Liverpool John Moores University

Title:	NUMBER THEORY AND ALGEBRA 1
Status:	Definitive
Code:	**5117EDSTUD** (117575)
Version Start Date:	01-08-2018
Owning School/Faculty:	Education
Teaching School/Faculty:	Education

Team	Leader
Marcus Hill	Y

Academic Level:	FHEQ5	**Credit Value:**	24	**Total Delivered Hours:**	50
Total Learning Hours:	240	**Private Study:**	190		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	30
Online	8
Workshop	10

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Portfolio	Problems	Set of problems and proofs	50	
Exam	Exam	Final exam	50	2

Aims

To introduce basic number theory, using conjectures, theorems, proofs and applications. The module will introduce and illustrate different methods of proof in the context of elementary number theory and illustrate their use in other areas of mathematics.

Learning Outcomes

After completing the module the student should be able to:

1 Select and use appropriate mathematical techniques to the solution problems drawn from the field of number theory in unseen contexts
2 Apply number theory to solve a number of practical problems
3 Use appropriate techniques to construct rigorous mathematical proofs.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Selection of NT problems	2	3
Terminal assessment	1	

Outline Syllabus

The real number line and the Archimedean principle
Proof by induction and some of its uses
Divisibility, least common multiples, and Euclid's algorithm.
Prime numbers and prime-power factorisations and their use in codes
Existence of infinitely many primes and other examples of proof by contradiction.
Modular arithmetic, linear congruences and the Chinese Remainder Theorem.
Fermat's Theorems.
Introduction to sets and their algebra linking to basic probability theory

Learning Activities

Mathematical concepts will be explored in of interactive lectures and workshops backed up by tasks for independent learning. These will use a mix of media e.g. web-based materials including video tutorials and on-line practice exercises, practical activities using ICT as well as more traditional text-book approaches.

Notes

Optional course for Mathematics and Education Studies