Structure of Postgraduate Programs (2005)

Computing and Information Technology

Entry Point 1: Graduate Certificate in Computing (NEW)

Program 7342 *GradCert*

24 units of credit (4 courses)	24uc (4 courses) over 1 or 2 semesters Minimum 12uc from Group B or C or D Maximum 12uc from Group A

COMPAS7342

Graduate Certificate in Computing students take 4 courses. The following courses are suitable:

COMP9020(A)	Foundations of Computer Science	COMP9041(A)	Software Construction
COMP9021(A)	Principles of Programming	COMP9311(B)	Database Systems
COMP9022(A)	Digital System Structures	COMP9331(C)	Computer Networks & Apps
COMP9024(A)	Data Structures and Algorithms	COMP9414(B)	Artificial Intelligence
COMP9031(B)	Internet Programming	COMP9511(C)	Human Computer Interaction

After successful completion of 4 courses students have two options:

- Graduate from the Graduate Certificate; or
- Apply to articulate to the Graduate Diploma in Computing and Information Technology program with credit for the 4 completed courses.

Students intending to articulate to the Graduate Diploma should pay careful attention when selecting their courses to ensure that they align with the program for the major of their preference.

Admission Requirements: At least a 3 year undergraduate degree equivalent to a standard Australian bachelor degree in science or engineering;

OR formal technical work experience in the area of computer science and engineering of more than 5 years.

Applicants for this certificate must have completed some studies in mathematics.

Articulation: Students can apply to articulate from the Graduate Certificate in Computing program 7342 to the Graduate Diploma in Computing and Information Technology program 5432. Full credit will be granted where the student does not take out the GradCert. Where the student chooses to graduate from the Graduate Certificate in Computing they may apply to upgrade to the Graduate Diploma in Computing and Information Technology with credit for 12uc, ie. 50% of the Graduate Certificate program.

Entry Point 2: Graduate Diploma in Computing and Information Technology

Program 5432 *GradDip*

Formerly GradDip programs in Computer Science (GradDip CS 5452) & Information Science (GradDip IS 5453)

72 units of credit (12 courses)	24uc Group A (4 courses) 30uc Group B/C (5 courses) 18uc Group D (3 courses)

The 72uc must include 18uc in a chosen area to satisfy one of the following majors:

COMPAS5432

Autonomous Systems

Autonomous Systems majors are exempt from Group A courses COMP9020 and COMP9022. They are required to replace these with the following courses:

COMP9414	Artificial Intelligence
COMP4411	Experimental Robotics

Autonomous Systems majors must also take at least three courses from the following:

COMP9417	Machine Learning & Data Mining (REVISED)
COMP9444	Neural Networks
COMP4416	Intelligent Agents
COMP9517	Computer Vision (REVISED)
COMP9511	Human Computer Interaction

COMPBS5432

Bioinformatics

Bioinformatics majors are exempt from Group A courses COMP9020 and COMP9022. They are required to replace these with the following courses:

BIOT7160	Genomics & Proteomics
BINF9010	Bioinformatics Methods & Applications (NEW)

Bioinformatics majors must also take at least three courses from the following:

MATH5846	Intro to Probability & Stochastic Processes,
*MATH5856	Intro to Statistics & Statistical Computations
COMP9318	Data Warehousing & Data Mining
COMP9417	Machine Learning & Data Mining

* MATH5846 Has co-requisite of MATH5846. Seek permission from School of Mathematics if you have not completed MATH5846.

COMPCS5432

Computer and Information Technology

A range of Group D courses from the School of CSE – subject to pre-requisites.

COMPES5432

eCommerce Systems

COMP9321	eCommerce Systems Implementation Infrastructure (NEW)
COMP9322	eCommerce Systems Engineering(NEW)
COMP9323	eEnterprise Project (NEW)
GBAT9117	E-Business: Strategy and Management (MBT)
LEGT5421	E-Business and the Law (LEGT)

COMPDS5432

Database Systems

COMP9314	Next Generation Database Systems
COMP9315	Database Systems Implementation
COMP9316	eCommerce Systems Implementation
COMP9318	Data Warehousing and Data Mining (NEW)

COMPIS5432

Internetworking

COMP9331	Computer Networks and Applications
COMP9332	Network Routing and Switching
COMP9333	Advanced Computer Networks
COMP9334	Systems Capacity Planning

COMPKS5432

Knowledge Systems & Data Mining

Knowledge Systems & Data Mining majors are exempt from Group A courses COMP9020 and COMP9022. They are required to replace these with the following courses:

COMP9414	Artificial Intelligence
COMP9311	Database Systems

Knowledge Systems & Data Mining majors must also take at least three courses from the following:

COMP9416	Knowledge Systems (REVISED)
COMP9317	Data Warehousing and Data Mining (NEW)
COMP9417	Machine Learning and Data Mining (REVISED)
COMP4416	Intelligent Agents

After successful completion of 12 courses students have two options:

- Graduate from the Graduate Diploma; or
- Apply to articulate to the Masters program with credit for the 12 completed courses.

Admission Requirements: A 3 year undergraduate degree equivalent to a standard Australian bachelor degree in science or engineering; where a high credit average was achieved over the final 2 years;

OR, a 3 year undergraduate degree equivalent to a standard Australian bachelor degree in a discipline that included Mathematics up to at least year 2 level; where a high credit average was achieved over the final 2 years.

Articulation: Students intending to articulate to the Masters should pay careful attention when selecting their courses to ensure that they align with the program for the major of their preference. It may not be possible to transfer between the Graduate Diploma and Masters programs majors without the completion of extra courses.

Students can apply to articulate from the Graduate Diploma in Computing and Information Technology program 5432 to the Master of Computing and Information Technology program 8682. Full credit will be granted where the student does not take out the award. Where the student chooses to graduate from the Graduate Diploma in Computing and Information Technology they may apply to upgrade to the Masters with credit for 48uc, ie. 50% of the Masters program.

Advanced Standing in up to 4 Group A courses may be possible on completion of a formal exemption exam or other clear evidence of having covered this material previously. This would reduce the length of the program by up to 4 courses.

Advanced Standing is also approved for Group B, C or D courses where the student has already completed a course relevant to this program, and where they have not been awarded the degree. Ie. They have not already received credit for the course towards another completed degree.

Entry Point 3: Masters of Computing and Information Technology

Program 8682 *MCompIT*

Formerly Masters programs in Computer Science (MCompSc 8680) & Information Science (MInfSc 8508)

96 units of credit (16 courses)

24uc Group A (4 courses)
36uc Group B/C (6 courses)
24uc Group D (4 courses), or 12uc Group D courses if undertaking a 12uc project (available in the final semester)
12uc Electives (2 courses) from remaining group A/B/C/D courses

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The 96uc must include 18uc in a chosen area to satisfy one of the following majors:

COMPAS8682

Autonomous Systems

Autonomous Systems majors are exempt from Group A courses COMP9020 and COMP9022. They are required to replace these with the following courses:

COMP9414	Artificial Intelligence
COMP4411	Experimental Robotics

Autonomous Systems majors must also take at least three courses from the following:

COMP9417	Machine Learning & Data Mining (REVISED)
COMP9444	Neural Networks
COMP4416	Intelligent Agents
COMP9517	Computer Vision (REVISED)
COMP9511	Human Computer Interaction

COMPBS8682

Bioinformatics

Bioinformatics majors are exempt from Group A courses COMP9020 and COMP9022. They are required to replace these with the following courses:

BIOT7160	Genomics & Proteomics
BINF9010	Bioinformatics Methods & Applications (NEW)

Bioinformatics majors must also take at least three courses from the following:

MATH5846	Intro to Probability & Stochastic Processes,
*MATH5856	Intro to Statistics & Statistical Computations
COMP9318	Data Warehousing & Data Mining
COMP9417	Machine Learning & Data Mining

* MATH5846 Has co-requisite of MATH5846. Seek permission from School of Mathematics if you have not completed MATH5846.

COMPCS8682

Computer and Information Technology

A range of Group D courses from the School of CSE – subject to pre-requisites.

COMPES8682

eCommerce Systems

COMP9321	eCommerce Systems Implementation Infrastructure (NEW)
COMP9322	eCommerce Systems Engineering (NEW)
COMP9323	eEnterprise Project (NEW)
GBAT9117	E-Business: Strategy and Management (MBT)
LEGT5421	E-Business and the Law (LEGT)

COMPDS8682

Database Systems

COMP9314	Next Generation Database Systems
COMP9315	Database Systems Implementation
COMP9316	eCommerce Systems Implementation
COMP9318	Data Warehousing and Data Mining (NEW)

COMPIS8682

Internetworking

COMP9331	Computer Networks and Applications
COMP9332	Network Routing and Switching
COMP9333	Advanced Computer Networks
COMP9334	Systems Capacity Planning

COMPKS8682

Knowledge Systems & Data Mining

Knowledge Systems & Data Mining majors are exempt from Group A courses COMP9020 and COMP9022. They are required to replace these with the following courses:

COMP9414	Artificial Intelligence
COMP9311	Database Systems

Knowledge Systems & Data Mining majors must also take at least three courses from the following:

COMP9416	Knowledge Systems (REVISED)
COMP9317	Data Warehousing and Data Mining (NEW)
COMP9417	Machine Learning and Data Mining (REVISED)
COMP4416	Intelligent Agents

Admission Requirements: A 4 year undergraduate degree equivalent to a standard Australian bachelor degree in science or engineering, where a high credit average was achieved over the final 2 years;

OR, a 4 year undergraduate degree equivalent to a standard Australian bachelor degree in a discipline that included Mathematics up to at least year 2 level; where a high credit average was achieved over the final 2 years.

Articulation: Students can apply to articulate from the Graduate Diploma in Computing and Information Technology program 5432 to the Master of Computing and Information Technology program 8682. Full credit will be granted where the student does not take out the award. Where the student chooses to graduate from the Graduate Diploma in Computing and Information Technology they may apply to upgrade to the Masters with credit for 48uc, ie. 50% of the Masters program.

Advanced Standing in up to 4 Group A courses may be possible on completion of a formal exemption exam or other clear evidence of having covered this material previously. This would reduce the length of the program by up to 4 courses.

Advanced Standing is also approved for Group B, C or D courses where the student has already completed a course relevant to this program, and where they have not been awarded the degree. Ie. They have not already received credit for the course towards another completed degree.

Information Technology

Entry Point 1: Graduate Certificate in Advanced Computing (NEW)

Program 7344 *GradCert*

24 units of credit (4 courses)	24uc (4 courses) over 1 or 2 semesters Excludes all Group A courses A maximum of 2 Group B or C courses permitted A minimum of 2 Group D courses

COMPAS7344

Graduate Certificate in Advanced Computing students take 4 courses with the above restrictions – subject to pre-requisites.

After successful completion of 4 courses students have two options:

- Graduate from the Graduate Certificate; or
- Apply to articulate to the Masters program with credit for the 4 completed courses.

Students intending to articulate to the Masters should pay careful attention when selecting their courses to ensure that they align with the program for the major of their preference.

Admission Requirements: At least a 3 year undergraduate degree equivalent to a standard Australian bachelor degree in computing, where a high credit average was achieved over the final 2 years;

OR formal technical work experience in the area of computer science and engineering of more than 5 years.

Applicants for this certificate must have completed studies in a broad range of computing areas, including programming in at least 2 high level languages and assembly language, data structures and algorithms, and a range of intermediate level (ie. 3rd year) courses from areas such as computer architecture, operating systems, software engineering, databases, networks and artificial intelligence.

Articulation: Students can apply to articulate from the Graduate Certificate in Advanced Computing program 7344 to the Master of Information Technology program 8684. Full credit will be granted where the student does not take out the award. Where the student chooses to graduate from the Graduate Certificate in Advanced Computing they may apply to upgrade to the Master of Information Technology with credit for 12uc, ie. 50% of the Graduate Certificate program.

Entry Point 2: Masters of Information Technology

Program 8684 *MIT*

Formerly Masters of Engineering Science program (8685)

48 units of credit

Excludes all Group A courses

No more than 18uc (3 courses) from Group B or C
Up to 1 free elective (non-advanced UNSW postgraduate elective)
Up to 1 Group D course can be substituted by a non-CSE course.

The 48uc must include 18uc in a chosen area to satisfy one of the following majors:

COMPAS8684

Autonomous Systems

Autonomous Systems majors are required to take the following courses:

COMP9414	Artificial Intelligence
COMP4411	Experimental Robotics

Where a course equivalent to COMP9414 has been completed as part of an undergraduate degree, students may replace this course with a Group B, C, or D elective.

Autonomous Systems majors must also take at least three courses from the following:

COMP9417	Machine Learning & Data Mining (REVISED)
COMP9444	Neural Networks
COMP4416	Intelligent Agents
COMP9517	Computer Vision (REVISED)
COMP9511	Human Computer Interaction

COMPBS8684

Bioinformatics

Bioinformatics majors are required to take the following courses:

BIOT7160	Genomics & Proteomics
BINF9010	Bioinformatics Methods & Applications (NEW)

Bioinformatics majors must also take at least one courses from the following:

MATH5846	Intro to Probability & Stochastic Processes,
*MATH5856	Intro to Statistics & Statistical Computations
COMP9318	Data Warehousing & Data Mining
COMP9417	Machine Learning & Data Mining

* MATH5846 Has co-requisite of MATH5846. Seek permission from School of Mathematics if you have not completed MATH5846.

COMPCS8684

Information Technology

A range of Group D courses from the School of CSE – subject to pre-requisites.

COMPES8684

eCommerce Systems

COMP9321	eCommerce Systems Implementation Infrastructure (NEW)
COMP9322	eCommerce Systems Engineering (NEW)
COMP9323	eEnterprise Project (NEW)
GBAT9117	E-Business: Strategy and Management (MBT)
LEGT5421	E-Business and the Law (LEGT)

COMPDS8684

Database Systems

COMP9314	Next Generation Database Systems
COMP9315	Database Systems Implementation
COMP9316	eCommerce Systems Implementation
COMP9318	Data Warehousing and Data Mining (NEW)

COMPIS8684

Internetworking	
COMP9331	Computer Networks and Applications
COMP9332	Network Routing and Switching
COMP9333	Advanced Computer Networks
COMP9334	Systems Capacity Planning

COMPKS8684

Knowledge Systems & Data Mining

Knowledge Systems & Data Mining majors are required to take the following courses:

COMP9414	Artificial Intelligence
COMP9311	Database Systems

Where courses equivalent to COMP9414 and COMP9311 have been completed as part of an undergraduate degree, students may replace these courses with Group B, C, or D electives.

Knowledge Systems & Data Mining majors must also take at least three courses from the following:

COMP9416	Knowledge Systems (REVISED)
COMP9317	Data Warehousing and Data Mining (NEW)
COMP9417	Machine Learning and Data Mining (REVISED)
COMP4416	Intelligent Agents

Admission Requirements: EITHER a 4 year undergraduate degree equivalent to a standard Australian bachelor degree in computing, where a high credit average was achieved over the final 2 years;

OR a 3 year undergraduate degree equivalent to a standard Australian bachelor degree in computing, with a high credit average over the final 2 years, AND formal technical work experience in the area of computer science and engineering of more than 1 year.

OR a 3 year undergraduate degree equivalent to a standard Australian bachelor degree in computing, with a high credit average over the final 2 years, AND completion of the Graduate Certificate in Advanced Computing.

Applicants for this degree must have completed studies in a broad range of computing areas, including programming in at least 2 high level languages and assembly language, data structures and algorithms, and a range of intermediate level (ie. 3rd year) courses from areas such as computer architecture, operating systems, software engineering, databases, networks and artificial intelligence.

Articulation: Students can apply to articulate from the Graduate Certificate in Advanced Computing program 7344 to the Master of Information Technology. Full credit will be granted where the student does not take out the award. Where the student chooses to graduate from the Graduate Certificate in Advanced Computing they may apply to upgrade to the Master of Information Technology with credit for 12uc, ie. 50% of the Graduate Certificate program.

Advanced Standing is approved where the student has already completed a course relevant to this program, and where they have not been awarded the degree. Eg. They have not already received credit for the course towards another degree.

Course Groups and Elective Courses

Postgraduate courses in the School of Computer Science and Engineering are classified into four groups.

GROUP A - INTRODUCTORY COURSES

Group A CORE consists of bridging material in computing taught at an accelerated pace for MCIT and GradDipCIT students. Students who are able to demonstrate that they have thoroughly covered equivalent material in their previous studies may request exemptions from some or all of these courses. These courses are not available in MIT for credit.

COMP9020 - Foundations of Computer Science
COMP9021 - Principles of Programming
COMP9022 - Digital System Structure
COMP9024 - Data Structures and Algorithms

Group A ELECTIVE
COMP9031 - Internet Programming
COMP9041 – Software Construction Techniques and Tools
COMP9520 – Concrete Computing **(NEW)**

GROUP B and C - CORE COMPUTING

Group B and C courses constitute the core of the IT discipline, and every graduate from a CSE postgraduate program should know about the majority of these topics.

COMP9008 - Software Engineering
COMP9101 - Design & Analysis of Algorithms
COMP9102 - Compiling Techniques
COMP9201 - Operating Systems
COMP9221 - Microprocessor Systems
COMP9311 - Database Systems
COMP9414 - Artificial Intelligence
COMP9161 - Concepts of Programming Languages
COMP9151 - Foundations of Concurrency
COMP9331 - Computer Networks & Applications
COMP9415 - Computer Graphics
COMP9511 - Human Computer Interaction

GROUP D - ADVANCED ELECTIVES

Group D courses are advanced electives that can be used by a student to gain specialisation in one of several areas of computing.

BINF9010 – Bioinformatics Methods & Applications **(NEW)**
COMP4001 - Object-oriented Software Development
COMP4121 - Advanced and Parallel Algorithms
COMP4132 - Advanced Functional Programming
COMP4133 - Advanced Compiler Construction
COMP4141 - Theory of Computation
COMP4211 - Advanced Architectures & Algorithms
COMP4411 - Experimental Robotics
COMP4412 - Introduction to Modal Logic
COMP4415 - Artificial Intelligence: Foundations
COMP4416 - Intelligent Agents
COMP4511 - User Interface Design
COMP9018 - Advanced Graphics
COMP9103 - Algorithms and Computational Complexity
COMP9116 - Software System Dev. Using B
COMP9117 - Architectures of Software Systems
COMP9211 - Computer Architecture
COMP9231 - Integrated Digital Systems
COMP9242 - Advanced Operating Systems
COMP9243 - Distributed Systems
COMP9315 - Database System Implementation
COMP9316 - eCommerce Systems Implementation
COMP9318 – Data Warehousing and Data Mining **(NEW)**
COMP9321 – eCommerce Systems Implementation Infrastructure **(NEW)**
COMP9322 - eCommerce Systems Engineering **(NEW)**
COMP9323 - eEnterprise Project **(NEW)**
COMP9332 - Network Routing & Switching
COMP9333 - Advanced Computer Networks
COMP9334 - Capacity Planning of Computer Systems and Networks
COMP9416 – Knowledge Systems **(REVISED)**
COMP9417 - Machine Learning **(REVISED)**

COMP9441 - Cryptography and Security
COMP9444 - Neural Networks
COMP9517 – Computer Vision
COMP9790 - Principles of GNSS Positioning (offered by GMAT)
COMP9791 - Modern Navigation & Positioning Technologies (offered by GMAT)

NON-CSE ELECTIVES

While it is expected that the majority of courses will be taken from within the school, there is a provision to substitute Group B, C, or D courses with elective courses from other schools at UNSW. Up to 12uc may be substituted in the MIT and GradDipCompIT, and 24uc in the MCompIT.

Approved courses include:

GEOS9012 - Remote Sensing Applications
GMAT9604 - Land Information Systems
IMGT5110 - Information Retrieval Systems
INFS5926 - Advanced Data Management
INFS5927 - Knowledge Based Information Systems
INFS5957 - Information and Decision Technology
INFS5982 - Advanced Data Communications
INFS5984 - Information Systems Security
INFS5985 - Managing Electronic Commerce
INFS5989 - Information Systems Design
INFS5991 - Decision Support Systems
TELE9303 - Network Management

The following courses are available as electives in the Autonomous Systems and Knowledge Systems and Data Mining majors only:

MATH5905 – Statistical Inference
MATH5895 – Non-parametric Methods
MATH5856 – Intro to Statistics and Statistical Computations
MATH5945 – Categorical Data Analysis

The following courses are available as electives in the Bioinformatics major only:

BIOT7160 – Genomics and Proteommics
BIOT7070 – Recombinant Protein Expression
MATH5846 – Intro to Probability and Stochastic Processes
MATH5856 – Intro to Statistics and Statistical Computations

All the elective courses above may replace only Group B or C courses. Additional courses will be considered on a case-by-case basis.

For all other non-cse electives and all Group D substitutions students should seek permission from the School before enrolling.