

Course Syllabus

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EEL 5182 Official Syllabus

EEL 5182, State Variable Methods in Linear Systems

Credits and Contact Hours: 3 crs; 3 classes per week of 50 minutes each

Textbook T. Kailath, "Linear systems", Prentice-Hall, NJ, 1980

a. **Supplemental Material:** none

Specific Course Information

- **Catalog Description:** Linear algebra and state variable methods for design and analysis of discrete and continuous linear systems.
- **Prerequisites:** EEL 4657.
- **Required, Elective, or Selected Elective:** Elective

Specific Goals for the Course

- **Specific Outcomes of Instruction:** A course on the use of state variable methods in the design of linear control systems.
- **Brief List of Topics to Be Covered**
 - Realization theory and implementation (5 weeks).
 - Controllability of linear systems.
 - State feedback and stabilization of linear systems
 - Linear observers.
 - Observability of linear systems.
 - Combining observers and controllers.
 - Stabilizability and detectability of linear systems.

1. Instructor: Dr. Jacob Hammer
 1. Office location: NEB 563
 2. Telephone: 392-4934
 3. E-mail address: hammer@mst.ufl.edu
 4. Web site: Canvas
 5. Office hours: MWF 3:50-4:40PM
2. Teaching Assistant Juntao Yao
 1. Office location NEB 222
 2. Telephone

3. E-mail address juntaoyao@ufl.edu
4. Office hours TBA
3. Meeting Times M W F 8
4. Meeting Location BEN 328
5. Grading – methods of evaluation: Homework 10%; midterm exam 35%; final exam 55%.
6. Grading Scale: The grade scale for this course is A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F. More information about the grading scale can be found at <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html> (Links to an external site.)Links to an external site.
7. "A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html> (Links to an external site.)Links to an external site."
8. Make-up Exam Policy: Approval required from UF counselor or physician.
9. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.
10. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

UF Counseling Services –Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
 - Career Resource Center, Reitz Union, 392-1601, career and job search services.
11. Software Use – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

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EEL 4610 Official Syllabus

No unread replies.No replies.

Title of Course: State Variable Methods in Linear Systems

EEL 4610

Class Periods: MWF, period 8, 3:00-3:50PM

Location: BEN 328

Academic Term: Spring 2019

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Instructor

- Name: Dr. Jacob Hammer
- Email Address: hammer@mst.ufl.edu
- Office Phone Number: 352-392-4934
- Office Hours: MWF 3:50-4:40PM in NEB 563

Teaching Assistants

Please contact through the Canvas website

Juntao Yao

Course Description

Linear algebra and state variable methods for design and analysis of discrete and continuous linear systems.

Course Pre-Requisites / Co-Requisites

Linear Control Systems EEL 4657

Course Objectives

To teach engineering students the use of state variable methods in the design and analysis of linear control systems.

These objectives will be accomplished through instruction in the following topics

- Realization theory and implementation (5 weeks).
- Controllability of linear systems.
- State feedback and stabilization of linear systems
- Linear observers.
- Observability of linear systems.
- Combining observers and controllers.
- Stabilizability and detectability of linear systems.

Materials and Supply Fees

N/A

Professional Component (ABET)

This course consists of 1.5 credits of Engineering Design and 1.5 credits of Engineering Science

Relation to Program Outcomes (ABET)

a - an ability to apply knowledge of mathematics, science, and engineering

c - an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

d - an ability to function on multi-disciplinary teams

e - an ability to identify, formulate, and solve engineering problems

i - a recognition of the need for, and an ability to engage in life-long learning

j - a knowledge of contemporary issues

k - an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

EE Program Criteria

EE2 - knowledge of mathematics, basic and engineering sciences necessary to analyze and design complex systems

EE3 - knowledge of advanced mathematics including linear algebra, complex variables and discrete mathematics

Required Textbooks and Software

- Title: Linear Systems
- Author: T. Kailath
- 1980, First Edition, Prentice-Hall, Inc.
- ISBN number: 0135369614
- Software: N/A

Recommended Materials

- Title: N/A
- Author:
- Publication date, edition, and publisher:
- ISBN number:

Course Schedule

Week 1:	Introduction
Week 2:	Background
Week 3:	Realization of Linear Systems
Week 4:	Observability
Week 5:	Reachability
Week 6:	Constructibility
Week 7:	Controllability
Week 8:	Discrete-time systems
Week 9:	Linear State Feedback
Week 10-11:	Asymptotic Observers
Week 12-13:	The Observer-Controller Configuration
Week 14:	Review

Attendance Policy, Class Expectations, and Make-Up Policy

Regular attendance is recommended, but no attendance will be taken.

Students must coordinate with instructor before missing an exam.

Makeups will be offered for excused absences and missed homework.

Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> ([Links to an external site.](#))[Links to an external site.](#)) and require appropriate documentation.

Students must possess portable computers and bring them to class upon announcement.

Evaluation of Grades:

Include the methods by which students will be evaluated and their grade determined.

Assignment	Percentage of Final Grade
Homework Sets (10)	10%
Quizzes (4)	N/A
Midterm Exam	35%
Final Exam	55%
Review Paper	N/A
Presentation	N/A
TOTAL	100%

Grading Policy:

NOTE: This grading scale is only an example and should not dictate the scale or weights chosen for a course

Percent	Grade	Grade Points
93 - 100	A	4.00
90 - 92	A-	3.67
87 - 89	B+	3.33
83 - 86	B	3.00
80 - 82	B-	2.67
77 - 79	C+	2.33
73 - 76	C	2.00
70 - 72	C-	1.67
67 - 69	D+	1.33
63 - 66	D	1.00
60 - 62	D-	0.67
0 - 59	E	0.00

A "C-" will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: A "C-" average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement.

Note: This course is co-listed with the graduate class EEL 5182. The homework portion of the graduate section will involve additional work and more advanced concepts with respect to the

undergraduate section. The exams will also involve more advanced concepts with respect to the undergraduate section.

More information on UF grading policy may be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx> (Links to an external site.)Links to an external site.

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals> (Links to an external site.)Links to an external site.. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/> (Links to an external site.)Links to an external site..

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.