MODULE SPECIFICATION

Part 1: Information			
Module Title	Applied Algebra and Geometry		
Module Code	UFMFWG-15-3	Level	Level 6
For implementation from	2018-19		
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		
Contributes towards			
Module type:	Standard		
Pre-requisites	Algebra, Combinatorics and Graphs 2018-19		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: Algebra and Geometry are two core themes of Mathematics. Their mutual interaction helps to unify Mathematics, and it provides the framework for solving many problems both within Mathematics itself and also in a wide variety of applications.

Educational Aims: This module is intended to give the student a clear indication as to the importance of Algebra and Geometry and their place within Mathematics, and also to discuss some interesting applications. The module builds on the student's knowledge of the following areas: logic and sets; number systems; abstract algebra, including linear algebra and group theory; graph theory. The module serves as an endpoint within the Mathematics degree programme in which several key threads are brought together and in which important links are made with other areas of study.

Outline Syllabus: 1. Introduction: an overview of the geography of Mathematics, in particular the key rôles played by Algebra and by Geometry.

2. Further Group Theory: groups and geometry; conjugation; automorphism groups; factor groups; basic structure theorems; the classification of groups of small order.

3. Quaternions and Octonions: the construction of number systems; the algebra, geometry and applications of the quaternions; an introduction to the octonions

Teaching and Learning Methods: Scheduled contact includes classical lectures and multi-purpose workshops. The latter serve partly to resolve issues brought up by the students on a week-by-week basis, and also to provide an arena for other learning activities appropriate to developing theory or to exploring applications.

Self-study includes: engaging with the resources provided; working on example sheets; locating and utilising other materials to support learning.

Activity (Hours)
Contact (36)
Assimilation and skill development (54)
Coursework (15)
Exam preparation (45)
Total (150)

Part 3: Assessment

Component A. An examination that assesses the student's understanding of concepts and techniques, and also their ability to apply these in relatively straightforward problems.

Component B. A piece of coursework that consists of questions of a more extended nature that require careful thought and the use of appropriate resources. This coursework might develop material, including applications, that has not been explicitly discussed in the module lectures.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Written Assignment - Component B		25 %	Coursework
Examination - Component A	✓	75 %	Examination (2 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Written Assignment - Component B		25 %	Coursework
Examination - Component A	✓	75 %	Examination (2 hours)

Part 4: Teaching and Learning Methods

Learning Outcomes

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

	Module Learning Outcomes
MO1	To define mathematical concepts, to state theorems precisely, and to construct mathematical proofs at a level appropriate to the final year of a Mathematics honours degree
MO2	To perform computations and to derive results within the framework of the areas of algebra and of geometry in the syllabus
MO3	To communicate the results of their work effectively using correct language, notation and style
MO4	To select and to implement appropriate techniques to solve problems arising from within the areas of application studied in the module
MO5	To locate and to utilise their own resources in directed and undirected study

Contact Hours

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/modules/ufmfwg-15-3.html