

ME/ECE 859 - Spring 2019
NONLINEAR SYSTEMS AND CONTROL

Instructor: H.K. Khalil; Room 2308F EB; Tel. 355-6689; E-mail khalil@msu.edu
Class Schedule: Tu Th 8:30 – 9:50, Room 118 Farrall Ag Eng Hall
Office Hours: M W 11:00 – 12:00
 (If you have conflict with the scheduled office hours, send e-mail to H. Khalil to arrange for other times)

Textbook: H.K. Khalil, Nonlinear Control, Pearson Education, 2015
Textbook Homepage: <https://www.egr.msu.edu/~khalil/NonlinearControl>

Recommended

Background ECE/ME 851 (Linear Systems and Control)

MATLAB & SIMULINK Tutorial:

<http://www.ctms.engin.umich.edu/CTMS/index.php?aux=Home>

D2L: The following material will be posted on D2L (d2l.msu.edu).

- Lecture slides
- MATLAB and JAVA pplane programs
- Homework assignments (one week before the due date)
- Homework solutions (after the due date)

Grading

Grading is based on the following table

Homework	Exam 1	Exam 2	Exam 3
25%	25%	25%	25%

Grading is assigned using the following straight scale

Percent	85-100	75-84	65-74	55-64
Grade	4	3.5	3	2.5

- All exams are open book and notes.
- Solutions of homework assignments should be uploaded as pdf files to a homework submission folder in D2L by 8 AM on the due date. No extensions will be granted. Unreadable files will not be graded and the student will not be allowed to re-upload after the due date. You must make sure that the uploaded file is readable.
- Every student is expected to submit his/her own work.
- It is highly recommended that students read the part of the book that corresponds to a lecture before the lecture.

Exam Schedule

Exam 1: Thursday, February 7, 8:30 – 9:50 (covers Lectures 1 – 8)
 Exam 2: Tuesday, March 26, 8:30 – 9:50 (covers Lectures 9 – 17)
 Exam 3: Tuesday, April 30, 8:30 – 9:50 (covers Lectures 18 – 25)

Important: Please read the Spartan Code of Honor at
<http://asmsu.msu.edu/initiatives/spartan-code-of-honor/>

Lecture Plan

Lecture #	Date	Topic	Textbook chapter	HW Due
1	Tu 1/8	Introduction	1	
2	Th 1/10	Two-dimensional systems	2	
3	Tu 1/15	Stability of equilibrium points	3	HW 1
4	Th 1/17			
5	Tu 1/22			
6	Th 1/24	Time-varying & pert systems	4	HW 2
7	Tu 1/29			
8	Th 1/31	Passivity	5	
	Tu 2/5	Review		HW 3
	Th 2/7	Exam 1		
9	Tu 2/12	Passivity & IO Stability	5 & 6	
10	Th 2/14	IO Stability	6	
11	Tu 2/19	Stability of feedback systems	7	
12	Th 2/21			HW4
13	Tu 2/26	Special nonlinear forms	8	
14	Th 2/28			
15	Tu 3/12	State Feedback Stabilization	9	HW 5
16	Th 3/14			
17	Tu 3/19			
	Th 3/21	Review		HW 6
	Tu 3/26	Exam 2		
18	Th 3/28	Robust SF stabilization	10	
19	Tu 4/2			
20	Th 4/4			HW 7
21	Tu 4/9	Observers	11	
22	Th 4/11	Output feedback stabilization	12	
23	Tu 4/16			HW 8
24	Th 4/18	Tracking & Regulation	13	
25	Tu 4/23			
	Th 4/25	Review		HW 9
	Tu 4/30	Exam 3		