## EE462: Fundamentals of Control Systems Engineering

Instructor	Name: Mahdi Tavakoli						
information	Office: ECERF W2-004						
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	Office hours: Mon, Wed, Fri 10:00-11:00 am; you are welcome to drop by at other times or						
	(preferably) send me an email to arrange an appointment						
Lab instructor	Lab Instructor: Ali Jazaveri (ali.jazaveri @ ualberta.ca)						
	Teaching Assistant: Noushin Miandashti (miandash @ ualberta.ca)						
Schedule	Lecture times: Mon, Wed, Fri 11:00-11:50 am						
information	Lecture location: NRE 1-143						
	Midterm exam: Fri March 2: 11:00-11:50 am in the lecture room						
Course	https://eclass.srv.ualberta.ca/portal/						
webnage	• A number of PowerPoint presentations have been posted on this website already						
webpuge	• A number of PowerPoint presentations have been posted on this website an eauy. They are incomplete now will be completed in class, and re-posted to the website						
	I recommend that you print and bring your conv of the incomplete notes to the						
	class and add your notes on them as I am writing on the slides						
Course	The overall objective of this course is to introduce the students to the study of control						
contont	The overall objective of this course is to introduce the students to the study of control average. As future angineers, the students will study the tools needed to evaluate the						
content	systems. As future engineers, the students will study the tools needed to evaluate the						
	desired performance goals. To this and the course will introduce:						
	The basis concents of dynamic systems and have to depart to the system.						
	• The basic concepts of dynamic systems and how to describe them via						
	mathematical models.						
	<ul> <li>Analysis of the fundamental characteristics of feedback control systems.</li> </ul>						
	The classical control techniques for designing feedback controllers.						
	The modern control techniques for designing feedback controllers.						
	The course and its lab will repeatedly use the knowledge of and skills in mathematics,						
	signals and systems theory, and Matlab programming.						
Marking	• Assignments: 10%						
scheme	Laboratories: 15%						
	• Midterm exam: 25%						
	• Final exam: 50%						
Textbook and	Textbook:						
references	• Norman S. Nise, Control Systems Engineering, 5 <sup>th</sup> or 6 <sup>th</sup> edition, Wiley,						
	• The Student Companion Site						
	http://bcs.wiley.com/he-bcs/Books?action=index&itemId=0471794759&bcsId=4135						
	for this textbook contains useful resources including computer programs for use with						
	MATLAB, additional appendices, and complete solutions to skill-assessment exercises						
	Other references for your interest:						
	Karl L Åström and Richard M. Murray. Feedback Systems: An Introduction for						
	Scientists and Engineers, 2008, Princeton University Press, This book is available						
	online for free: http://www.cds.caltech.edu/~murray/amwiki.						
	<ul> <li>Richard C. Dorf and Robert H Bishon, Modern Control Systems 11th edition 2008</li> </ul>						
	Prentice Hall.						
	Gene F Franklin I David Powell and Abhas Fmami-Naeini Feedback Control of						
	Dynamic Systems. 4th edition, 2002, Prentice-Hall.						

MATLAB /	•	MATLAB/Simulink is extensively used throughout the course. We will be using the						
Simulink		Control Systems Toolbox and the Symbolic Math Toolbox.						
	•	You shoul	You should already be familiar with MATLAB basics. Basic reviews of					
		MATLAB/	MATLAB/Simulink are contained in Appendices B and C of Nise. You can become more					
		familiar w	vith MA'	TLAB by running the control	demonstrations (In Matlab	o prompt, type		
		demo and	demo and follow Toolboxes >> Control Systems). Nise's Student Companion Site has					
		additiona	additional appendices regarding Matlab, too.					
Assignments	•	There are	There are six sets of assignments to be posted on the course website. The solution to					
		each assignment will also be posted on the website after its due date.						
	•	The Lab Instructor and the Teaching Assistant will mark your assignments.						
Lab						_		
				Section H3 (Wednesday)	Section H4 (Thursday)			
			Lab1	February 15	February 16			
			Lab2	February 29	March 1			
			Lab3	March 14	March 15			
			Lab4	March 28	March 29			
	•	You must attend all of the four lab sessions in your Section. The lab is ETLE 5-012.						
	•	A lab report is due by 4:00 pm, one week after you perform the lab, and should be put						
		into the EE 462 laboratory box outside the ECERF reception area.						
	•	Lab reports put in the box after 4:00 pm on the due date and before they are picked up						
		will receiv	7e a 25%	% penalty. No late reports wil	l be accepted once the box	is emptied.		
	•	Lab repor	ts shou	ld be clear, clean and stapled.				
	•	The Lab I	The Lab Instructor and the Teaching Assistant will mark your lab reports.					
Important	•	Policy abo	out cour	se outlines can be found in S	ection 23.4(2) of the Unive	rsity		
policies		Calendar.						
	•	The University of Alberta is committed to the highest standards of academic integrity						
		and honesty. Students are expected to be familiar with these standards regarding						
		academic nonesty and to uphold the policies of the University in this respect. Students						
		are particularly urged to familiarize themselves with the provisions of the Code of Student Pohaviour (online at						
		bttp://www.uofaweb.ualberta.ca/secretariat/studentappeals.cfm) and guoid gru						
		held which could not entially result in suspicions of cheating plagarism						
		misrepresentation of facts and/or participation in an offence. Academic dishonesty is a						
		serious offence and can result in suspension or expulsion from the University						
	•	Missed midterm exam and missed final exam can only be justified by documented						
		medical evidence.						
	•	You may use <i>approved non-programmable</i> calculators (with a gold sticker) in the						
		midterm and final exams as long as in compliance with the Faculty of Engineering's						
		Calculator Policy: <u>http://www.engineering.ualberta.ca/calculator.cfm</u> .						
		Obviously, calculators must not be used for any kind of cheating or communication						
		with other students during exams.						
	•	In the midterm exam, you can bring one formula sheet (letter-size, two-sided), but no						
		books, notes, or other materials.						
	•	In the final exam, you can bring two formula sheets (letter-size, two-sided), but no						
		books, notes, or other materials.						
	•	Recording is permitted only with the prior written consent of the professor or if						
		recording is part of an approved accommodation plan.						