COURSE SYLLABUS

Course Title	**Course Code**	**Semester**	**Course Hour/Week**		**Credit**	**ECTS**
Game Coding I	GAME303	6	**Theory** 2	**Practice** 2	3	5
Course Type	Compulsory Course	Department Elective	Faculty Elective	University Elective	CoHE (YÖK) Elective	Other
	Yes					
Level of Course	Associate Degree (Short Cycle)		Undergraduate (First Cycle)		Graduate/ Doctoral (Second /Third Cycle)	
	-		Yes		-	

Language of Instruction	English

Course Instructor(s)	Dr. Masoud Moradi	E-mail : masoud.moradi@arucad.edu.tr Office : TI-OFF18
Course Objectives	The course objectives encompass the following formal directives: To instill proficiency in programming skills within the C# language, covering the following essential topics: • Objects and classes • Inheritance and interfaces • Enums and collections • Exception handling • Game specific workflows To cultivate a practical working expertise in the utilization of the Unity game engine, specifically within the context of the C# programming language	

Course Learning Outcomes	**Students will able to:**	**Teaching Methods**	**Evalutation Methods**

	Understand C# basic syntax, variables, and data types. - Identify C# fundamental components and use them in code. - Explain the purpose of different data types.	- Lectures - In-class coding exercises	- Midterm Exam - Final Exam - Class Participation
	Create basic 2D games in Unity	- Lectures - Practice labs - Small projects	- Midterm Exam - Final Exam - Project Work
	Implement functions and modular programming techniques. - Define and call functions. - Organize code into reusable modules.	- Lectures - Lab sessions - Guided coding tasks	- Midterm Exam - Final Exam
	Apply problem-solving techniques to programming challenges	- Lectures - Exercises	- Midterm Exam - Class Assignments - Final Exam
	Create a complete 2D Unity game demonstrating all learned concepts	- Lectures - In-class demonstrations	- Assignments - Final Exam
Course Content	By the end of this course, students will be able to: 1. Understand fundamental programming concepts and computer organization 2. Write well-structured, properly commented C# programs 3. Use appropriate data types for different programming scenarios 4. Work with classes and objects (using existing classes) 5. Manipulate strings and process user input 6. Create basic 2D games in Unity 7. Implement conditional logic using if-else and switch statements 8. Handle user input from mouse, keyboard, and gamepads 9. Work with arrays and lists to manage collections of data 10. Use for and foreach loops to iterate through data 11. Integrate C# programming with Unity game development 12. Debug and test programs effectively 13. Apply problem-solving techniques to programming challenges		

COURSE OUTLINE/SCHEDULE			
Week	**Topic**	**Implementation (theory/practice)**	**Required Reading, Preliminary preparation**
1	Course description and Introduction	T	Instructor Notes
2	**Introduction Starting to Code - Program Structure** • What is programming? • Hardware organization (CPU, Memory, Input/Output devices) • Computer software concepts • Compiled vs. interpreted languages • The C# compilation process (CIL and CLR) • Setting up the development environment (Visual Studio) • Writing and running your first C# program	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
3	**Variables, Console Output, and Problem Solving** • Variables and constants • Console output (Console.WriteLine and Console.Write) • Curly braces and code blocks • Code style and formatting • Solving problems one step at a time • Sequence control structure • Testing sequence control structures • Adding a Unity script (introduction)	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
4	**Data Types - Characters, Booleans, and Operations** • Character data type (char)	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development: from concept to playable game with Unity and C#,

	• Boolean data type (bool) • Arithmetic operations (+, -, *, /, %) • Choosing between variables and constants • Giving variables a value (assignment) • Type conversions (implicit and explicit casting) • What about reference types?		3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
5	**Classes and Objects (Part 1)** • Introduction to classes and objects • Understanding object-oriented concepts (without OOP) • Your first C# program revisited • Calling methods on objects • The dot operator • Creating objects with the new keyword • Reference types in memory	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development: from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
6	**Classes and Objects (part2)** • The Circle problem (using classes) • Working with Unity game objects • The Circle problem in Unity • Practical applications of classes and objects • Common mistakes when working with objects	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
7	**MIDTERM**	**Midterm**	
8	**Strings and Input** • The String class and its methods • String manipulation (Substring, IndexOf, Length, etc.) • String concatenation and formatting • The StringBuilder class • Getting user input (Console.ReadLine)	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)

	• Converting string input to other types • String immutability		
9	**Unity 2D Basics** • Introduction to Unity 2D game development • The Unity editor interface • GameObjects and Components • Sprites and 2D graphics • Prefabs (reusable game objects) • Unity Circles revisited • Building simple 2D games	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
10	**Selection (Part 1)** • Selection control structure • Boolean expressions and relational operators • If statements (syntax and semantics) • If-else statements • Nested if statements • Testing selection control structures • Logical operators (&&, ||, !)	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
11	**Selection - Switch Statements and Timers(part2)** • The Input Manager in Unity • Mouse input (position, buttons) • Screen coordinates vs. world coordinates • Keyboard input (GetKeyDown, GetKey, GetKeyUp) • Gamepad input basics • Responding to player input in games.	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
12	**Unity Input - Mouse and Keyboard** • The Input Manager in Unity • Mouse input (position, buttons) • Screen coordinates vs. world coordinates	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN:

	• Keyboard input (GetKeyDown, GetKey, GetKeyUp) • Gamepad input basics • Responding to player input in games.		9780136619949 (Library Catalogue Number: QA76.76.C672)
13	**Arrays and Lists** • Introduction to arrays • Declaring and creating array objects • Accessing elements of the array • Array indices and bounds • Arrays of objects • Arrays of Unity GameObjects • Multi-dimensional arrays (2D arrays)	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
14	**Arrays and Lists** • Introduction to Lists (List<T>) • Lists vs. Arrays (when to use each) • Adding and removing elements from lists • List methods and properties • Refactoring code to use lists • The Card class example • Common mistakes with arrays and lists	T/P	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
15	Final Exam		

Required Course Material(s) / Reading(s)/ Text Book(s)	Gibson Bond, Jeremy. Introduction to game design, prototyping, and development : from concept to playable game with Unity and C#, 3rd edition, Boston: Addison-Wesley, 2023. ISBN: 9780136619949 (Library Catalogue Number: QA76.76.C672)
Recommended Course Material(s)/ Reading(s) /Other	• Unity Learn tutorials • C# exercises on HackerRank and LeetCode • Microsoft C# documentation

	Students should bring their storage devices. i.e.: USB Flash Drive

ASSESSMENT		
Learning Activities	**NUMBER**	**WEIGHT in %**
Mid-Term	1	40
Quiz		
Assignment	1	20
Project		
Field Study		
Presentation / Seminar		
Studio Practice		
Other		
Contribution of Final Examination/Final Project/ Dissertation to the Final Grade	1	40
TOTAL		100

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME LEARNING OUTCOMES						
No	PROGRAMME LEARNING OUTCOMES	Level of Contribution (1-lowest/ 5-highest)				
		1	2	3	4	5
1	Knows the historical development of the field of communication, basic concepts, theories.	✓				
2	Knows the basic concepts and terminology related to the field of game design.			✓		
3	Has knowledge about the history of computer and video games and developments in this field.		✓			
4	Knows game design processes and related applications.					✓
5	Has the ability to utilize various disciplines such as communication, art, music, psychology, mythology, cinema, etc. in the game design process.			✓		

6	Has the ability to analyze analog and digital game genres.				✓	
7	Has the ability to use contemporary game engines and problem solving skills.					✓
8	Has the knowledge of questioning the game designs with an analytic and critical perspective.				✓	
9	Has knowledge about media literacy.	✓				
10	Has the competence to prepare projects based on ethical principles in game development processes.			✓		
11	Has the competence to evaluate games as an art form.					✓
12	Has the competence to use game design concepts and methods in related fields such as design, software development and media.					✓
13	Has the competence to take part and responsibility in game development teams.					✓
14	Has the competence to collect, analyze and interpret analytical data about games and players.				✓	
15	Has the competence to develop and present a digital game project by using game design practices effectively.					✓
16	Evaluates artificial intelligence applications in their studies with a critical approach in terms of aesthetics and originality, and uses them in accordance with ethical rules.			✓		

ECTS / STUDENT WORKLOAD				
ACTIVITIES	**NUMBER**	**UNIT**	**HOUR**	**TOTAL (WORKLOAD)**
Course Teaching Hour (X weeks * total course hours)	14		3	42
Preliminary Preparation and self- study				
Mid-Term	1		20	20
Quiz				
Assignment	1		20	20
Project				
Field Study				
Presentation / Seminar				

Studio Practice				
Final Examination/ Final Project/ Dissertation	1		50	132
Other				
TOTAL WORKLOAD				132
TOTAL WORKLOAD / 25				5.28
ECTS				5

	SDG 1: No Poverty	×
	SDG 2: Zero Hunger	×
	SDG 3: Good Health and Well-Being	×
	SDG 4: Quality Education	√
	SDG 5: Gender Equality	×
	SDG 6: Clean Water and Sanitation	×
	SDG 7: Affordable and Clean Energy	×
	SDG 8: Decent Work and Economic Growth	×
	SDG 9: Industry, Innovation and Infrastructure	√
	SDG 10: Reduced Inequalities	×
	SDG 11: Sustainable Cities and Communities	×
	SDG 12: Responsible Consumption and Production	×
	SDG 13: Climate Action	×
	SDG 14: Life Below Water	×
	SDG 15: Life on Land	×
	SDG 16:Peace, Justice and Strong Institutions	×

	SDG 17:Partnership for the Goals	×

ETHICAL RULES WITH REGARD TO THE COURSE
Plagiarism Disclaimer Detected and undetected plagiarism is a serious offence at any time and it could have devastating effects on your degree result and future professional life. Plagiarism is easy to avoid if you make sure you thoroughly identify and recognize your sources and do not copy from visual examples, designs or notes taken directly from your sources word for word. The maximum citation limit cannot exceed 20%. Artificial intelligence citations are also considered within this scope. If proven otherwise, the student will fail the course.

ASSESSMENT DETAILS AND EVALUATION CRITERIA:	
Final Grades will be determined according to the Course Learning Activities and Final Examination/ Project/ Dissertation Assessment Details as below, and comply with the Education and Examination Regulation set forth by the University. Throughout the course, students will learn the theoretical base of the topic and they will be able to equip themselves with the practical know-how skills of Advertisement production. Also, students are expected to design a creative advertisement piece with the knowledge they have gained in the course. During the class sessions, participation is a very important input for the learning process for the students. It is also vital to understand the effect of creativity input on the production process of advertisement. 70% attendance to courses is compulsory. Health reports belong to 30% absenteeism right.	
PREPARED BY	Dr. Masoud Moradi

UPDATED	14.10.2025
APPROVED	