Course Specification

(Bachelor)

Course Title:	2D Game Programming
Course Code:	HCI4807
Program:	BSc in Human Computer Interaction
Department:	Software Engineering
College:	Computing
Institution:	Umm Al Qura University
Version:	1.0
Last Revision Date:	22/04/2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☒ Elective		
3. Level/year at which this course is offered: (3rd year/ 6th level) or (4th year/8th level)					
4. Course General Description:					
This course provides a comprehensive introduction to the fundamentals of 2D game programming, equipping students with the technical skills needed to design and develop engaging 2D games. Students will explore game development frameworks, sprite-based animations, collision detection, physics, level design, and user input handling. The course emphasizes creating interactive experiences that align with principles of Human-Computer Interaction (HCI), focusing on player engagement, usability, and responsive gameplay. Using industry-standard tools like Unity, GameMaker Studio, and frameworks such as Python's Pygame, students will develop hands-on expertise in building 2D games, from conceptualization to deployment.					
5. Pre-requirements for this course (if any)**:**					
None					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
1. Learn essential concepts such as sprite-based animations, collision detection, physics, level design, and user input handling. 2. Design engaging, user-friendly, and responsive gameplay experiences that prioritize player engagement and usability. 3. Gain proficiency in industry-standard tools like Unity, GameMaker Studio, and Python's Pygame for designing and deploying 2D games. 4. Build and refine interactive 2D games through iterative development, emphasizing creativity, functionality, and professional standards.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		

No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	30
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Understand the core components of 2D game development, including rendering, physics, and animation.	K1	Lectures, discussions	Assignments, Exams
2.0	**Skills**			
2.1	Utilize game development frameworks (Unity, GameMaker, or Pygame) to create 2D games.	S1	Lectures, discussions	Exams, project
2.2	Implement sprite-based animations, parallax scrolling, and interactive environments.	S2	Lectures, discussions	Exams, project
2.3	Develop complete 2D games from concept to playable prototypes, including level design.	S3	Lectures, discussions	Exams, project

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to 2D Game Development and environment setup	3
2.	Game Loops and Rendering	3
3.	User Input Handling	3
4.	Sprite-Based Animation	3
5.	Physics and Collision Detection Algorithms	3
6.	Game Mechanics and Interactivity	3
7.	Level Design	3
8.	Parallax Scrolling and Backgrounds	3
9.	User Interfaces in 2D Games	3
10.	Sound and Visual Effects	3
11.	Optimization Techniques	3
12.	Multiplayer and Networking Basics	3
13.	Testing and Debugging	3
14.	Tools and Frameworks (e.g Unity)	6
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	3-14	10
2.	Project	3-14	30
3.	Midterm	7-8	20
4.	Final Exam	16-17	40

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	**J.Halpern, 2018 ,Developing 2D Games with Unity: Independent Game Programming with C#, Apress; 1st ed. edition**
Supportive References	
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Traditional Classroom
Technology equipment (projector, smart board, software)	Multimedia Projector
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct: Survey at the end of the course
Effectiveness of Students assessment	Instructor and quality assurance committee	Indirect: Course Report
Quality of learning resources	Instructor and quality assurance committee	Direct: Survey at the end of the course
The extent to which CLOs have been achieved	Instructor and quality assurance committee	Indirect: Course Report
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**SOFTWARE ENGINEERING DEPARTMENT COUNCIL**
REFERENCE NO.	**THE 17TH MEETING FOR THE ACADEMIC YEAR 1446H**
DATE	**22/04/2025**