MODULE SPECIFICATION

Part 1: Information			
Module Title	Electrical Technology		
Module Code	UFMFQ8-30-2	Level	Level 5
For implementation from	2018-19		
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		
Contributes towards			
Module type:	Standard		
Pre-requisites	Engineering Mathematics 2018-19		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
Educational Aims: In addition to the learing outcomes the educational experience may explore, develop, and practise but not formally discretely assess the following: Handling simulation software such as PSCAD, ATPDraw and MATLAB. Familiarity in obtaining, searching and interpreting technical literature and other documentation from various sources. An understanding of the requirements of engineering documentation. **Outline Syllabus:** The syllabus includes: Revision of d.c, a.c. and transient circuit analysis.

Three phase circuit analysis - star and delta configurations, real and reactive power, power requirement in three phase systems.

Power factor correction in single phase and three phase systems via reactive power compensation.

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.			
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

On successful completion of this module students will be able to:

	Module Learning Outcomes
MO1	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
MO2	Appreciate the characteristics, properties and applications of materials applicable to electrical engineering equipment and manufacturing
MO3	Understand the representation and design of power conversion and drive systems
MO4	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

Contact Hours

Contact Hours	
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	*The reading list for this module can be accessed via the following link:* https://uwe.rl.talis.com/index.html	