

Liverpool John Moores University

Title: SET THEORY AND LOGIC
Status: Definitive
Code: **6117EDSTUD** (117579)
Version Start Date: 01-08-2018

Owning School/Faculty: Education
Teaching School/Faculty: Education

Team	Leader
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Academic Level: FHEQ6 **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	36
Workshop	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Portfolio	ST Proofs	Collection of set theory problems and proofs	25	
Exam	Exam	Terminal exam	50	2
Portfolio	L Proofs	Collection of logic problems and proofs	25	

Aims

To understand and be able to apply independently in novel situations the basic ideas of axiomatic set theory, propositional and predicate logic. To appreciate these fields as foundations of 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 axiomatic set theory in unseen contexts
- 2 Select and use appropriate mathematical techniques to the solution problems drawn from the field of symbolic logic in unseen contexts
- 3 Apply axiomatic set theory to the construction of valid proofs
- 4 Apply symbolic logic to the construction of valid proofs

Learning Outcomes of Assessments

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

Set theory proofs	1	
Terminal assessment	3	4
Logic proofs	2	

Outline Syllabus

Basic set theory

Paradoxes

The size of sets, Power sets and Cantor's proofs and their connections to Number Theory

Zermelo-Fraenkel axioms

Syllogisms and proof

Boolean algebra and its connections to set theory

Constructing an adequate language for propositional logic

Formal proofs and how these link to proofs in "real" mathematics

Correctness, completeness and compactness theorems

Predicate logic – building a language

Proofs in predicate logic

Learning Activities

Lectures, workshops and independent learning activities

Notes

Optional course for Mathematics and Education Studies