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MENG 4312 – System Dynamics and Control
Course Syllabus

Semester / Year	Fall 2024
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 4034
Class Time	Tu/Th 11:00 AM – 12:20 PM
Office Hours	Tu 9:00 am – 10:30 am / W 3:00 pm – 4:30 pm 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: https://uttyler.bncollege.com/c/System-Dynamics/p/MBS_588545_new?currentCampus=782&currentTerm=782_1_22_F&currentCourse=782_1_22_F_200_4312_3
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). • AI tools are allowed to support students' learning and productivity, provided that their use aligns with academic integrity standards. When required, students must disclose their use of AI.
Evaluation Method	Project / Report 20%, Mid-Term Exam 20% Final Exam 20%

	Homework / Quizzes 20% MATLAB/Simulink (Flipped Classes) 10% Course Participation 10% (In-class example, MATLAB online assignments, 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: 09/09/2024 First drop for non-payment: 09/03/2024 Second drop for non-payment: 09/18/2024 Last date to withdraw from one or more 15-week courses: 11/04/2024 Final date: TBD
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.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf