Introductory Units

Programming & Problem Solving
This is the first programming unit. You might think that you know how to program already but this unit teaches you to program in a systematic manner with a design that reflects the structure of the problem to be solved. Currently the programming language used is Java. Programming exercises are introduced in the context of small games problems.

Programming with Data Structures
This unit is not just about learning more Java. Its proper focus is on how to develop programs that fulfil specifications and are properly tested. At the same time you learn about the different way data can be organised in programs. Small games are used to illustrate the many programming concepts introduced in this unit.

Games Fundamentals
Students will explore the roles of computer games in society through the study of different game genres, the history of computer games, the demography of the games industry, and through critical review of individual games. Students will also develop a simple 2D game of their choice using a game development environment.

Games Physics
Students will be introduced to basic physics and mathematics concepts and shown how these concepts are then applied in the field of computer games and related to the solution of problems that arise in many computer games. In addition, the unit will employ an appropriate game engine to allow students to develop a simple 2D game that uses many of these physics and mathematics concepts.

Intermediate Units

Games Design and Production
Game design is one of the most crucial aspects of game production. Students will apply game design theory and processes by developing new levels, 3D assets and possibly game mechanics for a 3D game engine. Students will cover all stages of development from the initial idea through to implementation and quality assurance with a focus on game design.

Computer Graphics & Animation
Students in this unit produce incredible assignments of animated shapes and characters. You study the algorithms and object-oriented programming techniques used to create these, and you have ample opportunity to practice.

Algorithms
Some programs tackle tasks that would take several years to solve with a simple approach, but can be solved within seconds with a smart approach.

This unit will teach you the data structures, algorithms and techniques for writing programs that work smarter rather than harder. You will also learn how to analyse programs so that you can make an informed choice about which algorithm to use for a particular problem.

ICT Project Management
The ICT profession is largely people centered rather than technology centered. You have to be able to communicate your expertise.

Students will develop skills appropriate to professional computing employment, particularly written, verbal and interpersonal communication skills. Students will also experience the principles, techniques and tools of project management.
Advanced Units

Games Project A & B
Many students obtain their first job on the basis of the work that they have done on their project. Projects are undertaken as a team working together to produce a substantial computer game for one of the game consoles.

Advanced Games Programming
Students will explore the techniques to craft a modern game engine, from the technologies involved in fast rendering through to underlying support structures that produce the gaming environment. Students will develop a simple 3D game of their choice using a game development environment.

Multi-core Architecture and Programming
Students will explore the current and future trends of hardware design and the associated programming techniques necessary for such architectures. The practical work will focus on a particular high-performance architecture - the PlayStation 3. Students will learn generic high-performance programming concepts such as threading, single-instruction multiple-data (SIMD) instructions, direct memory access (DMA), and synchronisation primitives.

Artificial Intelligence
No one has yet made a C3PO-like multi-lingual intelligent robot, but the study of Artificial Intelligence has led to more useful robots and better language-related applications.

In this unit you study the core concepts of AI and are introduced to the techniques used in various sub-fields such as expert systems, machine learning, computer vision and robotics.

Mobile and Ubiquitous Computing
This unit studies how mobile communications are achieved: the technology and digital protocols used by mobile phones and how mobile communications fit into a traditional wired network structure such as the internet. The emphasis is on the current state of the industry, standardisation and the integration of the many aspects of computing that come together in this field.

Other Units

Students are advised to take some Computing units as electives to round out their Games Technology degree and be suitable as an employee in any ICT field. The Computing units are described on another handout, but some suggested units are shown below. Students are also advised to take a maths or physics unit.

Computer Systems Fundamentals
This unit introduces you to foundation concepts of modern computer systems architectures and their operating systems.

Data Management
Students will be introduced to concepts and techniques necessary for the effective organisation, manipulation and analysis of shared data. Students will learn how to apply these concepts with an emphasis on relational databases. XML and SQL are introduced as commonly used languages to manage data.

Computer Networks
The biggest growth area in computing is in networking. In order to make networks work you need to study how data can be transmitted and the various protocols that are used to achieve this. You will also gain practical experience in installing and administering a network.

Advanced Dynamic Web Development
This unit is about the latest techniques used in web page development. Currently it focuses on the development of interactive sites, where users supply data to the server and responses come from databases storing graphics, video and audio data as well as textual information about a product or service.

Computer Security
The threats to computer systems are real. In this unit you will learn about the threats and the people that perpetrate attacks. You study the theoretical techniques that can be used to protect computer systems and networks before examining how some of these can be applied.

Contacts
School of Computing & Information Systems
University of Tasmania

Email:  Secretary@cis.utas.edu.au
Web: www.cis.utas.edu.au

Private Bag 87
Hobart Tasmania 7001
Phone: 03 6226 2900
Fax: 03 6226 2913