MODULE **DESCRIPTOR**

MODULE TITLE	Discrete Mathematics		
MODULE CODE	MA1611 (L4)	CREDIT VALUE	20 Credits (10 ECTS)
SCHOOL	SCHOOL OF SCIENCE		

MODULE **AIMS**

The aims of the module are to develop the student's understanding of logic and basic set theory and apply them to problems in discrete mathematics

MODULE **CONTENT**

Set Theory: Operations, relations, partitions, and functions; Countable and uncountable.

Logic and Boolean Algebra: Propositional logic; Truth tables; Predicates and quantifiers; Proof; Logic gates; Karnaugh Maps.

Graphs and Trees: Representation; Properties; Types of path; Planar graphs; Spanning trees.

Counting: Pigeonhole principle; generalizations of permutations and combinations, inclusion and exclusion principle.

Number representation: Various representations and conversions between these.

INTENDED **LEARNING OUTCOMES**

On successful completion of this module a student will be able to:

1. Prove logical equivalence of statements using propositional logic

2. Prove properties about sets and functions

3. Use algorithms to solve problems about graphs

4. Use algorithms to solve problems about trees

5. Simplify circuits using Boolean algebra

TEACHING METHODS

The class contact will consist of teaching classes together with workshops. Teaching classes will introduce new material and provide examples. Workshops have no new material introduced. Students will attempt problems during the workshops. Key elements of the learning strategy are regular sessions during which problems are attempted. Throughout the week students will be given a list of problems to attempt. Every two weeks there will be a short test on the recent material covered.

The module will be assessed principally by examination. However, to facilitate and monitor the formative learning process selected set exercises will be submitted for assessment. These will present regular opportunities for feedback and feedforward. At the end of the module, students will be expected to include a reflective component in this portfolio of work. This will make up the coursework component of the module.

ASSESSMENT METHODS

This module is assessed through a Portfolio of set exercises (30%) and an examination (70%).