

Power System Analysis

Module Information

2022.01, Approved

Summary Information

Module Code	5508ICBTEL
Formal Module Title	Power System Analysis
Owning School	Engineering
Career	Undergraduate
Credits	15
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
International College of Business and Technology

Learning Methods

Learning Method Type	Hours
Lecture	45
Off Site	6
Tutorial	9

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
APR-PAR	PAR	April	12 Weeks

JAN-PAR	PAR	January	12 Weeks
SEP-PAR	PAR	September	12 Weeks

Aims and Outcomes

Aims	This module introduces the student to fundamentals of an Electrical power system. Moreover, the student is introduced to three phase symmetrical/unsymmetrical faults, and analysing/solving power quality and harmonic problems.
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After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Summaries basic power generation along with per unit values in an electrical power system and describe the single line representation of the power system.
MLO2	2	Analyse a three phase power systems and transmission line parameters.
MLO3	3	Solve power flow calculations
MLO4	4	Analyse three phase symmetrical/unsymmetrical fault and apply power quality and harmonic problems

Module Content

Outline Syllabus	Introduction and Basic concepts Power System Representation/ Power Generation Single Line Diagram Per Unit System for single phase circuits Per Unit System for three phase circuits Transmission Lines Transmission Line Representation AC vs. DC transmission Standard Transmission Voltages Series Impedance Calculation : Resistance, Inductances and Capacitances Short, Medium and Long line models; A,B,C,D constants Efficiency and Voltage regulations Series and Shunt Compensations Power Flow Power Flow Calculations Review of Real, Reactive and Apparent Power Gauss-Seidel Load Flow Method Newton-Raphson Load Flow Method Decoupled Load Flow Method Contingency calculations DC Load Flow Three Phase Systems Three Phase Fault Calculations Symmetrical fault Symmetrical components Positive, Negative and Zero sequence equivalent circuits Unsymmetrical Faults : L-G, L-L-G, L-L faults Circuit Breaker ratings.
Module Overview	
Additional Information	

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Exam	Exam	70	3	MLO3, MLO4, MLO2
Essay	Coursework	30	0	MLO1

Module Contacts

Module Leader

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

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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