



## COURSE OUTLINE

# SGD240 Advanced Games Programming

**Course Coordinator:** Justin Carter (jcarter3@usc.edu.au) **School:** School of Business and Creative Industries

2021 | Semester 2

USC Sunshine Coast

ON CAMPUS

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.

*Please go to the USC website 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
<b>ON CAMPUS</b>			
<b>Laboratory 1</b> – In-class laboratory	2hrs	Week 2	12 times
<b>Lecture</b> – 1 hour online lecture content for 12 weeks (or equivalent).	1hr	Week 1	12 times
<b>ONLINE 1</b>			
<b>Laboratory 1</b> – Interactive zoom labortory	2hrs	Week 2	12 times
<b>Lecture</b> – 1 hour online content for 12 weeks (or equivalent).	1hr	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	GRADUATE QUALITIES
On successful completion of this course, you should be able to...	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 [USC 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

## 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	Quiz/zes	Individual	10%	Multiple choice and short answer quiz to ascertain understanding of vital concepts	Week 4	Online Test (Quiz)
All	2	Artefact - Technical and Scientific, and Written Piece	Individual	40%	Part 1: Up to 7 Core Reports + 1 Self-Assessment, Part 2: Up to 7 C++ Projects	Week 7	Online Assignment Submission
All	3	Artefact - Technical and Scientific, and Written Piece	Individual	50%	Part 1: Up to 7 Specialty Reports + 1 Self-Assessment + 750 Word Research Report, Part 2: Up to 7 Unreal Engine C++ Projects + Documentation	Week 13	Online Assignment Submission

All - Assessment Task 1: Quiz/zes

<b>GOAL:</b>	Apply existing programming knowledge and newly acquired professional practice skills in a quiz format, to both further your understanding of assessed topics, and to gauge current knowledge.													
<b>PRODUCT:</b>	Quiz/zes													
<b>FORMAT:</b>	Academic Format: Online multiple choice and short answer quiz													
<b>CRITERIA:</b>	<table border="1"> <thead> <tr> <th>No.</th> <th></th> <th>Learning Outcome assessed</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Demonstrates sound understanding of core games programming topics</td> <td>3</td> </tr> <tr> <td>2</td> <td>Consistent quality and standards in writing code</td> <td>2</td> </tr> <tr> <td>3</td> <td>Adheres to professional practice in writing code</td> <td>1 2</td> </tr> </tbody> </table>	No.		Learning Outcome assessed	1	Demonstrates sound understanding of core games programming topics	3	2	Consistent quality and standards in writing code	2	3	Adheres to professional practice in writing code	1 2	
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1	Demonstrates sound understanding of core games programming topics	3												
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All - Assessment Task 2: Reports and Self-Assessment Portfolio

<b>GOAL:</b>	Apply technical skills and frameworks in the research and development of game components and communicate the knowledge to others via appropriate formats.
<b>PRODUCT:</b>	Artefact - Technical and Scientific, and Written Piece
<b>FORMAT:</b>	<p>Professional/Industry Format:</p> <p>Part 1: A small activity which addresses a gap in knowledge or skill, with a report that concisely communicates to other programmers.</p> <p>Part 2: C++ Project which applies and demonstrates the knowledge through an appropriate communication method.</p>

CRITERIA:	No.	Learning Outcome assessed
	1 Adheres to the structural protocol for design reports	2
	2 Demonstrates proficient detail in documenting the programming process	3
	3 Communicates effectively and concisely	1 3
	4 Reflects logically on problem solving progress and areas for improvement	1 3
	5 Demonstrates capability in the core requirements of game development	1
	6 Consistent quality and standards in writing code	1 2

### All - Assessment Task 3: Game Programming Projects

<b>GOAL:</b>	Apply technical skills and frameworks in the research and development of game components and communicate the knowledge to others.	
<b>PRODUCT:</b>	Artefact - Technical and Scientific, and Written Piece	
<b>FORMAT:</b>	Professional/Industry Format:  Part 1: A small activity which addresses a gap in knowledge or skill, with a report that concisely communicates to other programmers  Part2: Unreal Engine C++ Project which applies and demonstrates the knowledge through the spike report.	
<b>CRITERIA:</b>	<b>No.</b>	<b>Learning Outcome assessed</b>
	1 Adheres to the structural protocol for spike reports	2
	2 Communicates effectively and concisely	3
	3 Reflects logically on problem solving progress and areas for improvement	2 3
	4 Demonstrates capability in the core requirements of game development	1 2
	5 Consistent quality and standards in writing code	2 3

## 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. Directed study hours may vary by location. 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 Blackboard 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

Not applicable

## 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 Blackboard, are electronically checked through SafeAssign. This software allows for text comparisons to be made between your submitted assessment item and all other work that SafeAssign has access to.

### 10.2. Assessment: Additional Requirements

Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:

The final mark is in the percentage range 47% to 49.4%

The course is graded using the Standard Grading scale

You have not failed an assessment task in the course due to academic misconduct

### 10.3. Assessment: Submission penalties

Late submission of assessment tasks may be penalised at the following maximum rate:

- 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task.

- 10% (of the assessment task's identified value) for the third day - 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task.

- A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task. Weekdays and weekends are included in the calculation of days late. To request an extension you must contact your course coordinator to negotiate an outcome.

### 10.4. Study help

For help with course-specific advice, for example what information to include in your assessment, you should first contact your tutor, then your course coordinator, if needed.

If you require additional assistance, the Learning Advisers are trained professionals who are ready to help you develop a wide range of academic skills. Visit the [Learning Advisers](#) web page for more information, or contact Student Central for further assistance: +61 7 5430 2890 or [studentcentral@usc.edu.au](mailto:studentcentral@usc.edu.au).

### 10.5. Wellbeing Services

Student Wellbeing provide free and confidential counselling on a wide range of personal, academic, social and psychological matters, to foster positive mental health and wellbeing for your academic success.

To book a confidential appointment go to [Student Hub](#), email [studentwellbeing@usc.edu.au](mailto:studentwellbeing@usc.edu.au) or call 07 5430 1226.

### 10.6. AccessAbility Services

Ability Advisers ensure equal access to all aspects of university life. If your studies are affected by a disability, learning disorder mental health issue, injury or illness, or you are a primary carer for someone with a disability or who is considered frail and aged, [AccessAbility Services](#) can provide access to appropriate reasonable adjustments and practical advice about the support and facilities available to you throughout the University.

To book a confidential appointment go to [Student Hub](#), email [AccessAbility@usc.edu.au](mailto:AccessAbility@usc.edu.au) or call 07 5430 2890.

## 10.7. 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
- Administration of Central Examinations
- Deferred Examinations
- Student Academic Misconduct
- Students with a Disability

Visit the USC website: <http://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching>

## 10.8. General Enquiries

### In person:

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

**Tel:** +61 7 5430 2890

**Email:** [studentcentral@usc.edu.au](mailto:studentcentral@usc.edu.au)