ECE 561: Nonlinear Control Systems

Instructor information	Name: Mahdi Tavakoli Office: ECERF W6-037 Telephone: 780-492-8935 E-mail: mahdi.tavakoli@ualberta.ca Office hours: Mondays, Wednesdays and Fridays 10:30-11:30 am
Schedule information	Lecture times: Wed Fri, 9:00-10:20 am Lecture location: ECE W6 006 Midterm exam: Wednesday Oct 30, 09:00 -10:20 am in the lecture room Final exam: Will be scheduled by the Office of the Registrar and Student Awards
Course webpage	https://eclass.srv.ualberta.ca/ A number of PowerPoint presentations have been posted on this website already. They are incomplete now, will be completed in class, and re-posted to the website. I recommend that you print and bring your copy of the incomplete notes to the class, and add your notes on them as I am writing on the slides.
Course content	The course presents an introduction to nonlinear phenomena as well as techniques for analysis and design of nonlinear control systems. • Introductory examples; 2nd order systems • Mathematical Tools • Lyapunov Stability: Autonomous and non-autonomous Systems • Feedback Systems: Integrator back-stepping • Feedback linearization • Input-Output Stability • Input-to-State Stability • Passivity
Marking scheme	• Assignments: 5% • Midterm exam: 35% • Final exam: 60%
Textbook and selected references	• Nonlinear Control Systems: Analysis and Design, by H. J. Marquez, Wiley, 2003. Errata: http://www.ece.ualberta.ca/~marquez/Marquez_errata.pdf Additional reading: • Nonlinear Systems, by H. K. Khalil, 3rd edition, Prentice Hall, 2002. • Applied Nonlinear Control, by Jean-Jacques Slotine and Weiping Li, Prentice Hall, 1990.
MATLAB / Simulink	• Certain assignments may require knowledge of MATLAB/Simulink.
Assignments	• Five to six assignments will be posted on the course website. Each assignment will be due one week after it is posted by 4:00 pm at the ECE 561 assignment box (located outside the ECERF reception area on the 2nd floor). • Assignments put in the box after 4:00 pm on the due date and before they are picked up will receive a 25% penalty. No late assignments will be accepted once the box has been emptied. • Consultation with other students is permitted; however, the solutions handed in must be your own work. • Assignments will be marked roughly and returned to you at the end of the term.

Important policies	- Policy about course outlines can be found in Section 23.4(2) of the University 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 honesty 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 Behaviour (online at http://www.uofaweb.ualberta.ca/secretariat/studentappeals.cfm) and *avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, 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. - Recording is permitted only with the prior written consent of the professor or if recording is part of an approved accommodation plan. - Missed midterm exam and missed final exam can only be justified by documented medical evidence.
Calculator and formula sheet	- You may use *approved non-programmable* calculators (with a gold sticker) in the midterm and final exams as long as in compliance with the Faculty of Engineering's Calculator Policy: http://www.engineering.ualberta.ca/calculator.cfm. 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). You can bring two such formula sheets in the final exam. No books, notes, or other materials will be allowed in either exam.