Power Systems Modelling and Analysis

Module Information

2022.01, Approved

Summary Information

Module Code	7424MEPC
Formal Module Title	Power Systems Modelling and Analysis
Owning School	Engineering
Career	Postgraduate Taught
Credits	10
Academic level	FHEQ Level 7
Grading Schema	50

Teaching Responsibility

LJMU Schools involved in Delivery
Engineering

Learning Methods

Learning Method Type	Hours
Lecture	22

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	To develop an understanding of the power system component modelling for steady-state analysis and the types of problems encountered in power system analysis.To consider the principles of voltage and reactive power control in power systems.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Undertake complex modelling of various components of a power system, as required for steady-state power system analysis.
MLO2	2	Design systems for reactive power compensation and voltage control in the power system.
MLO3	3	Critically analyse symmetrical and asymmetrical fault conditions in the power system.

Module Content

Outline Syllabus	Load modelling (constant impedance representation) and modelling of reactive power compensators. Star-delta and delta-star impedance transformation.Impedance drop, voltage and voltage regulation.Modelling of two-winding and three-winding three-phase transformersModelling of short and medium-length overhead transmission lines, cable modelling. Modelling of synchronous generators (turbo- and hydro-machinery)Per unit system and representation of the power system components in per unit. Calculation of voltages in various nodes of the power system.Symmetrical components and sequence networks of power system components. Faults in power systems: three-phase symmetrical short-circuitFaults in power systems: asymmetrical short circuit analysis using symmetrical Components.Reactive power compensation using synchronous condensers and static VAr compensators.On-load tap changing transformers.
Module Overview	
Additional Information	This level 7 module introduces the principles of power system modelling, analysis and control.UNESCO Sustainable Development Goals1. No Poverty2. Good Health and Wellbeing3. Quality Education4. Gender Equality5. Affordable and Clean Energy6. Decent Work and Economic Growth7. Reduced Inequalities8. Sustainable Cities and Communities

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Centralised Exam	Examination	100	1.5	MLO1, MLO2, MLO3

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Martin Jones	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings