Course Outline

Term 1 2020

MTRN3020

MODELLING AND CONTROL OF MECHATRONIC SYSTEMS

Contents

The normal workload expectations of a student are approximately 25 hours per term for each UOC, including class contact hours, other learning activities, preparation and time spent on all assessable work.

You should aim to spend about 15 h/w on this course. The additional time should be spent in making sure that you understand the lecture material, completing the set assignments, further reading, and revising for any examinations.

Contact hours

	Day	**Time**	**Location**
Lectures (Web	Thursday	10 am-12 noon	Colombo Theatre A

seamless continuation of your learning. The provision of the learning environment in the laboratory is to facilitate developing confidence in managing laboratory tasks as projects. The content delivered in the lectures will be used to design controllers and then to apply them to control real-life systems. Demonstrators in the laboratories are there to provide you all the guidance and assistance is managing the laboratory tasks.

5.

Week	Topic	Location	Suggested Readings
1	Introduction and How Control Systems Work	Colombo Theatre A	Refer to the week 1 on Moodle and watch the videos if any
2	Modelling, Transfer Functions and State Space Representation	Colombo Theatre A	Refer to the week 2 on Moodle and watch the videos if any
3	Root Locus followed by Introduction to Discrete-Time Systems	Colombo Theatre A	Refer to the week 3 on Moodle and watch the videos if any
4	z-transforms and Discrete-Time Transfer Functions	Colombo Theatre A	Refer to the week 4 on Moodle and watch the videos if any
5	Stability followed by Discrete Equivalents of Continuous-time Systems	Colombo Theatre A	Refer to the week 5 on Moodle and watch the videos if any
6	Flexibility Week		
7	Direct Design: Discrete Controller Design Using Root Locus	Colombo Theatre A	Refer to the week 7 on Moodle and watch the videos if any
8	Direct Design: Discrete Controller Design Using Direct Analytical Method	Colombo Theatre A	Refer to the week 8 on Moodle and watch the videos if any
9	Indirect Design: Discrete Controller Design Using Bode Method	Colombo Theatre A	

6. Assessment

Assessment overview

Task	Assessment	Group Project?	Length	Weight	Learning outcomes assessed	Assessment criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
T1	Pendulum	No	A full report as per submission specifications.	10%	1 and 2	Refer to laboratory specification for ex7 75.0 g0 G[ )]┐			

Assignments

Presentation

During experimentations, each student will collect his/her own personalized data. It is essential that each student use his/her personalized data in his/her reports.

All submissions are expected to be neat and clearly set out. Your results are the pinnacle of all your hard work and should be treated with due respect. Presenting results clearly gives the marker the best chance of understanding your method, even if the numerical results are incorrect.

Submission

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of 20 percent (20%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day.

be awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These are clearly indicated in the course outline, and such assessments receive a mark of zero if not completed by the specified date. Examples include:

a. Weekly online tests or laboratory work worth a small proportion of the subject mark, or
b. Online quizzes where answers are released to students on completion, or
c. Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date, or
d. Pass/Fail assessment tasks.

Marking

Marking guidelines for assignment submissions will be provided at the same time as assignment details to assist with meeting assessable requirements. Submissions will be marked according to the marking guidelines provided.

Examinations

You must be available for all quizzes. This course has no final examination.

Calculators

You will need to provide your own calculator of a make and model approved by UNSW for

the examinations. The list of approved calculators is available at student.unsw.edu.au/exam-approved-calculators-and-computers

It is your responsibility to ensure that your calculator is of an approved make and model, and Engineering Student Supper Services Centre

9. Academic honesty and plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectu9f

Competencies

Stage 1 Competencies for Professional Engineers

Program Intended Learning Outcomes