UTTyler ENGINEERING

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MENG 4312 – System Dynamics and Control
Course Syllabus

Semester / Year	Fall 2026
Catalog Description	Dynamics of mechanical, electrical, thermal, fluid, and hybrid systems. System response using Laplace transform. Transfer functions. Transient response, Stability, Basic control algorithms, PID tuning methods, Frequency response, basic controller design and case studies.
Prerequisites	MENG 3309, MENG 3211, and MENG 3316, EENG 3301, EENG 3308
Section Number	001
Instructor Name	Dr. Chung Hyun Goh
Contact Information	Email: cgoh@uttyler.edu Phone: 903-566-6125 Office: RBN 3007
Class Type / Instruction Mode / Location	Face-to-face / Lecture / RBN 2007
Class Time	Tu/Th 11:00 AM – 12:20 PM
Office Hours	M 10:00 am – 11:00 am and Tu/Th 9:30 am – 10:30 am or by appointment
No. of Credits	3 credits (Lecture)
Required Textbook	System Dynamics – Katsuhiko Ogata 4th Ed., Prentice Hall, 2003, but older editions are acceptable.
Optional References	Recommended online textbook (available *via* library using patriots account) - Mandal, Ajit K.. *Introduction to Control Engineering: Modeling, Analysis and Design*, New Age International Ltd, 2006. *ProQuest Ebook Central*, https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=395560 - Lobontiu, Nicolae. *System dynamics for engineering students: Concepts and applications*. Academic Press, 2017. (Elsevier website: https://www.sciencedirect.com/book/9780128045596/system-dynamics-for-engineering-students)
Additional Rules and Requirements	• Assignments and tutorials on MATLAB and Simulink by Mathworks, Inc. (available through virtual desktop – one.uttyler.edu). • Since the mechanical engineering program is designed to prepare students for professional practice, all submitted work (e.g., homework, lab reports, projects, presentations) is expected to meet professional standards. Work that does not reflect professional quality may be subject to grade reductions, even if professionalism is not explicitly listed in the grading rubric. • Students can use AI programs (ChatGPT, Copilot, etc.) in this course. If you utilize an AI tool to help create content for an assignment, you must acknowledge and cite the tool's contribution to your work.

Evaluation Method	Project / Report 20%, Mid-Term Exam 20% Final Exam 20% Homework / Quizzes 20% Team-Based Modeling & Control Challenges (MATLAB/Simulink) 10% Course Participation 10% (In-class example, etc.)
Grading Policy / Scale	Letter grades, scale: A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60
Important Events / Dates	Census Date: 09/08/2026 Drop for non-payment: 09/16/2026 Last day to withdraw from one or more 15-week courses: 10/30/2026 Thanksgiving holidays (faculty and students): 11/23-11/27/2026 Final Exam: Tuesday, 12/08/2026, 11:00 AM-1:00 PM End of 15-week session: 12/12/2026 Academic Calendar: https://www.uttyler.edu/academics/academic-calendar-26-27/
Attendance / Makeup policy / other rules	Regular attendance is imperative if you want to do well in this course. Therefore, regular attendance is highly recommended. In case you have to miss a class, it is your responsibility to keep up with the class work and be informed of all announcements made in the class on HomeWorks, tests etc. No makeup exams will be authorized without providing an official document showing that your absence is in line with university rules.
Course Learning Objectives / ABET & PEOs Relation	By the end of this course, students will be able to: 1. Apply fundamental principles of dynamic systems to modeling. 2. Analyze dynamics systems in time domain and frequency domain. 3. Conduct the analysis and design of SISO control systems. 4. Use computational tools to assist in the design and analysis of dynamics systems and pertinent controllers. 5. Apply control system knowledge to real-world problems in case studies.
Tentative Topics / Course Plans	1. Laplace transform and dynamic-system modeling 2. Mechanical, electrical, fluid, and thermal system models 3. Transfer-function and state-space modeling approaches 4. Time-domain response, stability, and transient analysis 5. Frequency-domain analysis 6. Time-domain and frequency-domain control design, including PID concepts 7. MATLAB/Simulink modeling, simulation, and controller evaluation
University Policies	https://www.uttyler.edu/offices/academic-affairs/faculty-resources/syllabus-information/

Note:
The instructors reserve the right to modify the syllabus at any time during the semester to accommodate unforeseen circumstances, enhance the learning experience, or ensure the course objectives are met. Any changes will be communicated promptly to all students.