



T.C.

ESKİŞEHİR OSMANGAZİ ÜNİVERSİTESİ

FACULTY OF SCIENCES

MATHEMATICS AND COMPUTER SCIENCES DEPARTMENT



## COURSE INFORMATION FORM

Course Name	Course Code
Computer Architecture	821613004

Semester	Number of Course Hours per Week		Credit	ECTS
	Theory	Practice		
3	3	0		5

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
	X			

Course Language	Course Level	Course Type
Turkish	Undergraduate	Compulsory

<b>Prerequisite(s) if any</b>	None
<b>Objectives of the Course</b>	To understand the structure, function and characteristics of computer systems To understand the design of the various functional units of digital computers Binary, Octal, and Hexadecimal number systems. To learn basics of Boolean Logic and Applications
<b>Short Course Content</b>	Computer arithmetic, CPU concepts, instruction fetching and decoding, CISC and RISC Structures, main memory, I/O organization, CPU instruction sets and addressing modes

Learning Outcomes of the Course		Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Understanding Computer Arithmetic, Binary, and Hexadecimal Number Systems: Gaining knowledge about computer arithmetic, as well as binary and hexadecimal number systems.	1, 2	1, 5	A
2	Understanding Von Neumann Architecture: Gaining knowledge about the Von Neumann architecture.	1, 4,	1, 10	A
3	Understanding Functional Units of the Processor, Such as Register File and Arithmetic Logic Unit: Gaining knowledge about functional units of the processor, including the register file and arithmetic logic unit.	3, 4	1, 6	A
4	Understanding Cost-Performance Issues and Design Trade-offs in Processor Design and Construction, Including Memory: Gaining knowledge about the cost-performance issues and design trade-offs in processor design and construction, including memory.	4, 5	1, 5	A
5	Understanding Quantitative Performance Evaluation of Computer Systems: Gaining knowledge about the quantitative performance evaluation of computer systems.	5, 6	1, 7	A

\*Teaching Methods 1:Expression, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Trouble/Problem Solving, 11:Individual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation

\*\*Measuring Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

6	Understanding the Cache Subsystem: Gaining knowledge about the cache subsystem.	6, 7	1, 5	A
7	Basic Knowledge of Digital Logic Circuit Design and Its Application to Computer Organization: Gaining basic knowledge of digital logic circuit design and its application to computer organization.	2, 3	1, 6, 10	A

<b>Main Textbook</b>	Computer Organization and Architecture: Principles of Structure and Function, Stallings, 1st edition. John Wiley and Sons, Inc. 1987. ISBN 0471202088
<b>Supporting References</b>	1) Lecture Notes
<b>Necessary Course Material</b>	

Course Schedule	
1	Introduction and a Brief History
2	Number Systems and Binary Codes
3	Fundamentals of Digital Systems
4	CPU Structure and Function
5	Instruction Sets
6	Control Unit Operation
7	Computer Interconnection Structures
8	Midterm
9	Internal and External Memory
10	Cache Memory and Cache Memory Mapping
11	Input / Output
12	Computer Arithmetic
13	Computer Arithmetic
14	Computer Arithmetic
15	Computer Arithmetic
16	Final Exam
17	Final Exam

Calculation of Course Workload			
Activities	Number	Time (Hour)	Total Workload (Hour)
Course Time (number of course hours per week)	14	3	42
Classroom Studying Time (review, reinforcing, prestudy,....)	14	3	42
Homework			
Quiz Exam			
Studying for Quiz Exam			
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			

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Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	20	20
Final Exam	1	2	2
Studying for Final Exam	1	30	30
	<b>Total workload</b>		<b>138</b>
	<b>Total workload / 30</b>		<b>4,6</b>
	<b>Course ECTS Credit</b>		<b>5</b>

Evaluation	
Activity Type	%
Mid-term	50
Quiz	
Homework	
Bir öge seçin.	
Bir öge seçin.	
<b>Final Exam</b>	50
<b>Total</b>	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	PROGRAM OUTCOME	Contribution
1	Ability to Apply Mathematical and Computer Science Knowledge: The ability to apply knowledge from mathematics and computer science.	2
2	Possession of International-Level Knowledge in Theory and Practice in Mathematics: Having sufficient knowledge in mathematics at an international level in both theory and practice.	1
3	Ability to Define, Model, and Solve Mathematical Problems in Mathematics and Related Fields: Ability to identify, model, and solve mathematical problems in mathematics and related fields.	1
4	Ability to Analyze and Design Problem Processes Towards a Defined Goal: The ability to analyze and design problem processes towards achieving a defined goal.	1
5	Ability to Analyze, Interpret, and Apply Data to Other Data and Implement This Knowledge in a Computer Environment: Ability to analyze, interpret, and apply data to other data and to implement this knowledge in a computer environment.	2
6	Ability to Use Contemporary Techniques and Computational Tools Necessary for Mathematical Applications: Ability to use contemporary techniques and computational tools required for mathematical applications.	1
7	Ability to Perform Interdisciplinary and Disciplinary Team Work: Ability to engage in both disciplinary and interdisciplinary team work.	1
8	Ability to Stay Informed and Develop Oneself by Following Advances in Mathematics, Computer Science, and Other Scientific, Technological, and Contemporary Topics: Ability to stay informed about and develop oneself by following advancements in	3

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	mathematics, computer science, and other scientific, technological, and contemporary topics.	
9	Ability to Communicate Ideas Clearly and Concisely, Both Verbally and in Writing, with Individual Work, Analytical Thinking, and Independent Decision-Making Skills: Ability to communicate ideas clearly and concisely both verbally and in writing, with individual work, analytical thinking, and independent decision-making skills.	1
10	Awareness of Professional and Ethical Responsibility: Awareness of professional and ethical responsibilities.	3
11	Awareness of Scientific Research and Quality Issues: Awareness of issues related to scientific research and quality.	3
12	Ability to Be Sensitive to Environmental Issues and Consistent in Social Relations: Ability to be sensitive to issues and development in one's environment and to maintain consistency in social relations.	1
13	Ability to Use Problem Solving and Mathematical Modeling to Develop Suitable Algorithms and Write Computer Programs: Ability to solve problems using problem-solving and mathematical modeling, and to write computer programs.	3
14	Design and Development Skills in Creating Software Systems of Varying Complexity Levels: Skills in designing and developing software systems of varying complexity levels.	1
15	Appreciation for the Necessity of Lifelong Learning and the Ability to Apply Lifelong Learning: Appreciation for the importance of lifelong learning and the ability to apply lifelong learning.	3

LECTURER(S)				
Prepared by	Doç. Dr. Özer Çelik			
Signature(s)				

Date:06.06.2024

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