

Liverpool John Moores University

Title: Dynamic Systems Simulation
Status: Definitive
Code: **7003ELE** (120071)
Version Start Date: 01-08-2018

Owning School/Faculty: Electronics and Electrical Engineering
Teaching School/Faculty: Electronics and Electrical Engineering

Team	Leader
Dingli Yu	Y

Academic Level: FHEQ7 **Credit Value:** 10 **Total Delivered Hours:** 44
Total Learning Hours: 100 **Private Study:** 56

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	24
Practical	6
Tutorial	12

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Exam	70	2
Report	Report	Assignment	30	

Aims

To develop for students dynamic system simulation method and the techniques using Matlab/Simulink.

Learning Outcomes

After completing the module the student should be able to:

- 1 Construct mathematical models for simple engineering systems.
- 2 Discuss numerical methods for solving ODEs.
- 3 Use graphical methods to build simulation models of dynamic systems using appropriate software
- 4 Apply appropriate software to simulate dynamic systems.

Learning Outcomes of Assessments

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

Exam	1	2	3	
Assignment	1	2	3	4

Outline Syllabus

*Introduction to simulation and dynamic system modelling.
Numerical methods to solve ODEs: Euler method, Runge-Kutta method.*

*Introduction of Matlab: matrix operations, plots, etc.
Matlab programming: loops, functions, conditional statements, etc.
Introduction to Simulink: real time and iteration number, sample times,
Build Simulink models based on differential equations.
Data communication between Matlab and Simulink.
Simulation of dynamic systems by calling Simulink model.
Discrete time simulations using Simulink.*

Learning Activities

By lectures, tutorials and practical example programming.

Notes

This is a MSc module with which students will learn how to use Matlab/Simulink to simulate a dynamic system.