Field	Subfield	Detail
Specialisation Code		COMPTH
Specialisation Name		Theory
Specialisation Type		Honours Specialisation
Career		Undergraduate
Owning Faculty		Faculty of Engineering
Owning Academic Unit		School of Computer Science and Engineering
Collaboring Academic Unit		
Total Units of Credit		144
Specialisation Description for Handbook		In a rapidly evolving world of information technology, computational theory is more important than ever. In this specialisation, you will study the most challenging problems in computational science, gain a deep understanding of the principles underpinning secure and verifiable software, and explore the boundaries of what is possible in computing. Graduates of this specialisation will be well prepared to undertake research in formal verification, algorithms and decision theory, advanced logical modelling, and more. Graduates will be in a position to make serious contributions to research and practice at the edge of computer science today.
Field of Education (Broad)		020000 Information Technology
Field of Education (Narrow)		020100 Computer Science
Field of Education (Detailed)		020105 Computational Theory
Additional Area of Interest Categories		
Learning Outcomes	SLO1	Explain the relevance of abstract methods to concrete issues in computer science.
	SLO2	Apply formal reasoning and analysis to demonstrate the correctness of computational architectures.
	SLO3	Consolidate and leverage theoretical knowledge for innovative research contributions.
	SLO4	Engage with leading research and analysis at both the foundation and edge of computation.
	SLO5	Design and evaluate complex solutions-focussed digital systems.
	SLO6	Synthesise whole-of-discipline understanding to inform technical practice.
	SLO7	Apply advanced logico-mathematical techniques across a broad set of industry-specific applications.
SLO Mapping		TODO
Describe Academic Rules for Codification		Students must complete 144 units of credit
	Core Courses 66 Units of Credit	COMP1511 Programming Fundamentals COMP1521 Computer Systems Fundamentals COMP1531 Software Engineering Fundamentals COMP2521 Data Structures and Algorithms COMP2511 Software Design and Architecture COMP3821 Extended Algorithm Design and Analysis COMP3900 Computer Science Project COMP4920 Professional Issues and Ethics in Information Technology MATH1081 Discrete Mathematics MATH1141 Higher Mathematics 1A MATH1241 Higher Mathematics 1B
	Theory Core Course 6 Units of Credit	COMP2111 Foundations of Formal Methods
	Computing Electives 24 Units of Credit	ENGG2600, ENGG4600, ENGG6600 Engineering VIP any level 3 Computer Science course any level 4 Computer Science course any level 6 Computer Science course any level 9 Computer Science course
	Advanced Computing Electives 12 Units of Credit	any level 4 Computer Science course any level 6 Computer Science course any level 9 Computer Science course
	Thesis 18 Units of Credit	COMP4961 Computer Science Thesis A COMP4962 Computer Science Thesis B COMP4963 Computer Science Thesis C

	Theory Electives 18 Units of Credit (included in the Computing Electives or Advanced Computing Electives)	COMP3153 Algorithmic Verification
		COMP3161 Concepts of Programming Languages
		COMP6453 Applied Cryptography
		COMP4141 Theory of Computation
		COMP4161 Advanced Topics in Software Verification
		COMP4418 Knowledge Representation and Reasoning
		COMP3141 Software Systems Design and Implementation
		COMP3151 Foundations of Concurrency
		COMP4121 Advanced Algorithms
		COMP6451 Cryptocurrency and Distributed Ledger Technologies
		COMP6741 Algorithms for Intractable Problems
	With permission from the Director of Studies, one of the following courses may be substituted as a Theory Elective	MATH5425 Graph Theory
		MATH5505 Combinatorics
		MATH5515 Special Topics in Pure Mathematics A
		MATH5525 Special Topics in Pure Mathematics B
		MATH5535 Special Topics in Pure Mathematics C
	Students must complete a minimum 30 UOC of COMP4***, COMP6***, or COMP9*** undergraduate courses towards Theory Electives and/or Advanced	
Structure Summary (HB)		Students must complete 144 UOC.
Structured Academic Rules (HB)		as in description above
Specialisation Constraints (HB)		
Third Party		
Key Search Terms		Computer, Computer Science, theory, theoretical computer science, verification, algorithms, formal methods, blockchain, cryptography
Additional Information for Handbook		
Publication Flag		Yes
Accepting New Enrolments		Yes