



MODULE SPECIFICATION

Part 1: Information			
Module Title	Electrical Technology		
Module Code	UFMFQ8-30-2	Level	Level 5
For implementation from	2019-20		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Module type:	Standard		
Pre-requisites	Engineering Mathematics 2019-20		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p>Educational Aims: In addition to the learning outcomes the educational experience may explore, develop, and practise but not formally discretely assess the following:</p> <p>Handling simulation software such as PSCAD, ATPDraw and MATLAB.</p> <p>Familiarity in obtaining, searching and interpreting technical literature and other documentation from various sources.</p> <p>An understanding of the requirements of engineering documentation.</p> <p>Outline Syllabus: The syllabus includes:</p> <p>Revision of d.c, a.c. and transient circuit analysis.</p> <p>Three phase circuit analysis - star and delta configurations, real and reactive power, power requirement in three phase systems.</p> <p>Power factor correction in single phase and three phase systems via reactive power compensation.</p>

STUDENT AND ACADEMIC SERVICES

Electromagnetic fields and devices, Faraday's Law, Lenz's Law, Ampere's Law, flux, mmf, energy stored in magnetic field, the magnetic circuit, BH characteristics including hysteresis and Harmonic distortion.

Operation of single and three phase transformers, equivalent circuit, referred values, saturation, open and short circuit tests, efficiency, and power factor.

Representation and interconnection of the components such as generators, transformers, transmission lines, circuit breakers and loads found in a.c. electrical power systems.

Principles of operation of dc machines, generating and motoring modes, analysis of electric circuit diagram of dc machines, types of dc machines, speed characteristics of dc machines, speed control of dc machines, voltage regulation, applications of dc machines.

Principles of operation of ac machines, generating and motoring modes, analysis of electric circuit diagram of ac machines, types of ac machines, speed characteristics of ac machines, speed control of ac machines, voltage regulation, applications of ac machines.

Principles of operation of stepper motors, analysis of electric circuit diagram of stepper motors, modern speed control of stepper motors, applications of stepper motors.

Principles of operation of brushless dc motors, analysis of electric circuit diagram of brushless dc motors, microprocessor based speed control of brushless dc motors, applications of brushless dc motors.

Principles of operation of linear motors, analysis of electric circuit diagram of linear motors, speed control of linear motors, applications of linear motors.

Teaching and Learning Methods: The module delivers material on the principles and operation of electrical technology. Concepts and the scope of a topic will be introduced in lectures. These will be supported by tutorials and directed reading and laboratory based work. Tutorial exercises will provide students confidence in applying the concepts and analysing and designing the simple electrical technology circuits. The lab sessions will enhance the understanding of students of real-world applications of the material delivered in the module. The students will learn through applying a variety of analysis methods and mathematical tools to electrical and magnetic circuits. Relevant ethical issues will be highlighted and students will be encouraged to consider these further through directed reading.

Contact Hours:

Activity:

Contact: 72 hours

Assimilation and skill development: 132 hours

Undertaking Coursework: 48 hours

Exam preparation: 48 hours

Total: 300 hours

Part 3: Assessment

Summative assessment is composed of 2 examinations, an open book laboratory test to ensure that the student shows competence in the practical and design aspects of the module and a formal examination to assess understanding of the theoretical underpinning of Electrical Technology.

Formative assessment will be provided throughout the module through verbal feedback during laboratory sessions and through inclass exercises.

STUDENT AND ACADEMIC SERVICES

First Sit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	75 %	Examination (3 hours) (final assessment)
Examination - Component A		25 %	Open book laboratory exam (1 hour)
Resit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	100 %	Examination (3 hours)

Part 4: Teaching and Learning Methods																	
Learning Outcomes	<p>On successful completion of this module students will achieve the following learning outcomes:</p> <table border="1"> <thead> <tr> <th>Module Learning Outcomes</th> <th>Reference</th> </tr> </thead> <tbody> <tr> <td>Demonstrate an understanding of Circuit theory for the steady-state and transient solution of direct current, single-phase ac and symmetrical and asymmetrical polyphase circuits</td> <td>MO1</td> </tr> <tr> <td>Appreciate the characteristics, properties and applications of materials applicable to electrical engineering equipment and manufacturing</td> <td>MO2</td> </tr> <tr> <td>Understand the representation and design of power conversion and drive systems</td> <td>MO3</td> </tr> <tr> <td>Comprehend the application of the above concepts to the design, application and utilization of electrical equipment with an emphasis on a systems approach to real world problems and applications</td> <td>MO4</td> </tr> </tbody> </table>	Module Learning Outcomes	Reference	Demonstrate an understanding of Circuit theory for the steady-state and transient solution of direct current, single-phase ac and symmetrical and asymmetrical polyphase circuits	MO1	Appreciate the characteristics, properties and applications of materials applicable to electrical engineering equipment and manufacturing	MO2	Understand the representation and design of power conversion and drive systems	MO3	Comprehend the application of the above concepts to the design, application and utilization of electrical equipment with an emphasis on a systems approach to real world problems and applications	MO4						
Module Learning Outcomes	Reference																
Demonstrate an understanding of Circuit theory for the steady-state and transient solution of direct current, single-phase ac and symmetrical and asymmetrical polyphase circuits	MO1																
Appreciate the characteristics, properties and applications of materials applicable to electrical engineering equipment and manufacturing	MO2																
Understand the representation and design of power conversion and drive systems	MO3																
Comprehend the application of the above concepts to the design, application and utilization of electrical equipment with an emphasis on a systems approach to real world problems and applications	MO4																
Contact Hours	<table border="1"> <thead> <tr> <th colspan="2">Independent Study Hours:</th> </tr> </thead> <tbody> <tr> <td>Independent study/self-guided study</td> <td>228</td> </tr> <tr> <td>Total Independent Study Hours:</td> <td>228</td> </tr> <tr> <th colspan="2">Scheduled Learning and Teaching Hours:</th> </tr> <tr> <td>Face-to-face learning</td> <td>72</td> </tr> <tr> <td>Total Scheduled Learning and Teaching Hours:</td> <td>72</td> </tr> <tr> <td>Hours to be allocated</td> <td>300</td> </tr> <tr> <td>Allocated Hours</td> <td>300</td> </tr> </tbody> </table>	Independent Study Hours:		Independent study/self-guided study	228	Total Independent Study Hours:	228	Scheduled Learning and Teaching Hours:		Face-to-face learning	72	Total Scheduled Learning and Teaching Hours:	72	Hours to be allocated	300	Allocated Hours	300
Independent Study Hours:																	
Independent study/self-guided study	228																
Total Independent Study Hours:	228																
Scheduled Learning and Teaching Hours:																	
Face-to-face learning	72																
Total Scheduled Learning and Teaching Hours:	72																
Hours to be allocated	300																
Allocated Hours	300																
Reading List	<p>The reading list for this module can be accessed via the following link:</p> <p>https://uwe.rl.talis.com/index.html</p>																

STUDENT AND ACADEMIC SERVICES

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Mechatronics [Sep][PT][BTC][3yrs] FdSc 2018-19

Mechatronics [Sep][PT][GlosColl][3yrs] FdSc 2018-19

Electrical and Electronic Engineering [Sep][SW][Northshore][5yrs] MEng 2018-19

Electrical and Electronic Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19