

Liverpool John Moores University

Title: Dynamic Systems Simulation
Status: Definitive
Code: **7303ELE** (121447)
Version Start Date: 01-08-2019

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

Team	Leader
Dingli Yu	Y

Academic Level: FHEQ7 **Credit Value:** 20 **Total Delivered Hours:** 36
Total Learning Hours: 200 **Private Study:** 164

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	12
Practical	24

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Report	Assignment	40	
Report	Report	Assignment	60	

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 Derive mathematical models for simple dynamic systems.
- 2 Discuss numerical methods for solving ODEs.
- 3 Use graphical methods to build Simulink models of dynamic systems.
- 4 Apply appropriate software to simulate dynamic systems.

Learning Outcomes of Assessments

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

Assignment 1	1	2	3	
Assignment 2	1	2	3	4

Outline Syllabus

Introduction to simulation and dynamic system modelling.
Numerical methods for solving ODEs: Euler method, Runge-Kutta method.
Introduction to Matlab: matrix operations, plots, etc.
Matlab programming: loops, functions, conditional operations, 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

Lectures with teaching notes;
 Practical example programming and simulation using Matlab/Simulink.

Notes

This is an level 7 in MENG or MSc module with which students will learn how to use Matlab/Simulink to simulate a dynamic system.