

Module Title Power Systems Analysis And Protection	Reference EN4561 SCQF SCQF Level 10 SCQF Points 15 ECTS Points 7.5 Created January 2004 Approved March 2004 Amended August 2011 Version No. 4
Keywords Load flow analysis, power system stability, power system protection, economic dispatch.	

This Version is No Longer Current

The latest version of this module is available [here](#)

Prerequisites for Module

EN3561 Electrical Power and Energy Systems

Power System Operation and Control

Corequisite Modules

None.

Modern trends in the control and operation of electrical power systems, economic dispatch.

Precluded Modules

None.

Indicative Student Workload

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

	Full Time	Part Time
<i>Contact Hours</i>		
Assessment	6	6
Lectures	24	24
Tutorials	12	12
<i>Directed Study</i>		
	53	53
<i>Private Study</i>		
	55	55

ment 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.

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.

Mode of Delivery

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

Assessment Plan

	Learning Outcomes Assessed
Component 1	1
Component 2	1,2,3

Component 2 is a closed book examination. (Weighting 70%)

Component 1 will consist of a case study analysis. (Weighting 30%)

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.

problem.

5. GRIGSBY, L. L., The Electric Power Engineering Handbook, CRC, 2000, p. 1496.