Syllabus
MEEG 624 – Control of Dynamical Systems
MEEG 467 – Modern Control Systems

Lecture:

TuTh 12:30–1:45, Brown Lab Room 205

Instructor: Bert Tanner

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Office Hours:	TuThu 1:45-2:45

Prerequisites Information: No undergraduate prerequisites are applicable to the graduate class. Good working knowledge of the material of MATH 351 would be needed by undergraduates, and MEEG211, MEEG311 and MATH352 are required for registration.

Text: *Modern Control Systems*, W. Brogan, Third Edition, Prentice-Hall.

Description: This is a course on linear dynamical systems,mainly from a state space approach. The focus is on the mathematical structure and properties of linear systems, building up to methods for control design via pole placement. The graduate section will also venture into basic optimal control design. The first part of the course will be devoted to a review of the mathematical tools required, primarily from linear algebra: similarity transformations, diagonalization, linear independence, basis, and vector spaces. The emphasis is on analysis rather than computation.

Material to be Covered: Derivation and solution of linear state space equations, system transformations, controllability, observability, Lyapunov stability, pole placement, optimal control.

Evaluation methods: Homework are assigned on a weekly schedule. They will be due on a specific day when we meet and are supposed to be submitted at *before* the lecture

begins. Late homework is accepted at the expense of a 20% penalty for each additional day. Homework problems are selected from the textbook for the most part, with the intention to put in practice the material presented during the lecture. There will be a midterm exam scheduled close to (shortly before of after) the spring break. The final exam is scheduled at the time and date specified by the University. No modifications on the time or date of the final exam can be made. Some homework assignments may have portions tailored to undergraduate or graduate students specifically, and so will the exams.

Grade distribution:

Homework	20%
Project	40%
Final Exam	40%
Total	100%

A	96–100	A-	92–95	B+	88–91	B	84–87
B-	80–83	C+	76–79	C	72–75	C-	68–71
D+	64–67	D	60–63	D-	56–59	F	0–55

Final Exam: May 20, 1:00-3:00 pm (in class). Open book, open notes. No computation tools allowed other than a hand-held calculator. Bring own paper.

Working Together: Collaboration is accepted on homework, but solutions should be given based on individual justification and reasoning, which needs to be clear on your paper. Collaboration on exams is of course is forbidden.

Absences: You are expected to attend every class. It is not acceptable to give priority to assignment completion over class attendance. The 20% penalty on assignments thus applies also to the case where you choose to miss class in order to finish your assignment.

Plagiarism: The University's *minimum penalty* for cheating or plagiarism is *a failure in the course.*

Further reading:

- Panos J. Antsaklis and Anthony Michel, A Linear Systems Primer , McGraw-Hill
- Panos J. Antsaklis and Anthony Michel, Linear Systems, McGraw-Hill.
- J. Bay, Fundamentals of Linear State Space Systems, Mc Gray Hill

- Rugh, Linear System Theory, 2nd edition, Prentice Hall
- F.M. Callier, C.A. Desoer, Linear Systems Theory, Springer Verlag
- J. Dwight Aplevich, The essentials of Linear State-Space Systems, Wiley, 2000.