

Summary Information

Module Code	7422MEPC
Formal Module Title	Dynamic Systems Simulation
Owning School	Engineering
Career	Postgraduate Taught
Credits	20
Academic level	FHEQ Level 7
Grading Schema	50

Teaching Responsibility

LJMU Schools involved in Delivery
Engineering

Learning Methods

Learning Method Type	Hours
Lecture	11
Practical	33

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	12 Weeks

Aims and Outcomes

Aims	This module is designed to introduce complex dynamic systems simulation using Matlab/Simulink, and Interface of computer controlled system and simulation with LabView.
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After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Create MATLAB programs to solve high-order ODEs
MLO2	2	Formulate a Simulink simulation of complex control systems of nonlinear, multivariable and discrete-time systems.
MLO3	3	Interface a physical system with computer and design and simulate the system using LabView

Module Content

Outline Syllabus	Matlab/Simulink: Solving higher-order ODEs with Matlab; Simulate complex dynamic systems with Simulink. Optimal Design of PID controllers with Simulink functions. Real-time control simulation with Matlab/Simulink. Understanding the architecture of a LabVIEW virtual instrument in terms of front panel and block diagram views, and building a VI with loops, case, shift register, arrays and clusters, local variable, global variable, read/write files, and sub-VI, etc. Understanding the dataflow model of execution in LabVIEW. Using the LabVIEW User Interface to connect hardware control system for control and monitoring.
Module Overview	
Additional Information	This is a level 7 module for students to learn how to use Matlab/Simulink and LabView to model, simulate, interface and control a dynamic system. United Nations Sustainable Development Goals: 4. Quality Education, 7. Affordable and Clean Energy, 8. Decent Work and Economic Growth, 9. Industry, Innovation and Infrastructure

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Presentation	System simulation with Matlab	50	0	MLO1, MLO2
Technology	Design & simulation in LabView	50	0	MLO3

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Dingli Yu	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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