SM3608: 3D GAME PRODUCTION

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
3D Game Production

Subject Code
SM - School of Creative Media

Course Number
3608

Academic Unit
School of Creative Media (SM)

College/School
School of Creative Media (SM)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
SM2603 2D Game Production or equivalent

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

The course aims to acquire the current and latest game development techniques for 3D game production. The student will expose to tools, techniques and ideas for game development, and the topics will include graphics game engine, game loop, 2D/3D Math, 3D animation, interactions in game play, audio programming, physics and artificial intelligence.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Analyze and evaluate various types of computer game			x	
2	Acquire general knowledge of 3D game program development			x	
3	Design a computer game		x	x	
4	Implement a computer game			x	x
5	Appreciate games designs and complexities		x		
6	Associate, combine and integrate knowledge from different disciplines (e.g. mathematics, sciences, physics etc.) into course assignments		x	x	x

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Analysis Report	Case study a computer game and write a simple game analysis.	1	3 hrs
2	Lecture and Tutorial	Lecture with interactivity. Tutorial with case study, laboratory exercises and assignments.	2, 4, 5	3-4 hrs / wk
3	Project	Document the game design	3	3 hrs
4	Project	Implement and play-test the game designed in CILO 3	4, 6	18 hrs

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Coursework / Programming Assignment / Quiz	1, 2, 3, 4, 5, 6	85	-	No
2	Presentation	2, 3, 4	15	-	No

Continuous Assessment (%)

100

Examination (%)

0

Assessment Rubrics (AR)

Assessment Task

1. Coursework

Criterion

Students should demonstrate ability to utilize primary and secondary sources, build up argument and analysis. The threshold of ‘discovery’ lied in a student’s self initiatives to conduct additional research and to personalize theories for her/his personal daily experience.

Excellent (A+, A, A-)

-Excellent grasp of research material, able to explain key concepts, assumptions and debates
-Rigorous organization, coherent structure, distinct thesis, properly argued with strong narrative
-Insightful interpretation of the subject matter with distinct themes and thesis
-Critical analysis with insightful comments opening up new issues, or suggesting the ability to theorize
-Ability to approach a text or a theme using a variety of theories and analytical tools
-Strong bibliography suggesting breadth and depth of coverage and informed insights

Good (B+, B, B-)

-Firm grasp of materials, able to explain key concepts and assumptions
-Reasonable organization, balanced structure, adequate content, sufficient ability to integrate various resources based on demand
-Clear ideas which keep to the point, clear-cut subject, ability to interpret opinions independently
-Organized bibliography which can be utilized in accordance with the topic

Fair (C+, C, C-)

-Comprehensive grasp of materials, able to explain key concepts
-Fair organization, weak structure, adequate content, fair ability to integrate various resources based on demand
-Relevant points to the subject matter, fair ability to interpret opinions
-Unorganized bibliography which can be utilized in accordance with the topic

Marginal (D)

-Loose grasp of materials, cannot explain key concepts
-Poor organization and structure, weak content, limited use of resources
-Relevant points to the subject matter, marginal ability to interpret opinions
-Insufficient and/or unorganized bibliography

Failure (F)

-Poor grasp of materials
-No organization and structure, inadequate content, no/ irrelevant use of resources
-Irrelevant points to the subject matter, minimal ability to interpret opinions
-Irrelevant bibliography

Assessment Task

2. Presentation

Criterion

This assessment will grade on content and fluency of presentation. Students should show their co-operation to conduct a well-organized presentation with their own argument and evidence from readings and notes. The threshold of ‘discovery’ lied in a student’ s self initiatives to conduct additional research and to personalize theories for her/his personal daily experience.

Excellent (A+, A, A-)

-Rich, informative content, excellent grasp of the material with in-depth and extensive knowledge of the subject matter
-Rigorous organization, coherent structure, and systematic exposition with a strong sense of narrative
-Superior presentation skills: distinct pronunciation, fluent expression and appropriate diction, exact time-management
-Critical analysis with insightful comments opening up new issues, or suggesting the ability to theorize

Good (B+, B, B-)

-Adequate content with firm grasp of the material that informs the audience on a subject matter
-Reasonable organization, balanced structure and composition
-Good verbal communication: comprehensible pronunciation, fluent expression and diction, fair time-management

Fair (C+, C, C-)

-Adequate content with comprehensive grasp of the material demonstrating basic knowledge of the subject matter
-Fair organization, weak structure and composition
-Fair presentation skills: acceptable pronunciation, expression and diction, fair time-management

Marginal (D)

-Weak content, loose grasp of the general ideas with some knowledge of the subject matter
-Poor organization, structure and composition
-Poor presentation skills: marginal pronunciation, expression and diction, poor time-management

Failure (F)

-Inadequate content, fail to identify the general ideas with knowledge of the subject matter
-No organization, structure or/and composition
-Poor presentation skills: marginal pronunciation, expression and diction, minimal time-management

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Assessment Task

3. Computer Programming Assignments

Criterion

Students should demonstrate ability to design and code a program according to instructions.

Excellent (A+, A, A-)

-The program runs and completes all required tasks; handles special cases accordingly; executes without errors
-Includes all appropriate input prompts and explains/ describes all output values
-Variables and methods are named appropriately and used efficiently
-Appropriate tabbing; good use of white space
-Well-organized and easy to follow
-Excellent inline code comments and documentation

Good (B+, B, B-)

- The program runs and completes most tasks appropriately; fails to work for special cases; executes with a few errors
- Some input or output prompts / descriptions are inappropriate

- Variables and methods are named and used appropriately
- Appropriate tabbing; use of white space
- Fairly organized but easy to follow
- Contains required heading with program description; effective use of comments

Fair (C+, C, C-)

- The program runs and completes a few tasks; fails to work for special cases; gives incorrect results for most input
- Some input or output prompts / descriptions are missing
- The use of some variables and method names are inappropriate / over-used / under-used and some methods are used inefficiently
- Inappropriate use of tabbing / white space
- Poorly organized but still readable
- Contains required heading; appropriate use of comments

Marginal (D)

- The program fails to execute due to errors
- Lack most input and output descriptions
- Poor use of variable / method name; variables / methods are used inappropriately
- Inappropriate use of tabbing and white space
- Poorly organized; difficult to read
- Appropriate heading; ineffective use of comments

Failure (F)

- The program fails to execute due to errors
- Lack all input and output descriptions
- Poor use of variable and method name; variables and methods are used inappropriately
- Poor use of tabbing and white space
- Not organized; not readable
- Missing heading; no comment included

Additional Information for AR

All A+/A/A- grade assignment should comply with the highest performance of Discovery-oriented learning.

Part III Other Information

Keyword Syllabus

Game; software development; network/online application; user interface; software engineering; computer graphics; interaction control; audio; digital entertainment; artificial intelligence; DirectX; XNA; OpenGL; Unity; 3D Math; Collision detection and resolution.

Reading List

Compulsory Readings

	Title
1	Frank D. Luna. (2008). “Introduction to 3D Game Programming with DirectX 10”. Jones & Bartlett.
2	Stephen Cawood and Pat McGee. (2009). “Microsoft XBA Game Studio Creator’s Guide (2nd Edition)”. McGraw-Hill Osborne.
3	Rob Miles. (2009). "Microsoft XNA Game Studio 3.0: Learn Programming Now!”. Microsoft Press.
4	Joseph B Hall. (2007). “XNA Game Studio Express: Developing Games for Windows and the Xbox 360”. Course Technology PTR.
5	Will Goldstone. (2009). “Unity Game Development Essentials”. Packt Publishing.
6	Jeremy Alessi. (2010). “iPhone 3D Game Programming All In One”. Course Technology PTR.

7	David M. Bourg. (2002). “Physics for Game Developers,” O’Reilly.
8	Fletcher Dunn and Ian Parberry. (2002). “3D Math Primer for Graphics and Game Development,” WordWare Publishing Inc.
9	Steve Rabin. (2002). “AI Game Programming Wisdom (Series from 1 to 4)” Charles River Media.
10	Dave Shreiner, The Khronos OpenGL ARB Working Group. (2009). “OpenGL Programming Guide: The Official Guide to Learning OpenGL, Versions 3.0 and 3.1”. Addison-Wesley.
11	David H. Eberly. (2006) “3D Game Engine Design (2nd Edition) – a Practical Approach to Real-time Computer Graphics,” Morgan Kaufmann.
12	Jason Gregory, Jeff Lander, Matt Whiting. (2009). “Game Engine Architecture”. A K Peters/CRC Press.
13	Mike McShaffry. (2009) “Game Coding Complete (3rd Edition)”. Charles River Media.
14	Nik Lever. (2002). “Realtime 3D Character Animation with visual C++,” Focal Press.
15	J. D. Foley, A. V. Dam, S. K. Feiner and J. F. Hughes. (1995). “Computer Graphics: Principles and Practices in C,” Addison Wesley.
16	“Game Programming Gems (Series from 1 to 8),” Charles River Media.
17	Gregory Pierce (2012). “Unity iOS Game Development Beginners Guide”. Packt Publishing
18	Pygame: http://www.pygame.org

Additional Readings

	Title
1	Unity Game Engine: http://unity3d.com
2	Gamasutra - http://www.gamasutra.com
3	Microsoft DirectX Developer Center: http://msdn.microsoft.com/directx/