Nonlinear Control - ELEC9732
Session II 2015

Instructor: Prof Victor Solo         Office: Room 237
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UOC: 6                             
Class Times: Wednesday, 6pm-9pm    Room: TBA
Prerequisites: Undergraduate Control Course
Office Hours: Monday, 4pm-5pm

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

Assessment: Homework 30%
Final Exam (Take-home) 40%
Project (Report + talk) 30%

Homeworks are to be completed on your own. You may discuss with other students. But you cannot copy from them or any other source.
NB. No details of working ⇒ no marks.
Exams are to be completed on your own. You cannot discuss with others. And you cannot copy from any source.
The work that you hand in (and any related working) must be yours alone.

Project: The project is intended to be a piece of work bigger than any homework could be. This gives the student a chance to go into a topic in some detail.
It will consist of repeating simulations in a research paper + background material: mathematical description of system; system analysis; control design.
1-2 students per group. No more than two groups per project.
One independent report from each student + oral presentation.
Use IEEE-CDC style (max 6-10pp) for the report; you must cite the original papers used.

All projects involve SIMULINK modelling.

Available projects are (see web page):
Hovercraft modelling and control  Double Inverted Pendulum
Bicycle modelling and control    Teleoperation
Spherical Pendulum               Surface vehicle
Stirred Tank Reactor            Optimal Attitude Control
or - A relevant project of interest proposed by the student and approved by the instructor.
Resources:

Software: Matlab
Textbook: none.
References: in Library Open Reserve

Timetable for Homeworks, Project, Exam

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<td>HW 1</td>
<td>out - week 4</td>
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<td>HW 2</td>
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<td>HW 3</td>
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Project

Email 2 topics in order of preference: due Tuesday August 18(week 4)
One page proposal due Friday August 21(week 4) (specify division of work if 2 students)
Talks held week TBA
Report due - Wednesday October 21(week 12)

Final Exam

out - Wednesday October 21(week 12) due - Friday October 30th

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/.
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