



The University of Southern Queensland

## Course specification

The current and official versions of the course specifications are available on the web at  
<<http://www.usq.edu.au/coursespecification/current>>.  
Please consult the web for updates that may occur during the year.

### Description: Computer Games Programming

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
CSC	3418	90729	2, 2009	EXT	1.00	Toowoomba

<b>Academic group:</b>	FOSCI
<b>Academic org:</b>	FOS003
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	020115

### STAFFING

Examiner: Kenneth MacAlpine  
Moderator: Stijn Dekeyser

### REQUISITES

Pre-requisite: CSC2402 or CIS3001 or USQIT16

### OTHER REQUISITES

Recommended Pre-requisite: CSC3406

### RATIONALE

Computer games have evolved from being developed by individuals and novice programmers to major commercial projects produced by teams of 20 or more people working, in some cases, for years on a particular product. It is a rapidly growing industry, employing large numbers of people. As the complexity of games has increased, development roles have become more defined and games' programmers now need to have clearly marked areas of specialist knowledge and skills. With an increasing interest in games research arising in Universities, it is essential today's games' programmers not only know how to work with the traditional fundamentals of games programming but also have a firm basis of knowledge in theoretical academic techniques in order to implement them in the games of the future.

### SYNOPSIS

This course brings the current research and tools for creating computer games and presents them to the student in a tutorial-based approach. It provides an in-depth examination of 3D game environment programming in JavaScript with DirectX, 3D modelling, player behaviour and believable character development. It will cover areas of particular interest to the International Game Developers Association such as best programming practices, pathfinding, decision trees, finite state machines, rule-based systems and goal-oriented action planning. This course follows the programmatic evolution of a computer game through the use of game engine APIs towards a student team developed game application.

## OBJECTIVES

On completion of this course students will be able to:

1. discuss the theoretical aspects of computer games design and programming; (Assign. 1, 2, 3 & 4)
2. describe the important techniques that facilitate implementation of efficient algorithms in games programming; (Assign. 4)
3. discuss games genre, player requirements and suspension of disbelief; (Assign. 3 & 4)
4. use traditional and contemporary artificial intelligence techniques in games programming; (Assign. 3 & 4)
5. build a 3D gaming environment; (Assign. 1, 2, 3 & 4)
6. demonstrate the modelling process of a 3D character avatar and discuss body proportions and environmental influences on body posture is only taught in the textbook and as part of a tutorial. They will learn it but not be assessed for it as we have found in previous years that people get caught up doing too much modeling.
7. immerse and animate a 3D character avatar in a 3D gaming environment; (Assign. 4)
8. discuss the issues relevant to suspension of disbelief and the creation of believable gaming environments; (Assign. 3 & 4) and
9. claim practical experience with games programming. (Assign. 1, 2, 3 & 4)

## TOPICS

	Description	Weighting (%)
1.	Introduction	5.00
2.	3D modelling, human proportions, body language and kinematics	15.00
3.	Games theory and competitive human behaviour	15.00
4.	Knowledge representation and reasoning techniques	15.00
5.	Game specific artificial intelligence techniques	20.00
6.	Agent architectures	10.00
7.	Suspension of disbelief and elements of believable behaviour	20.00

## TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

The course website is now at <http://usqstudydesk.usq.edu.au>. They will require access to this as all announcements and required software updates will be hosted here. They will not require Visual Studio, however they will require DXStudio (included on the CD-ROM). A license for DXStudio will be provided to the students on the website when semester starts.

(The course website is now at <http://usqstudydesk.usq.edu.au>. They will require access to this as all announcements and required software updates will be hosted here. They will not require Visual Studio, however they will require DXStudio (included on the CD-ROM). A license for DXStudio will be provided to the students on the website when semester starts.)

## REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

Bratko, I 2001, *PROLOG: programming for artificial intelligence*, Addison Wesley, Harlow, England.

(ISBN: 0201-40375-7)

Hill, FS & Kelly, SM 2006, *Computer graphics using OpenGL*, 3rd edn, Prentice Hall, Harlow, England.

(ISBN: 0-02-354856-8)

Lamothe, A 2002, *Tricks of the Windows game programming gurus*, 2nd edn, SAMS, Indianapolis. (ISBN: 0672323699 Also available electronically through Safari books and Netlibrary via library catalogue)

Lamothe, A 2003, *Tricks of the 3D game programming gurus-advanced 3D graphics and rasterization*, 1st edn, SAMS, Indianapolis.

(ISBN: 062318350)

Rabin, S 2002, *AI game programming wisdom*, Charles River Media, Hingham, Mass.

(ISBN: 1-58450-077-8)

Rabin, S 2003, *AI game programming wisdom 2*, Charles River Media, Hingham, Mass.

(ISBN: 1 58450 289 4)

Russell, S & Norvig, P 2003, *Artificial intelligence: a modern approach*, 2nd edn, Prentice Hall, Upper Saddle River, NJ.

(ISBN: 0-13-103805-2)

Watt, A & Policarpo, F 2000, *3D games: real-time rendering and software technology*, Addison Wesley, Harlow, England, Vol 1.

(ISBN: 02 0161 9210)

Watt, A & Policarpo, F 2003, *3D games: animation and advanced real-time rendering*, Addison Wesley, Harlow, England, Vol 2.

(ISBN: 0201787067)

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assessments	60.00
Directed Study	50.00
Private Study	50.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
ASSIGNMENT 1	100.00	10.00	14 Aug 2009
ASSIGNMENT 2	100.00	20.00	04 Sep 2009
ASSIGNMENT 3	100.00	30.00	25 Sep 2009
ASSIGNMENT 4	100.00	40.00	23 Oct 2009

## IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:**

There are no attendance requirements for this course. However, it is the students' responsibility to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.
- 2 Requirements for students to complete each assessment item satisfactorily:**

To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available for each assessment item.
- 3 Penalties for late submission of required work:**

If students submit assignments after the due date without (prior) approval of the examiner then a penalty of 5% of the total marks gained by the student for the assignment may apply for each working day late up to ten working days at which time a mark of zero may be recorded. No assignments will be accepted after model answers have been posted.
- 4 Requirements for student to be awarded a passing grade in the course:**

To be assured of receiving a passing grade a student must achieve at least 50% of the total weighted marks available for the course.
- 5 Method used to combine assessment results to attain final grade:**

The final grades for students will be assigned on the basis of the weighted aggregate of the marks obtained for each of the summative assessment items in the course.
- 6 Examination information:**

There is no examination in this course.
- 7 Examination period when Deferred/Supplementary examinations will be held:**

As there are no examinations in this course, there will be no deferred or supplementary examinations.
- 8 University Regulations:**

Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL <http://www.usq.edu.au/corporateservices/calendar/part5.htm> or in the current USQ Handbook.

## ASSESSMENT NOTES

- 9 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner.**

10 If requested, students will be required to provide a copy of assignments submitted for assessment purposes. Such copies should be despatched to USQ within 24 hours of receipt of a request being made.

### **OTHER REQUIREMENTS**

1 Students will require access to e-mail and internet access to UConnect for this course.

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