

ME 534
Nonlinear Multivariate Control Systems
Spring 2007

Instructor: Kagan Tumer
Email: kagan.tumer@oregonstate.edu
Tel: 541 737 9899
Office: Rogers Hall 426

Class time and location: TR: 12:00-1:30 Rogers 332
Office Hours: Tue 2:00-3:00 (or by appt)
Course website: <http://classes.engr.oregonstate.edu/me/spring2007/me534/>

Prerequisite(s):
ME 531, ME 533, knowledge of at least one programming language (C/C++, Java).

Textbook:

- Nonlinear Systems, H. K. Khalil, 3rd Edition, Prentice Hall. ISBN 0-13-067389-7

Additional Books:

- Stable Adaptive Control and Estimation for Nonlinear Systems, J.T. Spooner, M. Maggiore, R. Ordonez and K. M. Passino, Wiley, New York.
- Nonlinear Control Systems, H. J. Marquez, Wiley, New Jersey.
- A First Course in Fuzzy and Neural Control, H. Nguyen, N. R. Prasad, C. L. Walker, and E. A. Walker, Chapman & Hal/CRC, Florida.

Learning Objectives: By the end of the course students will be able to:

- State stability criteria for nonlinear systems
- Apply linearization techniques to nonlinear systems
- Use neural networks to control nonlinear systems

Grading policy:	Class Participation	10%
	Homework	20%
	Midterm	30%
	Final Project	40%

Academic Integrity: You are permitted, and to a great extent encouraged, to work with others on homework sets. However, there is an obvious difference between constructive discussion of a particular problem and copying. Acts of academic dishonesty will not be tolerated and will be handled according to university policy. (see: <http://oregonstate.edu/admin/stucon/achon.htm>)

Policy Regarding Students With Disabilities: Accommodations for students with disabilities will be made according to University policy. Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 737-4098.

Class Schedule:

This schedule is an outline of the topics that will be covered during the course of the term as well as the book material supporting those topics.

Week	Date	Lecture Title	Assignments
1	4/3	Course Intro	
	4/5	Mathematical Foundations	
2	4/10	2 nd order systems; Linearization	
	4/12		HW 1 Due
3	4/17	Stability (Lyapunov)	
	4/19	Project Discussion/Selection	
4	4/24	Neural Networks	
	4/26		HW 2 Due
5	5/1	Neural Control	
	5/3		Project Plan Due
6	5/8	Fuzzy Control	
	5/10		HW 3 Due
7	5/15	MIDTERM	
	5/17	No Class	
8	5/22	Markov Decision Processes	
	5/24		HW 4 Due
9	5/29	Applications	
	5/31		Project Due
10	6/5 – 6/7	Project Presentations	