MENG 5330 – Process Control
Course Syllabus

Semester / Year	Fall 2023
Catalog Description	The course focuses on the use of controls in the process industry. The development of process models will involve measurement of variables, controller types, and final elements. Design and evaluation of controllers in processes including thermal systems will be carried out. General instrumentation design and practice will be conducted. Graduate students are expected to carry out a major project as an assignment within this course.
Prerequisites	MENG 4312 or EENG 4308
Section Number	MENG 5330.030, MENG 5330.040
Instructor Name	Dr. M. A. Rafe Biswas
Contact Information	Email: mbiswas@uttyler.edu , Zoom ID & Phone: 903 566 6115 , Office: HEC A214
Class Type / Instruction Mode / Location	Face-to-Face Lecture HEC C203/ Zoom Lecture RBN 2011
Class Time	Th 5:30PM - 8:15PM
Office Hours	MW: 2:30 PM – 4:00 PM, or By appointment
No. of Credits	3
Required Textbook	None
Optional References	Recommended textbooks (some available via library using patriots account) – - Chapter 8 Process control from Green, Don W., and Robert H. Perry. "Perry's chemical engineers' handbook." 8th Ed., McGraw-Hill Education (2007). - Chandra, Rames Panda, and T. Thyagarajan. Introduction to Process Modelling Identification and Control for Engineers, An, Alpha Science International, 2017. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=5426842 - Dale E. Seborg, Thomas F. Edgar, Duncan A. Mellichamp, and Francis J. Doyle, Process Dynamics and Control, 3rd Ed., John Wiley and Sons, New York (2010). Additional Material on Canvas: Websites, Class Handouts, Tutorials on MATLAB and Simulink by Mathworks, Inc.
Additional Rules and Requirements	MATLAB, Simulink & Simscape by MathWorks, Inc. (available through virtual desktop – one.uttyler.edu and IT support) The use of cellular phones during the lectures is prohibited. If a student uses the cellular phone (call, text, internet), he/she will be asked to leave the classroom and penalties of missing the class will apply. It is highly recommended to keep your cellular phone off.

Evaluation Method	Project 50%
	Assignments, Class Participation and Conduct 25%
	Exam 25%
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: September 1 Last date to withdraw from one or more 15-week courses: October 30 Final Project Report: Finals week (week of December 3)
Attendance / Makeup policy / other rules	Attendance is expected per university policy. Attendance of lectures may be regularly checked using Canvas. Make-up exams or assignments if approved will be administered during finals week. No email submission of assignment(s). All assignments MUST be submitted to Canvas for grading. Student with SAR status should contact the UT Tyler Office of Student Accessibility and Resources for exam arrangements. Any minor violation of the Student Behavior by a student will result in a full letter grade reduction for each incident and any single major violation such as cheating and plagiarism by a student will result in automatic failing grading in the course. Late submissions of assignments, lab reports (e.g., if due at 11:59:00 pm, then any time after such as 11:59:30 pm is late) will result in 10 % deduction per day from the graded score until down to 10% remaining. Late or no submission for any exam results in automatic grade of zero. Questions involving knowledge covered in class will be answered if the student proves that they have tried to come up with the answer. Solution to homework and quizzes will not be given. However, students can work on the right solution by checking their work with the instructor. Grade appeal: grades can be appealed by sending a Canvas message in written or typed format and then meeting the instructor during office hours, but no later than a week after the grade has been posted. Moreover, students may appeal any grade reduction to the instructor if valid excuse with documentation is provided. Note: your final semester grade is based on the 10-point scale. No curving or scaling will be applied even if you receive borderline grade such as 79.99.
Course Learning Objectives / ABET &	By the end of this course, students will be able to: 1. Ability to develop mathematical models and transfer functions of processes. 2. Analyze and model dynamic processes in time domain. 3. Utilize computational tools to design and analyze different types of control systems.

PEOs Relation	4. Able to read and interpret block diagrams, and process and instrumentation diagrams. 5. Relate the use of control systems to real-world problems.
Tentative Topics / Course Plans	• Mathematical modeling of different processes includes thermal fluid systems • Transfer Function and State-Space models • Characteristic Dynamic Behavior and Analysis of Processes including empirical modeling like machine learning • Advanced Control architectures including Feedback and Feedforward control • Control System Design, Tuning and Analysis • Process and instrumentation diagram • Self-directed project investigation.
University Policies	https://www.uttyler.edu/academic-affairs/files/syllabus_information_2021.pdf