ME 364L/397: Automatic Control System Design
Fall 2019, Unique No. 18065/18316

Instructor:	Prof. Raul G. Longoria
Contact info:	`r.longoria@mail.utexas.edu`, (512) 471-0530
Office/hours:	ETC II 5.134B, TTH 3:30-4:30 pm

1. Course aims / objectives: This course provides an introduction to analysis of linear, controlled engineering systems, particularly aimed toward students in mechanical engineering. Feedback principles are reviewed, including concepts in stability analysis. Classical Routh, Nyquist, Bode, and root locus methods are emphasized. Some practical discussion is given to control components, industrial compensators, and effective controller design and implementation. Use of computer-based analysis will also be emphasized (using Matlab).

2. Prerequisites: It is expected that you have familiarity with topics covered in ME 344 or equivalent. ME 344 is a listed pre-requisite for this course.

3. Format and procedures: This course is delivered using lecture-based presentation. Exercises and case studies will be completed in the form of homework assignments. Class discussion and in-class examples will be emphasized.

4. Course Schedule: This syllabus conveys current plans and objectives. Adjustments may be made based on how the class is progressing. *Always* refer to the *course log* on Canvas. See Table 1 for tentative list of topics and assignments.

Table 1: Tentative schedule of topics and assignments

Week(s)	Topic	HW, Quiz
1-2	Intro, definitions, modeling review	HW 1
3	Solving systems (time, frequency)	HW 2
4	Intro to feedback control	
5	Stability, control actions	HW 3
6	Error analysis, transient optimization	HW 4, Q1
7	Root locus design	
8	Frequency response	HW 5
9-10	Frequency domain analysis/design	HW 6
11	Compensation methods	HW 7
12-13	Digital implementation	HW 8, Q2
14-16	Review and case studies	–
17	Final exam, Dec. 12, 2-5 pm	–

6. Course Requirements and Policies:

Course progress and participation policy:

(a) **Progress**: Attending class weekly and completing homework assignments is essential to progress in the course.

(b) **Participation**: A participation grade will be assigned based on your conduct and effectiveness to get things done in the lab.

(c) **Behavior**: You are expected to show respect and civility in all discourse with the TA, fellow students, administrators, and the course instructor.

Course Readings/Materials:

(a) **Textbook**: Handouts and slides will be provided on the course Canvas site. Excerpts from relevant textbooks will also be provided.

(b) **Supplemental references**: A textbook on system dynamics such as used in ME 344 can be useful. There are many textbooks on introductory control such as: 1) Ogata, Modern Control Engineering, Prentice-Hall; 2) Franklin, Powell, and Emami-Naeini, Feedback Control of Dynamic Systems, Peason Publishing. Additional references will be listed on Canvas site.

Assignments, Assessment, and Evaluation:
(a) **Assignments and Submissions**: All assignments are assigned on Canvas with specified due dates and submission requirements. Unless otherwise indicated, these should be submitted as PDF documents via Canvas.
(e) **Preparation and submission of assignments**: All submitted work should be professionally prepared and organized. If hand-written, writing must be neat and legible. Any submission that is not legible or reasonably organized will not be graded. Late penalties may apply.
(g) **Late policy**: Late submissions will be dealt with on a case by case basis, and there may be penalties applied to late submissions.
(h) **Make-ups**: Any make-ups on HW or Quizzes will be handled on a case by case basis, however there should be *prior* notice given for consideration.
(j) **Quizzes**: Dates for any quizzes will be posted on the course log on Canvas.
(k) **Final exam**: There is a final exam during the period scheduled by the University.

7. Grading Policy: Homework: 30%, 2 Quizzes: 40%, Final exam: 30%
8. Course Outcomes: This course addresses the following ABET program outcomes: 1, 6, 7. In particular, attention by the student should be given to Outcome 4, "Ability to set up and conduct experiments, and to present the results in a professional manner."
9. Academic Integrity: University of Texas Honor Code - The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.
Each student in this course is expected to abide by the University of Texas Honor Code. Any work submitted by a student in this course for academic credit will be the student's own work. For this course, collaboration is allowed when specified in the assignment.

10. Other University Notices and Policies: Be familiar with the University's official e-mail student notification policy. It is your responsibility to keep the University informed of changes in e-mail address. Students are expected to check Canvas and e-mail on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. (see http://www.utexas.edu/its/help/utmail/1564).
Documented Disability Statement. The University of Texas at Austin provides upon request appropriate academic adjustments for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4241 TDD. Notify the course instructor or TA as quickly as possible if the material being presented in class is not accessible (e.g., instructional videos need captioning, course slides are not readable, etc.).
Behavior Concerns Advice Line (BCAL). If you are worried about someone's behavior, use the Behavior Concerns Advice Line to discuss your concerns. This service is provided through a partnership among the Office of the Dean of Students, the Counseling and Mental Health Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232-5050 or visit http://www.utexas.edu/safety/bcal.
Religious Holy Days: University policy requires students to notify their instructors as far in advance of the absence as possible so that arrangements can be made. You will be given an opportunity to complete missed work within a reasonable time after the absence.
Drop Policy. Contact the ME department Undergraduate Office about drop policy.