

Nonlinear Control - ELEC9732

Session II 2017

Prerequisites:
Control -State Space
Linear Algebra

Instructor: Prof Victor Solo Office: MSEB
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UOC: 6
Class Times: Tuesday, 6pm-9pm Room: TBA
Prerequisites: Undergraduate Control Course
Office Hours: Thursday, 4pm-5pm Room: TBA

Aims: Provide an introduction to nonlinear systems analysis and an introduction to nonlinear control design.

Assessment: Homework 50%
Final Exam (Take-home) 50%
Homeworks are to be completed on your own.
You cannot discuss with others.
You cannot copy from any source.
The work that you hand in (and any related working) must be yours alone.
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Resources:

Software: Matlab

Textbook: none.

References: in Library Open Reserve

i JJ Slotine, W Li (1991). Applied Nonlinear Control (Prentice Hall)

ii H Khalil (1996,2002) Nonlinear Systems (Prentice Hall)

iii S Sastry (1999) Nonlinear Systems (Springer).

iv A Isidori (1995) Nonlinear Control (Springer).

Timetable for Item	Homeworks, Project, Exam Dates(week)	Late Homeworks are penalized.
HW 1	out - week 4	due - week 6, School Office, Homework Box, 5th Floor MSEB
HW 2	out - week 6	due - week 8, School Office, Homework Box, 5th Floor MSEB
HW 3	out - week 8	due - week 10, School Office, Homework Box, 5th Floor MSEB
Final Exam	out - Tuesday October 17(week 12)	due - Friday October 27th, 4pm, Homework Box, 5th Floor MSEB

Teaching Strategies

Lectures to give the basic material in written form, and to highlight the importance of different sections and help with the formation of schema.

Assignments to give practice in problem solving, and to assess your progress.

Examination the final test of competency.

Learning Outcomes

At the end of the course the student will be familiar with basic aspects of nonlinear systems and control, from both an analysis and a design point of view. The student will be able to use this knowledge to solve basic problems in nonlinear systems analysis and nonlinear control design.

Academic Honesty and Plagiarism

Plagiarism means copying. You cannot copy other peoples work of any kind; you cannot copy from any source. Plagiarism is a serious offence and (severe) penalties will apply; see <http://www.lc.unsw.edu.au/plagiarism>

Administrative Matters

For special needs, equity and diversity, occupational health and safety, enrolment, rights, and general expectations of students; see <http://scoff.ee.unsw.edu.au/>.

Week	Topic
1	Introduction
2	Nonlinear Ordinary Differential Equations
3	Phase Plane Methods
4	Lyapunov Stability
5	Input/Output Stability
6	Describing Functions
7	Nonlinear Control - Introduction
8	Feedback Linearization
9	State Feedback Linearization
10	Gain Scheduling
11	Sliding Mode Control
12	Backstepping Design Method