COURSE OUTLINE

SGD240 Advanced Games Programming

School: School of Business and Creative Industries

2025 | Semester 2

UniSC Sunshine Coast UniSC Moreton Bay	BLENDED LEARNING	Most of your course is on campus but you may be able to do some components of this course online.
Online	ONLINE	You can do this course without coming onto campus, unless your program has specified a mandatory onsite requirement.

Please go to unisc.edu.au for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1. Description

This course extends on the fundamental concepts of object-oriented games programming acquired in SGD213. In this course, you will develop advanced skills and expertise specific to programming for computer game development. Topics covered will include movement and collision detection, physics systems, camera systems, artificial intelligence (pathfinding and intelligent agents), procedural generation, networked games programming and programming for animated characters. Focussing on a specific topic, you will identify and communicate essential theoretical concepts in the design and creation of advanced gameplay prototypes.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Interactive online learning activities.	1hr	Week 1	12 times
Tutorial/Workshop 1 – Scheduled face to face workshops.	2hrs	Week 1	12 times
ONLINE			
Learning materials – Interactive online learning activities.	1hr	Week 1	12 times
Tutorial/Workshop 1 – Scheduled online workshops (Recorded).	2hrs	Week 1	12 times

1.3. Course Topics

- Movement and collision detection
- Physics for gameplay
- Camera systems
- Artificial intelligence (pathfinding and intelligent agents)
- Procedural generation
- Programming networked games
- Programming for animated characters

2. What level is this course?

200 Level (Developing)

Building on and expanding the scope of introductory knowledge and skills, developing breadth or depth and applying knowledge and skills in a new context. May require pre-requisites where discipline specific introductory knowledge or skills is necessary. Normally, undertaken in the second or third full-time year of an undergraduate programs.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES On successful completion of this course, you should be able to...		GRADUATE QUALITIES Completing these tasks successfully will contribute to you becoming...
1	Design, research, and develop game components for distribution.	Engaged
2	Apply technical skills and frameworks to contribute to the development of games.	Empowered
3	Communicate knowledge about your chosen programming speciality and its value and contribution to the game development process.	Knowledgeable

5. Am I eligible to enrol in this course?

Refer to the UniSC Glossary of terms for definitions of “pre-requisites, co-requisites and anti-requisites”.

5.1. Pre-requisites

SGD213

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

5.5. Microcredential Information

Not applicable

6. How am I going to be assessed?

6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

6.2. Details of early feedback on progress

There will be a concept quiz in week 4 that forms early feedback.

6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Case Study	Individual	20%	1000 Words	Week 4	Online Submission
All	2	Journal	Individual	30%	1500 Words (equivalence including example code)	Week 9	Online Submission
All	3	Artefact - Creative	Individual	50%	An artefact game or game system that includes the application of an advanced gameplay functionality.	Week 13	Online Submission

All - Assessment Task 1: Historical Game Programming Analysis

GOAL:	Students are to select an historical game to analyse, The analysis should investigate the approach and design of solutions for a particular gameplay system/s within the gaming context.
PRODUCT:	Case Study
AUTHORSHIP STATEMENT:	
FORMAT:	Academic Format: Case study - 1000 words This assessment requires students to select from a range of historical games and analyse the coding design and the methodology used to implement a particular system/s. Students are to perform an analysis of the approach to programming used for the creation of the game and discuss the effectiveness of the solutions used. Note that the analysis should be a critique, rather than a review. A critique breaks down the object of study, using theoretical concepts systematically to structure and support the discussion.
CRITERIA:	**No.** / **Learning Outcome assessed** 1 Demonstrates sound understanding of core games programming concepts — 3 2 Deconstruct programming techniques applied in a particular game and discuss the effectiveness of the solutions used — 1 3 3 Analyse, describe and communicate advanced concepts of game programming design — 1 3
GENERIC SKILLS:	Communication, Problem solving

All - Assessment Task 2: Journal

GOAL:	Students are to record weekly workshop activity and document the research and design undertaken in developing the solution for their final game prototype project. Additional details on Canvas.
PRODUCT:	Journal
AUTHORSHIP STATEMENT:	
FORMAT:	Students must create a developers journal/blog in which they document their activity and learning during tutorial sessions along with the research and design they have undertaken in developing their game prototype project. Students will be presenting their work/findings in the submission weeks tutorial.
CRITERIA:	

No.		Learning Outcome assessed
1	Demonstrates a critical understanding of the key concepts of game programming as covered in the course learning materials, tutorials and workshops	1 2 3
2	Provides evidence of the application of a range of practical programming skills in areas such as, procedural content generation, artificial intelligence, networking and shader programming	1 2 3
3	Journal entries are clearly written, concise and accurate, demonstrating an informed development process.	2 3
4	The journal demonstrates an adequate and consistent use of scholarly practice (such as citations and references), in an appropriate academic format.	1 3

GENERIC SKILLS:	Communication, Problem solving, Organisation, Applying technologies

All - Assessment Task 3: Game/Gameplay System Programming Artefact

GOAL:	Students are to program a prototype game/gameplay system that demonstrates understanding of the theoretical and practical aspects of the unit through the application of advanced game programming techniques. The students should focus their work on the implementation of a core game system to an advanced level of functionality. Examples of such systems include procedural level generation, enemy AI including pathfinding, multiplayer networking, advanced shader programming or advanced physics systems.
PRODUCT:	Artefact - Creative
AUTHORSHIP STATEMENT:	
FORMAT:	Professional/Industry Format: The artefact should be developed in a real-time 3D game engine

CRITERIA:

No.		Learning Outcome assessed
1	Demonstrates a critical understanding of the key concepts covered in the learning materials, tutorials and workshops	1 2
2	Provides evidence of advanced programming techniques and methods such as the use of appropriate data structures and modularisation of code into specific classes and methods.	1 2 3
3	Demonstrates the appropriate use of production methodologies in the design and structure of classes, collections and algorithms.	1 2 3
4	Artefact has been suitably tested and either performs as expected or, if bugs are present, they have been identified and documented in the journal (assessment 2)	1 2 3
5	Consistent quality and standards in writing code	2 3

GENERIC SKILLS:	Problem solving, Applying technologies, Information literacy

7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

8.1. Prescribed text(s) or course reader

> There are no required/recommended resources for this course.

8.2. Specific requirements

This course requires some free professional games development software which is provided at UniSC campuses for student use. If you elect to do this course online, you will need to install this software on your own computer or attend a campus at which it is available. The software requires a large amount of disk space and a higher-end computer.

9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. It is your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the online induction training for students, and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

10.2. Assessment: Additional Requirements

Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:
(a) The final mark is in the percentage range 47% to 49.4%; and
(b) The course is graded using the Standard Grading scale

10.3. Assessment: Submission penalties

Late submissions may be penalised up to and including the following maximum percentage of the assessment task's identified value, with weekdays and weekends included in the calculation of days late:
(a) One day: deduct 5%;
(b) Two days: deduct 10%;
(c) Three days: deduct 20%;
(d) Four days: deduct 40%;
(e) Five days: deduct 60%;
(f) Six days: deduct 80%;
(g) Seven days: A result of zero is awarded for the assessment task.

The following penalties will apply for a late submission for an online examination:
Less than 15 minutes: No penalty
From 15 minutes to 30 minutes: 20% penalty
More than 30 minutes: 100% penalty

10.4. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.5. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The Student Charter sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

10.6. General Enquiries

In person:

- **UniSC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **UniSC Moreton Bay** - Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **UniSC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **UniSC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **UniSC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **UniSC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

Tel: +61 7 5430 2890
Email: studentcentral@usc.edu.au