Modelling and Simulation

Module Information

2022.01, Approved

Summary Information

Module Code	7304SDM
Formal Module Title	Modelling and 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	22
Tutorial	6

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 Matlab coding for scientific computation, and system simulation using Simulink.The module will enable students with a background in using a traditional high-level programming language, but no experience using National Instruments (NI) LabVIEW, to create virtual Instruments (VI's) and interface them with compatible hardware for data acquisition (DAQ) and control applications.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Use complex Matlab coding to solve complex ODEs and other high level scientific computation problems.
MLO2	2	Simulate dynamic systems with Simulink.
MLO3	3	Construct a range of LabVIEW VI's which demonstrate the typical functionality encountered in industrial and research applications.

Module Content

Outline Syllabus	Matlab coding: vector/matrix input and calculation, loop coding, condition coding, plot curves, coding and calling functions, M-file coding, M-file debugging.Solving ODEs: dynamic system modelling, numerical methods for solving ODEs including fourth order Runge Kutta method, solving ODEs.Simulink with Matlab: data communication including From workspace, To workspace, import and outport, calling Simulink model from Matlab.Simulation with Simulink: dynamic system simulation examples with Matlab and Simulink.Using the LabVIEW User Interface to navigate the LABVIEW software, and to find help using the built indocumentation system.Understanding the architecture of a LabVIEW virtual instrument in terms of front panel and block diagram views. Introduce commonly used tools in the control and function palettes.Understanding the dataflow model of execution in LabVIEW.
Module Overview	This module is designed to introduce Matlab coding for scientific computation, and system simulation using Simulink. The module will enable students with a background in using a traditional high-level programming language, but no experience using National Instruments (NI) LabVIEW, to create virtual Instruments (VI's) and interface them with compatible hardware for data acquisition (DAQ) and control applications.
Additional Information	This is a level 7 module for students to learn how to use Matlab/Simulink & LABVIEW for scientific computation and dynamic system simulation.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Report	Demo and report	100	0	MLO1, MLO2, 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