MODULE SPECIFICATION

Part 1: Information			
Module Title	Power Systems Fundamentals		
Module Code	UFMFRJ-15-2	Level	Level 5
For implementation from	2019-20		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Educational Aims: In addition to the learning outcomes the educational experience may develop through practise but not formally assess the handling of simulation software such as PSCAD, ATPDraw and MATLAB.

Outline Syllabus: The syllabus includes:

History of power systems and symbols used to represent each element.

Structure of modern power systems and their respective ratings.

Per unit systems –single and three phase systems.

One-line diagram representation of power systems elements and components.

Conversion of a network impedance diagram into per unit diagram.

Model of transmission lines/cables, transformers, generators, and loads.

Teaching and Learning Methods: Concepts and the scope of a topic will be introduced in lectures. These will be supported by tutorials, directed reading and laboratory based work.

Tutorial exercises will provide students confidence in applying the concepts and analysing a simple power network. The lab sessions will enhance understanding of realworld applications of the material delivered in the module. The students will learn through applying a variety of analysis methods and mathematical tools to the electrical networks.

Relevant ethical issues will be highlighted and students will be encouraged to consider these further through directed reading.

In addition to 36 hours of scheduled contact, students will be expected to spend (typically) 114 hours in independent study, preparation for classes, assimilation of knowledge and skills development and completion of assessments.

Scheduled learning includes lectures, tutorials and workshops.

Independent learning includes hours engaged with essential reading, assignment preparation and completion, etc. These sessions constitute an average time per level.

Contact Hours:

Scheduled contact = 36 hours

Scheduled contact will take the form of lectures, problems classes and workshops

Part 3: Assessment

The assessment consists of an end of module examination and an assignment.

The strategy has been chosen to ensure that fundamental engineering principles are assessed under controlled conditions, while a more open ended research based assignment is used to encourage wider engagement and reflection on this topic.

The assignment is develops understanding of the design of power systems and their applications. Starting with various design scenarios involving different applications, students are required to analyse, simulate and reflect on these designs and propose ideas for improvements. The assignment therefore develops subject knowledge as well as subject skills such as critical evaluation.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		50 %	Report
Examination - Component A	✓	50 %	Examination (3 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		50 %	Report
Examination - Component A	✓	50 %	Examination (3 hours)

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	Reference
Demonstrate power systems history and symbols used to represent various elements	MO1
Understand global structure of power systems	MO2
Gain knowledge of power systems components and their respective ratings	MO3
Describe a network impedance diagram into per unit diagram	MO4
Implement power injection concept to networks with respect to the changes in voltage magnitude and phase angle	MO5
Design and model transmission lines (short, medium and long), cables, transformers, generators, and loads	MO6

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Face-to-face learning	36
Total Scheduled Learning and Teaching Hours:	36
Hours to be allocated	150
Allocated Hours	150

Reading List

The reading list for this module can be accessed via the following link:

https://uwe.rl.talis.com/index.html

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

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

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