SH. A.
أكاديمـيــة الشروق

المعهد العالى للحاسبات وتكنولوجيا المعلومات
مدينة الشروق ـ القاهرة
شعبة علوم الحاسب

Course specification

Course Code: CS 313

Course Title: Game Programming

Academic Year: /

Course specification
(CS 313 – Game Design & Development)

Course Outline	
Faculty:	HICIT- *(Higher Institute for Computers & Information Technology-El Shorouk Academy)*
Programme(s) on which the course is given:	Undergraduate program in Computer Science
Major or minor element of programme:	Compulsory
Department offering the program	Department of Computer Science
Department offering the course:	Department of Computer Science
Level	Third Level
Date of specification approval	DD/MM/YYYY

Basic Information			
Code: CS 313		*Title:*	Game Design & Development
Prerequisites:		*CS 312* Analysis of Algorithms	
Weekly Hours:			
Lecture: 2	**Exercise: -**	**Practical :** 2	**Total: 2** credit hours

Professional Information

Course Aims: This course focuses on the subject of game programming using a cross-platform game library called Allegro. This library is extremely powerful and versatile. The course is divided into 3 main parts. The first part introduces how to get started writing cross-platform games with Allegro. The second part provides the main functions in the Allegro game library, including functions for loading images, manipulating sprites, double-buffering, and other core features of any game. The third part introduces the different techniques to create scrolling games including vertical and horizontal scrolling.

After completing this course students must be able to:
  - Build and manipulate with classes.
  - using objects.
  - Implement the inheritance and polymorphism concepts.

Program ILOs Covered by Course			
Knowledge and understanding	**Intellectual Skills**	**Professional and practical skills**	**General and Transferable skills**
A2, A11, A13, A20	B3, B4	C1, C5, C10, C16	D5

a2	Deep understanding the concepts of the different high-level programming languages.
a11	Select advanced topics to provide a deeper understanding of some aspects of object-oriented analysis and design, and software engineering.
a13	Demonstrate strong knowledge of fundamentals of programming and the construction of computer-based systems.
a20	Describe the principals of generating tests which investigate the functionality of computer programs and computer systems and evaluating their results.
b3	Perform classifications of (data, results, methods, techniques, algorithms, etc.).
b4	Identify attributes, components, relationships, patterns, main ideas, and errors.
c1	Use appropriate programming languages and design methodologies.
c5	Specify, design, and implement and manage computer-based systems.
c10	Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems.
c16	Apply tools and techniques for the design and development of applications.
d5	Demonstrate efficient IT capabilities.

Intended learning outcomes of course (ILOs)

a. Knowledge and Under-Standing:

Upon successful completion of this course, graduates should be able to:

    a1- Understand and apply a wide range of principles and tools available to the object oriented Programming.

    a2- Defining classes and Using objects.

    a3- Know and understand the fundamental concepts, principles and theories of a class, object, polymorphism, and inheritance.

    a4- Implement the concepts of inheritance and polymorphism.

    a5- Implement the Abstract classes, Interfaces and OO Model.

b. Intellectual Skills:

Upon successful completion of this course, graduates should be able to:

    b1-Think in object-oriented programs.

    b2-Build independent modules (classes and objects) that can be used in different programs.

c. Professional and practical skills

    c1- Implement and develop an object-oriented program efficiently.

    c2- reuse the classes that were built during his practical work in computer lab to develop a bigger project.

    c3- use a range of software development tools (e.g. text editor and compiler).

    c4- Use features of an object-oriented programming language (e.g. inheritance, polymorphism to write programs).

    c5- Design appropriate interfaces between modular components.

d. General and transferable skills

    d1- Learn some Internet/Library searching strategies.

    d2- write a short report using appropriate scientific language.

    d3. Use IT skills and display mature computer literacy.

Contents

Topic	Contact Hours	
	lecture	Lab
Introduction to the Class, Role of the Game programming	2	2
Getting Started with the Game libraries	2	2
I/O and Arithmetic	2	2
Writing an Allegro Game	2	2
Getting Input from the Player	2	2
Mastering the Audible Realm	2	2
Basic Bitmap Handling and Blitting	2	2
Sprite Programming	2	2
<mark>Mid Term Exam</mark>		
Sprite Programming-II	2	2
Advanced Sprite Programming	2	2
Programming the Perfect Game Loop	2	2
Project presentation	2	2
<mark>Final Exam</mark>		

Teaching and learning methods

Teaching and learning methods	Used
Lectures	√
Tutorial Exercises	√
Practical Lab	√
Discussions.	√
Self – Learning (Reading material, Websites search,)	√
Self-studies	√
Group work	√
Presentation	√
Problem solving/problem solving learning based	√
Case study	√
Synchronous E-Learning	√
Video lectures	√
Asynchronous E-Learning	√

Student assessment methods & Schedule

Methods	Used	Week#
Midterm Exam	√	8

Final Exam	√	**16**
Course Project	√	**3-14**
Course Work & Quizzes	√	**2-14**
Practical Exam	√	**15**

Assessment Weight

Assessment	Weight %
Mid Term Exam	15%
Final Exam	60%
Course Project	10%
Course Work &Quizzes	15%
Practical Exam	100%

Course Work &Quizzes

Short Exams, Assignments, Research, Reports, Presentations
Class/Project discussion

List of references

Essential books (textbooks)	Jonathan S. Harbour, Game Programming All in one, Thomson Course Technology, last edition. ISBN -13 978-1598632897
Course notes	An Electronic form of the Course Notes and all the slides of the Lectures is available on the Students Learning Management System (Moodle)
Recommended books	
Periodicals, website	www.ekb.eg
Videos link	

Required Facilities

Tools & SW (Technology facilities):	– Unity – Microsoft Visual Studio – Microsoft TEAMS to create virtual classrooms for lectures, discussions for project. – Academy Portal (MOODLE) to make electronic quizzes and electronic midterm exam.

Teaching facilities:		
	Whiteboard	√
	Computer Lab	√
	Data show	√
	E-Learning	√
	Videos	√
	Website	√

Note above table:
- Academy Portal (MOODLE) to upload project deliverable and assignment.
- Academy portal (MOODLE) to upload electronic material.

Course Content/ILO Matrix

Course Contents	Knowledge & understanding					Intellectual skills		Professional and practical skills					General		
	a1	a2	a3	a4	a5	b1	b2	c1	c2	c3	c4	C5	d1	d2	d3
Introduction to the Class, Role of the Game programming	√														
Getting Started with the Game libraries		√													
I/O and Arithmetic		√	√												
Writing an Allegro Game				√											
Getting Input from the Player				√		√	√		√	√					
Mastering the Audible Realm					√	√	√	√		√	√				
Basic Bitmap Handling and Blitting								√			√				
Sprite Programming				√						√					
Sprite Programming-II				√						√					
Advanced Sprite Programming							√				√				
Programming the Perfect Game Loop				√					√	√					
Project presentation											√		√	√	

Learning Method /ILOs Matrix

Learning Methods	Knowledge and understanding					Intellectual skills		Professional and practical skills					General		
	a1	a2	a3	a4	A5	b1	b2	c1	c2	c3	c4	C5	d1	d2	d3
Lectures	√	√	√	√	√	√	√	√	√	√	√	√			
Tutorial Exercises						√	√	√	√	√	√				

	a1	a2	a3	a4	a5	b1	b2	c1	c2	c3	c4	C5	d1	d2	d3
Practical Lab					√		√	√	√	√	√				
Discussions.							√	√	√	√			√	√	√

Assessment Methods /ILOs Matrix

Assessment Methods	Knowledge & understanding					Intellectual skills		Professional & practical skills					General		
	a1	a2	a3	a4	a5	b1	b2	c1	c2	c3	c4	C5	d1	d2	d3
Mid Term Exam	√	√	√	√	√	√	√	√	√	√	√				
Final Exam	√	√	√	√	√	√	√								
Course Project	√	√	√	√	√	√	√	√	√	√	√		√	√	√
Course Work &Quizzes	√	√	√	√	√	√	√	√	√	√	√		√	√	√
Practical Exam	√	√	√	√	√	√	√	√	√	√	√				

Course ILOs Vs Program ILOs

Prog ILOs / Course ILOs		Knowledge & understanding				Intellectual skills		Professional and practical skills				General
		A2	A11	A13	A20	B3	B4	C1	C5	C10	C16	D5
Knowledge and Understanding	a1	√										
	a2	√	√	√	√							
	a3	√	√		√							
	a4		√		√							
	a5			√	√							
Intellectual skills	b1					√	√					
	b2											
Professional and practical skills	c1							√	√	√	√	
	c2							√	√	√		
	c3								√	√		
	c4							√	√	√	√	
	c5							√	√	√	√	
General skills	d1											√
	d2											√
	d3											√

Course Coordinator   : Dr. Eng. Mohamed A. Hussein **(   )**
Head of Department : Dr. Ahmed El-Abbassy   **(   )**
Date: 3/9/2023