

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	030
Instructor Name	Dr. Hussain Rizvi
Contact Information	Email: hrizvi@uttyler.edu Office: HEC A206
Class Type / Instruction Mode / Location	Face-to-face 030: HEC C204
Class Time	030: TuTh 11:00 AM –12:20PM
Office Hours	MF 9:00 am -10:30 am, or by appointment outside of the regular office hours.
No. of Credits	3 credits
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-engineeringstudents)
Additional Rules and Requirements	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	Exam 30% Assignments, Class Participation and Conduct 30% Project 40%
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: 09/08/26 (Tu) Last date to withdraw from one or more courses: 10/30/26 Final Project Report: 12/04/26 Final date: 12/08/26 (T) Time: 11:00 am – 1:00 pm Academic Calendar: https://www.uttlyer.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. Transfer-function modeling approach 2. State-space modeling approach 3. Time domain analysis of dynamic systems 4. Frequency domain analysis of dynamics systems 5. Time domain control design 6. Frequency domain control design
University Policies	https://www.uttlyer.edu/offices/academic-affairs/faculty-resources/syllabus-information/