

Title:	Power Distribution APPROVED
Long Title:	Electrical Power Distribution
Module Code:	ELEC6027
Credits:	5
NFQ Level:	Fundamental
Field of Study:	Electrical Engineering
Valid From:	Semester 1 - 2016/17 (September 2016)
Module Delivered in	3 programme(s)
Module Coordinator:	JOSEPH CONNELL
Module Author:	SRETO BOLJEVIC
Module Description:	This module provides the student with an understanding of the broad range of principles and practices underpinning industrial and commercial power distribution.
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
LO1	Outline and explain operational practices of MV/LV distribution system.
LO2	Describe and explain design and analysis techniques appropriate for MV/LV distribution system.
LO3	Describe and explain calculations procedure to determine the fault levels on MV/LV distribution system installations.
LO4	Describe and explain MV/LV distribution system protection design and operation.
LO5	Select suitable size of equipment employed by the MV/LV distribution system to facilitate variety of industrial and commercial premises.
Pre-requisite learning	
Module Recommendations	
<i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named CIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i>	
No recommendations listed	
Incompatible Modules	
<i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module. You may not earn additional credit for the same learning and therefore you may not enrol in this module if you have successfully completed any modules in the incompatible list.</i>	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements	
<i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.</i>	
No requirements listed	
Co-requisites	
No Co Requisites listed	

Module Content & Assessment

Indicative Content

Distribution practice.

MV/LV distribution system operational practice. MV radial, ring and parallel systems. Switching operation of MV/LV distribution system. Earthing and protection system of MV/LV distribution system

Design and analysis techniques

Balance/Unbalance Three-phase system analysis. Per-unit system methods

Fault level

Fault calculations for MV/LV distribution systems. Effects of source and transformers and other distribution system components on fault level. Types of fault, switching transient, asymmetrical factor, motor contribution. MV/LV distribution system impedance.

MV/LV Protection System

MV/LV circuit breaker, MV/LV switchgear. Fault limitation and protection system coordination and discrimination.

MV/LV distribution system equipment selection

MV/LV distribution system equipment selection regarding: capacity, reliability, power quality, volt-drop and environmental conditions

Assessment Breakdown	%
Course Work	40.00%
End of Module Formal Examination	60.00%

Course Work

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Short Answer Questions	distribution systems	1,2	20.0	Week 4
Short Answer Questions	Fault levels, protection in MV/LV systems	3,4	20.0	Week 9

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	End-of-Semester Final Examination	1,2,3,4,5	60.0	End-of-Semester

Reassessment Requirement

Repeat examination

Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.

The institute reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time

<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Lecture material.	3.0	Every Week	3.00
Independent & Directed Learning (Non-contact)	Self directed learning.	4.0	Every Week	4.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				3.00

Workload: Part Time

<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Lecture material	3.0	Every Week	3.00
Independent & Directed Learning (Non-contact)	Study	4.0	Every Week	4.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				3.00

Module Resources
<i>Recommended Book Resources</i>
<ul style="list-style-type: none"> • Geoffrey Stokes 2003, <i>Handbook of Electrical Installation Practice</i>, 4th Ed., Blackwell [ISBN: 0.632.06002.6] • Electro-Technical Council of Ireland Limited 2008, <i>National Rules for Electrical Installations</i>, Fourth Ed., Electro-Technical Council of Ireland • Robert B. Hickey 2004, <i>Electrical Engineer's Portable Handbook</i>, Chapters 3,4,5, McGraw Hill [ISBN: 0071418202] • Stan Stewart 2008, <i>Distribution Switchgear</i>, Institution of Electrical Engineers [ISBN: 0852961073]
<i>Supplementary Book Resources</i>
<ul style="list-style-type: none"> • Simens/Gunter S. Seip (Ed.) 2000, <i>Electrical Installation Handbook</i>, 3rd Ed., Willey [ISBN: 0.471.49435.6] • T. Davies 2006, <i>Protection of Industrial Power Supplies.</i>, Newnes [ISBN: 0.7506.2662.3]
<i>This module does not have any article/paper resources</i>
<i>This module does not have any other resources</i>

Module Delivered in			
Programme Code	Programme	Semester	Delivery
CR_EEPSY_8	<u>Bachelor of Engineering (Honours) in Electrical Engineering</u>	3	Mandatory
CR_EELEC_7	<u>Bachelor of Engineering in Electrical Engineering</u>	3	Mandatory
CR_EELEC_6	<u>Higher Certificate in Engineering in Electrical Engineering</u>	3	Mandatory