

Diploma of Computing

Course Outline

Campus	Melbourne Burwood Campus / Jakarta Campus, Indonesia
Intake	March, June, October
CRICOS	022638B
Course Duration	The duration of the Diploma course is three trimesters (12 months). There is an option, however, to fast track the course and complete it in two trimesters (8 months).
Teaching Methods	Instruction for all units is classroom based. Generally, four hours of class contact per week are allocated to each unit. Some units have additional laboratory hours/practical classes.
Assessment	Assessment for all units is ongoing and continuous consisting of tests, assignments and case study analysis. Most units have a final two-hour examination.
Course Structure	Eight units must be completed and passed to be awarded the Diploma.
Units	<p>SIT101 Fundamentals of Information Technology SIT102 Introduction to Programming SIT103 Database and Information Retrieval SIT104 Introduction to Web Development SIT105 Critical Thinking and Problem Solving for IT SIT111 Introduction to Computer Science SIT112 Data Science Concepts (Not available T2 2017)* SIT113 Cloud Computing and Virtualisation SIT120 Introduction to Apps Design SIT151 Game Fundamentals SIT153 Introduction to Game Programming (Not available in T2 2017) SIT161 Principles of Interactive Media SIT162 Interactive Media Systems SIT182 Real World Practices for Cyber Security SIT190 Introductory Mathematical Methods § SIT191 Introduction to Statistics and Data Analysis SIT192 Discrete Mathematics</p> <p>* It is recommended that students take SIT111 Introduction to Computer Science (Python) before undertaking SIT112 Data Science Concepts due to the progression of software knowledge. § SIT190 Introductory Mathematical Methods is a foundation mathematics unit designed to prepare students for tertiary level mathematics. Students who have completed Year 12 Mathematical Methods, Units 3 and 4 (or equivalent) may choose to replace SIT190 with another SIT coded elective.</p>

<p>Transfer to Deakin University</p>	<p>The following transfer criteria apply:</p> <ul style="list-style-type: none">• You must complete and pass eight Deakin College diploma units*.• You must achieve the required Weighted Average Mark (WAM) for your Deakin College diploma taking into account all units attempted at Deakin College (required WAM's are included under each Deakin University degree on the following pages). <p>* Transfer to some degrees requires specific Deakin College units to be completed in order to receive the appropriate credits (see Deakin University degrees below for core units).</p>
---	--

Subject	Trimester 1 2017	Trimester 2 2017	Trimester 3 2017
SIT101 Fundamentals of Information Technology	✓	✓	✓
SIT102 Introduction to Programming	✓	✓	✓
SIT103 Database and Information Retrieval	✓	✓	✓
SIT104 Introduction to Web Development	✓	✓	✓
SIT105 Critical Thinking and Problem Solving for IT	✓	✓	✓
SIT111 Introduction to Computer Science	✓	✓	✓
SIT112 Data Science Concepts	✓	✗	✓
SIT113 Cloud Computing and Virtualisation	✓	✓	✓
SIT120 Introduction to Apps Design	✓	✓	✓
SIT151 Game Fundamentals	✓	✓	✓
SIT153 Introduction to Game Programming	✓	✗	✓
SIT161 Principles of Interactive Media	✓	✓	✓
SIT162 Interactive Media Systems	✓	✓	✓
SIT182 Real World Practices for Cyber Security	✓	✓	✓
SIT190 Introductory Mathematical Methods	✓	✓	✓
SIT191 Introduction to Statistics and Data Analysis	✗	✓	TBC
SIT192 Discrete Mathematics	✓	✓	✓

Diploma of Computing

Example Course Plans for Students

Example Course Plans for Students

The following are a series of example course plans for students studying in the Diploma of Computing. Please note that core and elective units can be taken in any order. The following course plans should be used as a guide only.

How to use the Plans

Students need to select or choose which Deakin University Course they wish to transfer into once they have completed their studies at Deakin College. Deakin University offers direct transfer into the following courses

- Bachelor of Information Technology (S326)
- Bachelor of Computer Science (S306)
- Bachelor of Games Design and Development (S333)
- Bachelor of Cyber Security (S334)

When I transfer to Deakin University I want to study Bachelor of Information Technology (B WP T1 T2)

International Students WAM: **B 50 WP 50**
 Australian Students WAM: **B 50 WP 50 C 50**
 Credits for Transfer: 8

Majors offered at Deakin University include:

- Cloud Computing
- Game Development
- Interactive Media Design
- Mobile and Apps Development
- Programming
- Security
- Virtual and Augmented Reality

Fast Track (Completing In 8 months/2 trimesters)				
1 st Trimester	CORE SIT101 Fundamentals of Information Technology	CORE SIT105 Critical Thinking and Problem Solving	Elective	Elective
2 nd Trimester	CORE SIT104 Introduction to Web Development	CORE SIT103 Database and Information Retrieval	Elective	Elective

Normal Track (Completing course in 12 months/ 3 Trimesters)			
1 st Trimester	CORE SIT101 Fundamentals of Information Technology	CORE SIT105 Critical Thinking and Problem Solving	Elective
2 nd Trimester	CORE SIT104 Introduction to Web Development	CORE SIT103 Database and Information Retrieval	Elective
3 rd Trimester	Elective	Elective	

Electives

Students must complete one of the following majors. Students wishing to major in the following areas must include the following subjects in their electives:

- **Cloud Computing** SIT113 Cloud Computing and Virtualisation and SIT182 Real World Practices for Cyber Security
- **Game Development** – SIT151 Game Fundamentals, SIT153 Introduction to Game Programming (Not available in T2 2017) and SIT190 Introductory Mathematical Methods
- **Interactive Media Design** – SIT161 Principles of Interactive Media and SIT162 Interactive Media Systems
- **Mobile and Apps Development** – SIT102 Introduction to Programming and SIT120 Introduction to Apps Design
- **Programming** – SIT102 Introduction to Programming
- **Security** – SIT182 Real World Practices for Cyber Security and SIT192 Discrete Mathematics
- **Virtual and Augmented Reality** - SIT102 Introduction to Programming

*Additional 1st year units to be taken at Deakin University as part of this major
SIT183 Application and Design of Virtual and Augmented Reality Systems*

Other Electives can include any of the following:

- SIT102 Introduction to Programming (recommend students complete SIT101 & SIT105 before enrolling in SIT102)
- SIT111 Introduction to Computer Science
- SIT112 Data Science Concepts (Not available T2 2017)
- SIT113 Cloud Computing and Virtualisation
- SIT120 Introduction to Apps Design
- SIT151 Game Fundamentals
- SIT153 Introduction to Game Programming (Not available in T2 2017)
- SIT161 Principles of Interactive Media
- SIT162 Interactive Media Systems (recommend students complete SIT161 before enrolling in SIT162)
- SIT182 Real World Practices for Cyber Security
- SIT190 Introductory Mathematical Methods
- SIT191 Introduction to Statistics and Data Analysis
- SIT192 Discrete Mathematics

When I transfer to Deakin University I want to study Bachelor of Computer Science (B T1 T2)

International Students WAM: **B 50**

Australian Students WAM: **B 50**

Credits for Transfer: 8

Majors offered at Deakin University include:

- Data Science
- Cognitive Science
- Robotics and Cyber-physical Computing

Fast Track (Completing In 8 months/2 trimesters)				
1 st Trimester	CORE SIT111 Introduction to Computer Science	CORE SIT105 Critical Thinking and Problem Solving	CORE SIT190 Introductory Mathematical Methods	Restrictive Elective
2 nd Trimester	CORE SIT102 Introduction to Programming	CORE SIT103 Database and Information Retrieval	CORE SIT192 Discrete Mathematics	Restrictive Elective

Normal Track (Completing course in 12 months/ 3 Trimesters)			
1 st Trimester	CORE SIT111 Introduction to Computer Science	CORE SIT105 Critical Thinking and Problem Solving	CORE SIT190 Introductory Mathematical Methods
2 nd Trimester	CORE SIT102 Introduction to Programming	CORE SIT103 Database and Information Retrieval	CORE SIT192 Discrete Mathematics
3 rd Trimester	Restrictive Elective	Restrictive Elective	

Electives

Students must complete the following major. Students wishing to major in the following areas must include the following subjects in their electives:

- **Data Science** – SIT191 Introduction to Statistics and Data Analysis and SIT112 Data Science Concepts (Not available T2 2017)

Other Electives – None

**When I transfer to Deakin University I want to study
Bachelor of Games Design and Development (B T1 T2)**

International Students WAM: **B 50**

Australian Students WAM: **B 50**

Credits for Transfer: 8

Fast Track (Completing In 8 months/2 trimesters)				
1 st Trimester	CORE SIT101 Fundamentals of Information Technology	CORE SIT151 Game Fundamentals	CORE SIT105 Critical Thinking and Problem Solving	CORE SIT190 Introductory Mathematical Methods
2 nd Trimester	CORE SIT104 Introduction to Web Development	CORE SIT103 Database and Information Retrieval	CORE SIT153 Introduction to Game Programming (Not available in T2 2017)	Elective

Normal Track (Completing course in 12 months/ 3 Trimesters)			
1 st Trimester	CORE SIT101 Fundamentals of Information Technology	CORE SIT151 Game Fundamentals	CORE SIT105 Critical Thinking and Problem Solving
2 nd Trimester	CORE SIT190 Introductory Mathematical Methods	CORE SIT104 Introduction to Web Development	CORE SIT103 Database and Information Retrieval
3 rd Trimester	CORE SIT153 Introduction to Game Programming (Not available in T2 2017)	Elective	

Other Electives can include any of the following:

- SIT102 Introduction to Programming (recommend students complete SIT101 & SIT105 before enrolling in SIT102)
- SIT111 Introduction to Computer Science
- SIT112 Data Science Concepts (Not available T2 2017)
- SIT113 Cloud Computing and Virtualisation
- SIT120 Introduction to Apps Design
- SIT161 Principles of Interactive Media
- SIT162 Interactive Media Systems (recommend students complete SIT161 before enrolling in SIT162)
- SIT182 Real World Practices for Cyber Security
- SIT191 Introduction to Statistics and Data Analysis
- SIT192 Discrete Mathematics

**When I transfer to Deakin University I want to study
Bachelor of Cyber Security (B WP T1 T2)**

International Students WAM: **B 50 WP 50**

Australian Students WAM: **B 50 WP 50**

Credits for Transfer: 8

Fast Track (Completing In 8 months/2 trimesters)				
1 st Trimester	CORE SIT101 Fundamentals of Information Technology	CORE SIT105 Critical Thinking and Problem Solving	CORE SIT192 Discrete Mathematics	Elective
2 nd Trimester	CORE SIT103 Database and Information Retrieval	CORE SIT104 Introduction to Web Development	CORE SIT182 Real World Practices for Cyber Security	Elective

Normal Track (Completing course in 12 months/ 3 Trimesters)			
1 st Trimester	CORE SIT101 Fundamentals of Information Technology	CORE SIT105 Critical Thinking and Problem Solving	CORE SIT192 Discrete Mathematics
2 nd Trimester	CORE SIT103 Database and Information Retrieval	CORE SIT104 Introduction to Web Development	CORE SIT182 Real World Practices for Cyber Security
3 rd Trimester	Elective	Elective	

Other Electives can include any of the following:

- SIT102 Introduction to Programming (recommend students complete SIT101 & SIT105 before enrolling in SIT102)
- SIT111 Introduction to Computer Science
- SIT112 Data Science Concepts (Not available T2 2017)
- SIT113 Cloud Computing and Virtualisation
- SIT120 Introduction to Apps Design
- SIT151 Game Fundamentals
- SIT153 Introduction to Game Programming (Not available in T2 2017)
- SIT161 Principles of Interactive Media
- SIT162 Interactive Media Systems (recommend students complete SIT161 before enrolling in SIT162)
- SIT190 Introductory Mathematical Methods
- SIT191 Introduction to Statistics and Data Analysis

Deakin University Campuses and Trimester codes

B Melbourne Burwood Campus **WP** Geelong Waurn Ponds Campus

T1 Trimester 1 entry **T2** Trimester 2 entry

NOTE: for Australian students entry is for T1 only. T2 entry is subject to availability of places.

CRICOS Codes: Bachelor of Information Technology 053993D, Bachelor of Computer Science 083695K, Bachelor of Games Design and Development 083694M, Bachelor of Cyber Security 091336M.

Unit Outlines

PLEASE ENSURE YOU CHECK THE TRIMESTER 2, 2017 UNIT OUTLINE FOR ANY CONTENT AND ASSESSMENT UPDATES

SIT101 Fundamentals of Information Technology

This unit is the foundation unit for all the information technology areas of study. It covers an introduction to the major areas within IT including: hardware, software, communications and networks, system and application programming, system development, programming languages and programming development, security, as well as ethics and privacy. Students will have the opportunity of exploring a number of applications including word processing and spreadsheets in the context of the wider curriculum. Professional skills including time management, study planning, library and communication skills will be emphasised as the foundation to becoming an efficient and effective tertiary student.

Assessment: 20% revision test, 30% two assignments (15% each), 50% final examination.

SIT102 Introduction to Programming

This unit explores the relationship between computer program code and the software systems that are generated from them. Students experience developing simple software in the context of laboratory-based practicals and individual assignment tasks. They explore and use a variety of data types including arrays and structures, and elementary flow control including function calls, alternation and iteration. They examine I/O in which software interacts with simple text files and users via console and GUI components.

Assessment: 50% practical assessments, 50% final examination

SIT103 Database and Information Retrieval

This unit will provide a solid foundation for the design, implementation and management of database systems. Data modelling is introduced, focusing on entity-relationship (ER) modelling. The skills required to construct such ER diagrams will be explored, with a focus on ensuring that the semantics of the model match those of the real-world it is representing. The relational data model will be presented and the functionality it affords will be explored. The process of constructing, maintaining and retrieving information from the database using SQL will be a focus of this unit. Key implementation and management concepts, including transaction management and concurrency control, and database backup and recovery will be investigated. The impact of new technologies on database design, particularly the Internet, will be covered briefly.

Assessment: 40% practical assignments, 60% final examination

SIT104 Introduction to Web Development

This unit introduces the techniques of creating static and dynamic web content using (X) HTML, style sheets, client side and server side scripting languages and databases. It focuses on developing the skills required for web programming with mark-up and scripting languages such as, building quality web pages, designing and maintaining a website. It introduces the concepts and technologies of the Web, the Internet and data networks, addresses how to use basic web programming tools and discusses the potential future of web/internet applications.

Assessment: 40% two assignments, 60% final examination

SIT105 Critical Thinking and Problem Solving

The unit provides students with the opportunity to study critical thinking and problem solving. Students will learn about the different categories of problems; general techniques to solve problems; where problems requiring algorithmic solutions are placed in these categories; and techniques to build and test algorithmic solutions.

Critical thinking skills will be presented through analysing and understanding requirements and specifications. The problem solving section will take students through IT related problems and introduce them to systematic approaches and methods to solve these problems.

Assessment: 20% two quizzes, 40% two assignments, 40% final examination

SIT111 Introduction to Computer Science

This unit is the foundation unit for the Bachelor Computer Science degree. It covers an introduction to the major areas within computer science including: hardware, software, data storage and manipulation, algorithms and their development, program stages (development, compilation, execution, testing and debugging).

Students will explore the role of abstraction in computer science by examining the relationships between programming environments (from low-level assembly through to high level languages) and learning how these programs interact with and operate on the underlying hardware and operating systems they execute on. The professional role that a computer scientist plays in the development of complex computer solutions will be emphasised.

Assessment: 25% practical assessment; 25% project work and portfolio; 50% final examination

SIT112 Data Science Concepts

Data science is an emerging field and data scientists must be able to know how to make sense of data. In SIT112, students will develop knowledge of fundamentals in data science, in particular data manipulation and algorithms for analytics. The unit will also cover the practice of data science including ethical and responsible behaviour when crawling, cleaning, analysing, representing and repurposing the data. Students will be able to obtain data, recognise data formats, summarise and visualise relationships in the data, perform exploratory data analysis tasks and build predictive models.

Assessment: 25% individual task, 30% group task, 25% project, 20% two quizzes

SIT113 Cloud Computing and Virtualisation

Cloud computing represents a significant shift in the delivery of Information Technology to end users by introducing the ability to deliver infrastructure, platforms, and software via the network. This unit explores the technologies, models, benefits and risks of cloud computing and includes a study of virtualization as one of the key building blocks of most cloud computing solutions. Upon completion of the unit students will have a clear understanding of cloud computing, the types of problems solved by cloud computing, and the issues that must be considered when deploying cloud technologies in an organisation.

Assessment: 40% assignments and practicals; 60% final examination

SIT120 Introduction to Apps Design

This unit teaches foundation concepts and skills related to mobile app design and development. Students will analyse existing mobile apps for different domains, appraise the type of design choices and technological choices used to solve a problem. They will also gain an understanding of different technologies and how they are put together in the context of mobile apps. A discussion

of the role of different backend technologies, mobile UI design, mobile platforms, and the mobile apps industry will also be covered. Finally, students will also gain an understanding of the social and ethical issues related to mobile apps, such as ethical and privacy issues.

Assessment: 50% assignments, 50% final examination

SIT151 Game Fundamentals

This unit introduces students to the basic concepts used in games design and development. Whilst the Games Design and Development Stream is open to Bachelor of Information Technology students, many students choose to study this unit as an elective adjunct to their studies in computing, multimedia, business, marketing, education and the arts. This unit focuses on why video games are such an important part in many aspects of society today.

Assessment: 10% online quiz, 50% three assignments (10%, 20%, 20%), 40% final examination

SIT153 Introduction to Game Programming (Not available in T2 2017)

This unit provides students with a comprehensive introduction to the C++ programming language; the principle programming language used in the development of computer and video games. Core language knowledge and programming skills are developed in the context of games software development tasks. Students will implement games from scratch using both procedural programming and object-oriented programming techniques. Additionally, students will develop an understanding of software architectures appropriate to the implementation of games and simulations. Topics covered in this unit include: data types, features of the C++ language, program flow control, classes and

class hierarchies, data input/output, error handling and debugging, introduction to programming with 2D graphics systems. Upon completion of this unit students will be able to develop software applications written in C++ to implement simple computer games using 2D graphics.

Assessment: 20% one project, 15% one assignment, 15% practical assessments, 50% final examination

SIT161 Principles of Interactive Media

Interactive media is one of the most rapidly developing areas in the computer industry; active and effective involvement in this field demands a thorough foundation in both the theory underlying the area, and the skills required of practitioners. This unit will provide media students with a theoretical and practical introduction to the field of interactive media. The unit will introduce the concepts of interactive and multimedia including its cultural and social context, and the foundations of games. The unit will examine the basic requirements for the creation and delivery of interactive media which effectively combines the digital formats of the 5 multimedia assets: text, images, sounds, video and animation, with the added element of interactivity provided by computer systems. It forms the theoretical basis for subsequent practical, organisational and theoretical inquiry into interactive media.

Assessment: 60% three assignments, 40% final examination

SIT162 Interactive Media Systems

Interactive Media is the combination of the digital forms of text, images, sounds, video and animation. This unit aims to build on the theories and principles of multimedia and provide students with a theoretical and practical introduction to design criteria and the design process of information delivered by multimedia. The unit will cover user needs analysis and designing for the user; selection

of suitable technology; designing for computer-based media; and the use of the major software tools and their accompanying skills.

Assessment: 60% three assignments, 40% final examination

SIT182 Real World Practices for Cyber Security

This unit of the information technology security course introduces students to the threats and risks in managing communication networks and provides them with a broad overview of the security technologies available to manage these threats. Organizational security is high-lighted with special attention to social engineering, ethics, policies, procedures and legislation. Case studies will be an important means of developing the understanding of the unit content.

Assessment: 30% two tests, 20% mid-term exam, 50% final examination

SIT190 Introductory Mathematical Methods

This unit aims to develop the fundamental functions of applied mathematics, and to introduce calculus to students who have not previously studied it in secondary school. It is designed to prepare students for tertiary level mathematics.

Topics to be addressed in this unit include: polynomials, exponentials, logarithms and trigonometric functions. Particular reference is made to the basic rules of algebra governing operations, functions and the solution of equations. The rules for differentiating and integrating elementary polynomial, exponential, logarithmic and trigonometric functions are introduced. Applications studied include graph sketching, maximisation and minimisation problems, areas and kinematics.

Assessment: 40% three assignments, 60% final examination.

SIT191 Introduction to Statistics and Data Analysis

The unit studies various methods of presenting and summarising data with graphical and numerical techniques. It also addresses data collection by studying sampling methods and experimental design. Sampling distributions and probability theory are studied as the basis of statistical inference. Statistical estimates and hypothesis tests involving one and two means, one and two proportions, correlation, regression and ANOVA are studied. Teaching methods include lectures and problem solving pracs, with most topics supplemented by computer activities using the statistical software SPSS.

The primary aim of this unit is to develop your understanding of the techniques needed in gathering and analysing information. Suitable procedures must be used at all times when dealing with data, or any inferences and conclusions made can be invalid.

Assessment: 30% three assignments (10% each), 10% practical exercises, 60% final examination

SIT192 Discrete Mathematics

Counting techniques are introduced and applied to the design and analysis of algorithms. The concepts of proof and logical reasoning, and the tools of Boolean algebra and graph theory are presented and applied to the design and analysis of algorithms. Advanced counting techniques assist in developing an understanding of algorithmic complexity. Particular applications to cryptography are given.

Assessment: 40% assignments, 60% final examination.

To be eligible to obtain a pass in this unit, students must achieve a mark of at least 40% in the examination