This Version is No Longer Current
The latest version of this module is available here

MODULE DESCRIPTOR

Module Title

Power Systems Analysis and Protection

Reference	EN4561	Version	6
Created	July 2017	SCQF Level	SCQF 10
Approved	March 2004	SCQF Points	15
Amended	August 2017	ECTS Points	7.5

Aims of Module

To provide students with the ability to analyse electrical power systems under steady state and transient conditions and to devise methods to protect them using modern protection techniques

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1	Apply advanced techniques for the analysis of load flow problems and power system stability.
2	Analyse and discuss power system protection strategies.
3	Evaluate the economic operation of power generation.
4	Use MATLAB to analyse and simulate a power system case study involving load flow.

Indicative Module Content

Power System Analysis Analytical techniques for load flow and stability analysis for modern industrial power systems. Power System Protection Basic components and characteristics of protection systems, CT's, VT's and relays. Unit and non-unit schemes. Examples of protective schemes, overcurrent protection, differential protection, distance protection. Power System Operation and Control Modern trends in the control and operation of electrical power systems,economic dispatch.

Module Delivery

This is a lecture based course supplemented by tutorials and student centred learning

Indicative Student Workload	Full Time	Part Time
Contact Hours	42	42
Non-Contact Hours	108	108
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
Actual Placement hours for professional, statutory or regulatory body		

Module Ref:	EN4561 v6

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	30%	Outcomes Assessed:	4
Description:	Case study analysis				

Component 2

Type:	Examination	Weighting:	70%	Outcomes Assessed:	1, 2, 3
Description:	Closed book examination				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

To pass the module, you must achieve at least a 40% weighted average mark in the exam and coursework. In addition you need to achieve at least 35% in both the individual exam and coursework components.

Module Grade	Minimum Requirements to achieve Module Grade:
A	>70%
B	60-69%
C	50-59%
D	40-49%
E	35-39%
F	0-34%
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	EN3561 Electrical Power and Energy Systems
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	GEC ALSTHOM Ltd, 1987. Protective Relays - Application Guide. 4th ed. Stafford: EEC
2	CONEJO, A. J. and BARINGO, L., Power System Operation, Springer, 2018.
3	BIGGAR, D.R. and HESAMZADEH, M.R., The Economics of Electricity Markets, J Wiley, 2014
4	BAYLISS, C. R. and HARDY, B. J. Transmission and Distribution Electrical Engineering, Oxford, UK: Elsevier, 2012.
5	GRIGSBY, L. L., The Electric Power Engineering Handbook, CRC, 2000, p. 1496.