Liverpool John Moores University

Title:	CONTROL ENGINEERING
Status:	Definitive
Code:	**5509NCCG** (129442)
Version Start Date:	01-08-2021
Owning School/Faculty:	Engineering
Teaching School/Faculty:	Nelson Campus

Team	Leader
Christian Matthews	Y

Academic Level:	FHEQ5	**Credit Value:**	20	**Total Delivered Hours:**	60
Total Learning Hours:	200	**Private Study:**	140		

Delivery Options
Course typically offered: S1, S2, Sum, NS2 (S2 for Jan)

Component	Contact Hours
Lecture	48
Practical	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Assignment	Assignment	100	

Competency	NCC Group Pass/Fail

Aims

This module teaches students to design and analyse complex and modern dynamic system modelling and control with MATLAB/Simulink simulation demonstrations. It involves the understanding and using of analytical techniques, interpretation of tasks between customers and designers, and computational experiments as applied to classical and modern dynamic system models.
Students will develop a robust knowledge and understanding in classical, modern,

and digital control system analysis and design as expected of an electronics engineer. Students will use industry standard software to develop and evaluate conceptual and analytical models.

Learning Outcomes

After completing the module the student should be able to:

1	Demonstrate an understanding of the principles of closed-loop control, transfer function models, stability and time response analysis, for continuous and discrete domain systems.
2	Model physical systems and use mathematical tools such as Laplace and simple Z transforms, transfer functions and block diagrams to analyse/design simple single input/output control systems.
3	Understand pole-zero diagrams and assess stability
4	Specify systems in terms of time/frequency and other performance criteria, and design systems to specifications

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Assignment	2	3	4
NCC Group Pass/Fail	1		

Outline Syllabus

Classical control system analysis and design.
Control mathematics, Laplace transform, z-transform, differential equations, and difference equations, control system modelling, analysis, and design.
Investigation of stability criteria.
Systems specification and performance estimation.
Use of computational packages, such as Matlab, to analyse and design control systems.

Learning Activities

Lectures

These will not normally be traditional didactic lectures in which the student plays little active part, but will be delivered in small groups of up to 20 students in which their interaction with their tutor is a key ingredient of their learning experience.

The material of this module requires the development of significant practical skill. This will be taught within the lecture time, making these sessions a blend of lecture and workshop time. The sessions will be timetabled in spaces with physical resources appropriate to the delivered content.

Students will receive approximately 30 hours of taught material, supported by in-class exercises and discussions designed to help student assimilate learning and to provide early informal feedback on their progress.

Practical Work

This module contains directed practical work that students will undertake under the supervision of teaching staff and/or technicians. Some elements of this practical work will form part of the assessment for this module.

Independent Study

Students are expected to undertake personal reading and research into topic areas that have been stimulated from the lectures and seminars. This reading will enhance their academic work and enable valid contribution to lectures and seminars.

VLE support

This will provide links to academic web-sites and on-line journals, facilitate group discussion outside of the classroom, access to outline lecture notes, and provide students with assessment details.

Notes

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