

Module Title	Foundations 1	School	Mathematical & Computer Sciences				On or Off-Campus	On	
Module Co-ordinator		SCQF Level	9	Module Code	F29FA	Semester	1	Credits	15

1. Pre-requisites	None		
2. Linked Modules (specify if synoptic)	F29FB Foundations 2		
3. Excluded Modules	None		
4. Replacement Module	Code:	5. Availability as an Elective	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	Date Of Replacement:		
6. Degrees for which this is a core module	Mandatory module for BSc Computer Science & MEng Software Engineering		
7. Aims			
	<ul style="list-style-type: none"> ◆ To give an introduction to and an appreciation of the basic principles and techniques of logic and proof fundamental to Computer Science. ◆ Introduce the λ-calculus, how computable functions are represented in the λ-calculus, basic theoretical properties of the λ-calculus, and the relevance of the λ-calculus to computer science. 		
8. Syllabus			
	<ul style="list-style-type: none"> ◆ Logic & proof: propositional calculus – truth tables, predicate calculus, inference rules, soundness, completeness, validity, satisfiability, reasoning and calculating with propositions. ◆ Lambda calculus: syntax, notation, bound & free variables and α-conversion and substitution, reduction and computation, representing computable functions, theoretical properties. 		

Module Title	Foundations 1	School	Mathematical & Computer Sciences				On or Off-Campus	On	
Module Co-ordinator		SCQF Level	9	Module Code	F29FA	Semester	1	Credits	15

9. Learning Outcomes (HWU Core Skills: Employability and Professional Career Readiness)

Subject Mastery	<p>Understanding, Knowledge and Cognitive Skills Scholarship, Enquiry and Research (Research-Informed Learning)</p> <ul style="list-style-type: none"> ◆ To demonstrate an understanding of the principles of propositional and predicate calculus. ◆ To foresee the role of argument in logical reasoning. ◆ Practice in formulating and proving arguments using formal logic ◆ Knowledge of lambda calculus ◆ Understanding of different variable techniques (de Bruijn indices, combinator variables) ◆ Understanding of variable binding and capture-free substitution ◆ Knowledge of how to represent computations in the λ-calculus
Personal Abilities	<p>Industrial, Commercial & Professional Practice Autonomy, Accountability & Working with Others Communication, Numeracy & ICT</p> <ul style="list-style-type: none"> ◆ To be able to formulate statements as well formed formulae in propositional and predicate calculus. ◆ To be able to express arguments/problems in propositional and predicate calculus. ◆ To be able to construct formal proofs of logical arguments. ◆ To be able to think about the meaning of programs mathematically

10. Assessment Methods

11. Re-assessment Methods

Method	Duration of Exam (if applicable)	Weighting (%)	Synoptic modules?	Method	Duration of Exam (if applicable)
Exam	2 hours	70%		Exam	2 hours
Coursework		30%			

12. Date and Version

Date of Proposal	June 2009	Date of Approval by School Committee		Date of Implementation	September 2009	Version Number	1.1
-------------------------	-----------	---	--	-------------------------------	----------------	-----------------------	-----