

COURSE SYLLABUS

Course Title	Course Code	Semester	Course Hour/Week		Credit	ECTS
			Theory	Practice		
Computer Networks	GAME316	6	2	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
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Course Instructor(s)	Dr. Masoud Moradi	E-mail : masoud.moradi@arucad.edu.tr Office : TI-OFF18
Course Objectives	<p>The objective of this course is to provide students with an understanding of computer networks and their application in game design, focusing on:</p> <ul style="list-style-type: none"> • Fundamentals of computer networks and data transmission Network topologies, protocols, and layered models (OSI, TCP/IP) • Networking hardware and infrastructure relevant to gaming • Practical network technologies for online and multiplayer gaming • Latency, synchronization, and performance optimization in games • Network security and safe online gaming practices • Emerging technologies in gaming networks • Ethical considerations and responsibilities in using data, with respect for privacy and accuracy • Network simulation using Cisco Packet Tracer • Thinking critically about how networking affects the gaming world and applying these skills to game development 	

Course Learning Outcomes	Students will able to:	Teaching Methods	Evaluation Methods
	Explain fundamental networking concepts including network types, topologies, and data transmission relevant to games.	- Lectures - In-class exercises	- Midterm Exam - Quiz
	Analyze network protocols and layered models (OSI, TCP/IP, TCP vs. UDP) and evaluate their impact on online gameplay	- Lectures - Practice labs - Demonstrations	- Midterm Exam - Final Exam - Quiz
	Use network simulation tools such as Cisco Packet Tracer to build and test simple network configurations.	- Lectures - Lab sessions - Guided practice tasks	- Midterm Exam - Final Exam
	Evaluate latency, synchronization and optimization techniques for online and multiplayer game architectures.	- Lectures - Exercises	- Midterm Exam - Final Exam
	Apply network security principles and ethical data practices emphasizing privacy, accuracy, and responsible data usage in gaming.	- Lectures - In-class demonstrations	- Quiz - Final Exam
	Course Content	<p>This course covers the following main areas:</p> <ol style="list-style-type: none"> 1. Fundamentals of computer networking and types of networks 2. Network topologies and protocols 3. Data transmission basics 4. Internet and network infrastructure 5. Networking hardware (routers, switches) relevant to gaming 6. Routing and switching techniques 7. OSI model vs. TCP/IP model 8. Physical layer and data link layer concepts 9. Transport layer protocols: TCP vs. UDP 10. Online gaming architecture: latency and synchronization 11. Network security and optimization in gaming 12. Practical network simulation with Cisco Packet Tracer 	

COURSE OUTLINE/SCHEDULE			
Week	Topic	Implementation (theory/practice)	Required Reading, Preliminary preparation
1	Introduction to Computer Networks: Basic Networking Concepts, Purposes, and Types of Networks	T	Instructor Notes
2	Network Topologies and Protocols: Understanding Different Network Topologies and Protocols	T/P	Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson.
3	Data Transmission Basics: Fundamentals of Data Transmission, Speed and Types	T/P	Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson.
4	Internet and Network Infrastructure: How the Internet Works, Components of Networks	T	Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson.
5	Networking Hardware: Overview of Routers, Switches and Other Hardware Relevant to Gaming	T	Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson.
6	Network Software and Interfaces; Routing and Switching: Unicast, Multicast and Anycast Routing; Distance Vector vs. Link State Routing; Switching Techniques (Circuit and Packet Switching)	T/P	Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson.
7	Understanding and Managing Latency and Synchronization; Wireless Networking	T/P	
8	Midterm Understanding and Managing Latency and Synchronization; Wireless Networking	Midterm	
9	Introduction to Cisco Packet Tracer; OSI Model vs. TCP/IP Model	T	Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson.

10	Physical Layer Fundamentals: Signal Propagation and Encoding; Physical Media Types (Twisted Pair, Coaxial, Optical Fiber, Wireless); Transmission Modes; Multiplexing Techniques (TDM, FDM, WDM, CDMA)	T	Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson.
11	Data Link Layer Concepts: Framing and Addressing; Error Detection and Correction (Parity Check, CRC); MAC Protocols (CSMA/CD, CSMA/CA)	T/P	Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson.
12	Transport Layer Protocols: TCP vs. UDP; Application Layer Protocols	T	Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson.
13	Network Security Fundamentals; Wireless Networking	T	Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson.
14	Course Revision	T/P	
15	Course Review	T/P	
16	Final Exam		

Required Course Material(s) / Reading(s)/ Text Book(s)	Optimising the Internet: Key topics in modern network algorithms by Vic Grout Call number: QA76.754 .G76 2007 Kurose, J. F., & Ross, K. W. (2017). Computer Networking: A Top-Down Approach (7th ed.). Pearson. Call number: QA76.754 .G768 2007
Recommended Course Material(s)/ Reading(s) /Other	<ul style="list-style-type: none"> Glazer, J., & Madhav, S. (2015). Multiplayer Game Programming: Architecting Networked Games. Addison-Wesley Professional. Armitage, G., Claypool, M., & Branch, P. (2006). Networking and Online Games: Understanding and Engineering Multiplayer Internet Games. John Wiley & Sons.

	<ul style="list-style-type: none"> • Cisco Packet Tracer tutorials and documentation <p>Students should bring their storage devices. i.e.: USB Flash Drive</p>
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ASSESSMENT		
Learning Activities	NUMBER	WEIGHT in %
Mid-Term	1	35
Quiz	1	25
Assignment	-	-
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		25	25
Quiz	1		15	15
Assignment	-		-	-
Project				

Field Study				
Presentation / Seminar				
Studio Practice				
Final Examination/ Final Project/ Dissertation	1		48	48
Other				
TOTAL WORKLOAD				130
TOTAL WORKLOAD / 25				5.2
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 computer networks and they will be able to equip themselves with the practical know-how skills of network technologies for online and multiplayer gaming. Also, students are expected to apply networking concepts to game-related scenarios 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 networking concepts on the design and performance of online and multiplayer games.

70% attendance to courses is compulsory. Health reports belong to 30% absenteeism right.

PREPARED BY	Dr. Masoud Moradi
UPDATED	26.02.2024
APPROVED	