Information Technology
Game Programming ⟋
Diploma
Associate Degree
Bachelor Degree

Term 1 Subjects

Intro to Programming I (PRG1060)

This subject builds on the knowledge and skills students obtain in a beginner programming subject. Students will learn how to use programming, for example basic variable, constant and function to build small programs. This subject contains the fundamental programming concepts that all C plus plus programmers require.

Introduction to Web (INT1012)

This subject teaches the basic skills of writing HTML5, XHTML and CSS by hand. You will learn the fundamental skills to create web-sites and also learn the principles of good web design. Industry standard practices will be taught such as using proper naming conventions, manipulating and optimising images for the internet, writing basic web-pages using divs and CSS, providing navigation and creating interactive, functioning web-sites.

Information Systems (CMP1042)

This subject aims to provide students with an introductory look into the field of Information Systems (IS). The first half of the subject analyses the theories and applications Information Systems have for business solutions while the second half focuses more on the technology aspect of Information Systems and how to fully develop one.

Foundation Programming (CMP1041)

This subject provides essential skills in the conceptualisation and techniques of programming and software design. It introduces techniques for designing algorithms and implementing them as computer programs using a high-level programming language. Emphasis is placed on real world processing tasks, involving students in interactive program development, execution and verification. Students will learn techniques such as debugging and testing. Major areas that are covered will include OOP, data and controlling flow, and arrays. Students will also learn the basic design elements of programming and how to construct solutions using specifications. This subject is a part of system development management and system design that is a fundamental element of all Information Technologies programs. It builds on developed skills in development tools use and software development to focus on the creation of software project.

Term 2 Subjects

Database Systems (PRG1048)

This subject introduces basic concepts and principles of database systems, especially relational databases, to emphasise the importance of a well-designed database in practice. Students will learn how data is structured and managed within a relational database.

This subject is structured to walk students through the necessary steps to design conceptual and relational models, and implement these using basic DDL-SQL commands. Basic and advanced DML-SQL commands are also presented to enable retrieving accurate information from the database. Students are also encouraged to further explore other aspects of database systems, such as security and future databases.

Intro to Programming II (PRG1061)

In an age where data is a valuable commodity, the ability to create and maintain systems that collect and utilise information is an important skill. This subject will expand on the backend development skills that students have gained in previous subjects, and extend and apply these skills. In this subject students will create a simple API and a data-driven mobile application.

Discrete Mathematics (PRG1010)

Discrete Mathematics introduces you to a wide range of terminology and tools that have a particular use in Computer Science. The emphasis is placed on reasoned arguments and clarity of exposition as well as algebraic and computational skills. Topics covered in this unit include Sets, Mathematical Induction, Big O Notation, Logic, Predicate Calculus, Graphs, Linear Recurrence Relations, Sorting Methods, Relations and Partial Ordering.

Introduction to Software Engineering (CMP1043)

Designing quality computer programs is not a matter of luck. This course provides students with the skills and knowledge to design sound structured computer programs and then moves into a detailed examination of object oriented analysis and design using the Unified Modelling Language (UML). Students will understand the concepts and application of UML to software development, and will have opportunities to use UML for software creation while developing further understanding of software concepts and problem solving approaches. The role of software engineer and the software development life cycle will also be covered.

DIPLOMA EXIT – Students may graduate at this point with a Diploma of Information Technology (Game Programming)

Information Technology
Game Programming
Diploma
Associate Degree
Bachelor Degree

Term 3 Subjects

Basic Game Engine Programming (INT2001)
This subject will finish our study of C++ by examining templates, error handling, the standard template library and bitwise operations. Students will investigate and apply several useful STL data structures and algorithms and their underpinning concepts. The subject introduces Windows programming, animation and the rendering of 2D sprite images.

Java (PRG1049)
This course continues the examination of object-oriented programming using Java. It also introduces graphical user interface development using Java. Students learn the fundamental principles of interface development and are then required to apply these in the development of a program with a graphical interface this course also examines database connectivity and network application development using Java.

Digital Project Management (INT1050)
This subject teaches the basic principles of project management. Students will learn the essential theory of managing projects and will work in small teams to produce proper and complete documentation for a small project of their choice. The emphasis is on project management of typical tasks and on providing a thorough understanding of how project management can be vital for the successful completion of major tasks or tasks requiring many resources. These project management skills can be applied to a wide range of project types and contexts.

Systems Analysis and Design (CMP3045)
This subject introduces basic principles of software requirements, analysis and design. The objectives are to establish a requirement analysis and design templates where more detailed material regarding specific aspects of requirements and design techniques and issues fit. In doing so students will apply their skills and knowledge of understanding requirements, a range of modelling techniques, methodologies and approaches.

Term 4 Subjects

Interface Design (UX/UI) (DES1060)
User Experience (UX) is the term used to express how a user interacts with a system and how it makes them feel. It is the science & psychology of designing a users digital journey. In this subject students will learn how to analyse the interface requirements of a system, review and apply industry tools and techniques and evaluate whether a solution has met its requirements. Students will learn wireframing, testing and debugging and the interaction between form and function.

Artificial Intelligence (PRG2006)
This subject will introduce students to the concept of Artificial intelligence (AI), one of the critical components in a contemporary game development project. Students will develop a solid grasp on what the term "artificial" means. Artificial intelligence will be used it to produce gaming problems and solutions and to construct player challenges. Through a personal research project, students will engage in scientific writing and experimental analysis investigating Artificial Intelligence both theoretically and technically.

Advanced Game Engine Programming (INT2007)
This subject will introduce students to OpenGl and DirectX, a collection of application programming interfaces (APIs) for handling tasks related to multimedia, namely game programming and video. Students will learn elementary 3D techniques, including lighting, texturing, alpha blending and stenciling. Finally, students will learn how to use a graphic framework and the High-Level Shading Language, commonly used in 3D game programming.

Game Development (INT1029)
This subject introduces students to using an industry standard 3D game engine. Students will use this software for developing future games and major projects. The subject involves learning object oriented programming to design and develop interactive games. On successful completion of this subject, students will be able to operate a game engine proficiently to develop simple 3D games, become familiar with programming fundamentals and most importantly develop their problem solving skills.

ASSOCIATE DEGREE EXIT – Students may graduate at this point with an Associate Degree in Information Technology (Game Programming)

Information Technology
Game Programming

Diploma
Associate Degree
Bachelor Degree

Term 5 Subjects

Augmented Reality (PRG2006)

In this subject students will be introduced to the theory and practice of Augmented Reality (AR). Students will study the history of Augmented Reality technology and consider its practical applications in a contemporary context. The subject will cover processes for Augmented Reality development for games programming and students will engage in practical exercises for developing their own working Augmented Reality applications.

Advanced Game Development (INT3030)

Moving beyond character creation, this subject shows you the advanced techniques you need to create immersive and interactive 3D environments. Using state-of-the-art game engine Unity3D, which allows rapid game development, you will discover that much of the power of 3D comes from the ability to create environments within which real-time events can be rolled out, demonstrated or enacted, in simulation of real environments. Before you take this subject, think about completing both 3D Intro and 2D Interactivity.

Advanced Studio 1 (INT3506)

This subject is the first part of a two term project. This project aims to prepare students for career roles in a particular ICT discipline or focus area. Students will select a topic of interest and work closely with a supervisor throughout the project. Students can select to work individually (recommended) or within a team of two or three at most. Students, in consultation with the Dean of Studies, may form a cross-disciplinary team with students enrolled in Advanced Studio in the Bachelor of Interactive Media.

This project is strongly recommended to be taken only in final year, because students will be required to apply knowledge obtained from subjects delivered in the first two years in order to deliver satisfactory outcomes for this final Advanced Studio project. In Advanced Studio 1, students will consult with their supervisor to finalise their topics, develop a methodology, plan their milestones for both trimesters, and complete their research, literature review, analysis, and high level design phases of the project.

Elective

Term 6 Subjects

Advanced Game Programming Project x2 (INT1035)

This subject will introduce students to OpenGl and DirectX, a collection of application programming interfaces (APIs) for handling tasks related to multimedia, namely game programming and video. Students will learn elementary 3D techniques, including lighting, texturing, alpha blending and stenciling. Finally, students will learn how to use a graphic framework and the High-Level Shading Language, commonly used in 3D game programming.

Advanced Studio 2 (INT3516)

This subject is the second part of a two term project. Students must successfully complete Advanced Studio 1 in order to enrol in this subject. In Advanced Studio 1, students would have already selected their topics, completed the research and analysis parts of the project.

In Advanced Studio 2, students will continue their projects from Advanced Studio 1, and complete their projects with low level design, implementation, prototype and final presentation according to a timeline and plan as set in Advanced Studio 1. The whole project encourages students to properly complete a project of their own, following industry processes, standards and disciplines in order to prepare students for career roles in their focus area.

Elective

BACHELOR OF INFORMATION TECHNOLOGY– Students will graduate at this point with a Bachelor Degree in Information Technology (Game Programming)

Information Technology
Game Programming
Diploma
Associate Degree
Bachelor Degree

AIT — Creative Technology Educators

Bachelor of Information Technology (Game Programming)
Course Structure

T1	Introduction to Web INT1012	Intro to Programming I PRG1060	Foundation Programming CMP1041	Information systems CMP1042
T2	Database systems PRG1048	Intro to Programming II PRG1061	Discrete Mathematics PRG1010	Software & Engineering CMP1043

Diploma Exit

T3	Basic Game Engine Programming INT2001	JAVA PRG1049	Digital Project Management INT1050	Analysis and Design CMP3045
T4	Interface & Experience Design (UX/UI) DES1060	Artificial Intelligence PRG2006	Advanced Game Engine Programming INT2007	Game Development INT1029

Associate Degree Exit

T5	Elective 1	Augmented Reality PRG3002	Advanced Game Development INT3030	Advanced Studio 1 INT3506
T6	Elective 2	Advanced Game Project INT1035	Advanced Game Project INT1035	Advanced Studio 2 INT3516

Bachelor Degree Completion

Electives:
Electives are subject to availability and certain electives have pre-requisites.

Miscellaneous
Internship SPC3038

Programming Related
Enterprise Systems CMP1046
Mobile Apps Android PRG1050
Data-Driven Apps INT3053
Advanced Web INT1059
Cross-Platform Apps INT3052

Comp Sci Related
Foundation Networks CMP3044

Design Related
Digital Images DES1013