flow Graph Models	Experiment 1 LabView: Basics Completed

Week 3 Jan. 20 - 24	Complete Module 2 Signal Flow Graph Completed Begin Module 3 Time Domain Analysis of Control Systems	Monday, Jan. 20 Holiday Martin Luther King Jr. No in-person Control Lab
Week 4 Jan. 27 - 31	Complete Module 3 Test #1 Friday, January 31 (covers Modules 1 and 2)	Experiment 2 LabView: Functions Completed Exp 1&2 LabVIEW Problems Completed Module 10 LabVIEW Completed
Week 5 Feb. 3 - 7	Begin Module 4 Stability	Project 1 Completed Module 11 Matlab Tutorial Matlab Part 2
Week 6 Feb. 10 - 14	Complete Module 4 Stability Begin Module 5 Steady State Performance of Feedback Control Systems	Simulink Intro Completed Experiment 3: Modeling of Physical Systems Using Simulink Completed
Week 7 Feb. 17 - 21	Complete Module 5 Steady State Performance of Feedback Control Systems	Module 12 MATLAB for Control completed Experiment 4: Linear Time-invariant Systems and Representation Completed
Week 8 Feb. 24 - 28	Begin Module 6 Root Locus Test #2 Friday, Feb. 28 (covers Modules 3,4,and 5)	Module 13 Arduino Tutorial Experiment 5: Introduction to Arduino and Control system using Arduino
Week 9 March 3 - 7	Spring Break	Spring Break

Week 10	Root Locus	Module 14
March 10 - 14		Experiment 6: Implementing a Proportional Control System using MATLAB and Arduino Nano.
Week 11	Root Locus	Module 15
March 17 - 21		Experiment 7: Implementing a Proportional Integral Control System using MATLAB/Arduino and Stepper Speed Control using Arduino
Week 12	Root Locus Completed	Module 16
March 24 - 28	Begin Module 7 Frequency Response and Bode plots	Experiment 8: PID Control System using Arduino nano
Week 13 March 31 - April 4	Frequency Response and Bode plots Completed Begin Module 8 Nyquist Criterion Test #3 Friday, April 4 (covers Modules 6 and 7)	Module 17 Proposal of Project 2
Week 14 April 7 - 11	Nyquist Criterion Completed Begin Module 9 Gain Margin, Phase Margin, Design of Control Systems, Design in the Frequency Domain	Work on Project 2 Complete Test #3 using MATLAB.
Week 15 April 14 - 18	Gain Margin, Phase Margin, Design of Control Systems, Design in the Frequency Domain	Continue working on Project 2
Week 16 Monday, April 21	No in-person Lectures	Project 2 Completed and Demonstrated Control Lab meets Monday 10 am in EE 203.

Final Exam: Friday, April 25, 10:30 am - 1:00 pm

Title IX Statement

In any case involving allegations of sexual misconduct, you are encouraged to report the matter to the University Title IX Coordinator in the Office of Civil Rights and Title IX (OCR9). If University faculty become aware of an allegation of sexual misconduct, they are expected to report it to OCR9. If a report is made, someone from OCR9 and/or Campus Victim Services will contact you to make you aware of available resources including support services, supportive measures, and the University's grievance procedures. More information, including contact information for OCR9, is available at **https://www.fau.edu/ocr9/title-ix/**. You may also contact Victim Services at **victimservices@fau.edu** or 561-297-0500 (ask to speak to an Advocate) or schedule an appointment with a counselor at Counseling and Psychological Services (CAPS) by calling 561-297-CAPS.