MALTEPE UNIVERSITY
FACULTY OF ENGINEERING AND NATURAL SCIENCES
COMPUTER ENGINEERING (ENGLISH)
2018-2019 Spring Term

Course name: Computer Organization			Course code: CEN 221
ECTS: 7	2nd year - 4th semester	Undergraduate	Required
4 h/week	Lectures:2 h/week Application:2 h/week		Course language:English

Coordinator of the Course and contact info:

Assist. Prof. Dr. Serap CEKLİ (Spring)

Engineering Faculty Room No: 101-C,e-mail:serapcekli@maltepe.edu.tr,extension:2357

Section Code:

CEN 221 01, CEN 221 0101, CEN 221 0102

Office Hours:

Monday 09:00-10:00,10:00-11:00, Tuesday 14:00-15:00,15:00-16:00, Thursday 09:00-10:00,10:00-11:00, Friday 09:00-10:00,10:00-11:00,14:00-15:00,15:00-16:00

(If any) Web address of the course or the lecturer:

Lecturer of the Course and contact info:

Assist. Prof. Dr. Salih BAYAR (Spring)

,e-mail:salihbayar@maltepe.edu.tr,extension:

Section Code:

Office Hours:

Friday 11:00-12:00

(If any) Web address of the course or the lecturer:

www.salihbayar.com

Lecturer of the Course and contact info:

Assist. Prof. Dr. Serap CEKLİ (Spring)

Engineering Faculty Room No: 101-C,e-mail:serapcekli@maltepe.edu.tr,extension:2357

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(If any) Web address of the course or the lecturer:

Objectives of the Course:

Acquiring the basic knowledge about computer organization, processors, computer arithmetic, and pipelined datapath. Understanding the concept of machine instructions, the relationship between assembly language and machine language, machine representation of instructions (MIPS ISA). Understanding floating-point number systems and operations, simple data path and control designs.

Learning Outcomes and Subordinate Skills:

At the end of the semester the students will be able to:

1. Demonstrate programming abilities using the various addressing modes and data transfer instructions,
2. Understand the stack, the program counter, and the status register and also acquire the knowledge about the execution process of a machine code program,
3. Have knowledge of the processor and internal registers
4. Be familiar with the instruction set architecture and write assembly language programs,
5. Understand the arithmetic operation processes for the computer hardware,
6. Acquire the fundamentals and basics of pipelined datapath.

Generic Competencies:

1. Comprehension of the relationship between the hardware and software at a variety of levels. Acquiring the fundamental experience in assembly language and basic understanding of digital logic to conceive the basic computer organization. Apprehension of the ability to use a hierarchical (layered) approach to understand a complex system. This course provides the fundamentals concepts for the advanced year courses in the computer sciences.

Instructional Methods and Techniques:

Lecture, discussion, quentions-answeres, problem solving, laboratory sessions.

Mode of Delivery:

Face to face

Place of Special Course Internship (If any):

None.

Pre-requisites:

None.

Co-requisites:

None.

Recommended Optional Programme Components:

None.

Course Contents:

Comprehension of the relationship between the hardware and software at a variety of levels. Acquiring the fundamental experience in assembly language and basic understanding of digital logic to conceive the basic computer organization. Apprehension of the ability to use a hierarchical (layered) approach to understand a complex system. This course provides the fundamentals concepts for the advanced year courses in the computer sciences.

Course Category:

1.	Core Courses	X
2.	Major Area Courses	
3.	Supportive Courses	
4.	Transferable Skill Courses	
5.	Communication and Management Skills Courses	

Textbooks:

1. D.A.Patterson & J.L.Hennessy, ?Computer Organization & Design: The Hardware/Software Interface?, 4th edition, Morgan Kaufmann Pub., 2009.

Recommended Readings:

1. Alan W. Shaw, ?Logic Circuit Design?, Saunders College Publishing Series in Electrical Engi-neering, English, ISBN-10: 0030507936, ISBN-13: 978-0030507939.

Course Outline:

Weeks	Subjects to be Discussed / Covered
1 . Week	Computer abstractions and technology, language of hardware
2 . Week	CPU and instruction performance considerations, Instruction Set Architecture (ISA) concept
3 . Week	Operations and operands of the computer hardware
4 . Week	Logical operations, instructions for making decisions
5 . Week	MIPS addressing issues and related addressing modes
6 . Week	Translating and starting a program
7 . Week	Midterm Examination 1, Arrays and pointers and comparison between the methods
8 . Week	Bilgisayar donanımında icra edilen aritmetik işlemler için temel ilkeler, temel işlemler; toplama ve çıkarma işlemleri
9 . Week	Multiplication and division operations, and optimized versions of arithmetic hardware
10. Week	Floating point representation and arithmetic operations of floating point number, floating point instructions in MIPS
11. Week	The processor, logic design conventions
12. Week	Midterm Examination 2, Building of the datapath, and datapath components, creating a single datapath
13. Week	Implementation scheme of the design of the main datapath control unit and control signals.
14. Week	Pipelining fundamentals, comparison issues of single-cycle and pipelined datapath performance, instruction sets for pipelining
15. Week	Final Exam
16. Week	Final Exam

In Maltepe University, there is no general mid-term week for all courses. Each midterm for each course is given by the instructor of the course, by adding an extra week to the above 16 weeks course outline.

Evaluation System

Semester Requirements	Number	Percentage of grade
Attendance	-	-
Laboratory	14	30 (%)
Application	-	-
Field Work	-	-
Special Course Internship (If any)	-	-
Homework Assignments	-	-
Presentations	-	-
Project	-	-
Seminar	-	-
Quiz	-	-
Listening	-	-
Mid-Terms	1	30 (%)
Final	1	40 (%)
Total		**100**

ECTS Student Workload Table

Activities	Number	Duration (hours)	Workload
Course Hours (Including exam week 14x hours/week)	14	2	28
Laboratory	14	2	28
Application	-	-	-
Field Work	-	-	-
Special Course Internship (If any)	-	-	-
Study Hours-out of Class (pre/after studies)	14	4	56
Presentation / Seminar Preparation	-	-	-
Project	-	-	-
Homework Assignments	4	1	4
Quiz	-	-	-
Listening	-	-	-
Mid-Terms	1	30	30
Final	1	35	35
		Total Workload	**181**

Relationship Between Course Learning Outcomes and COMPUTER ENGINEERING (ENGLISH)(ENGLISH) Programme Key Learning Outcomes

No	Programme Key Learning Outcomes	1	2	3	4	5
1	Applies mathematics, science and engineering knowledge towards solving computer engineering problems.					X
2	Solves computer engineering problems by identifying the problem, and, determining the appropriate modeling and solution methods					X
3	Has the skills to design and develop computer engineering solutions to meet the requirements of various systems problems					X
4	The ability to use computer engineering tools and skills effectively					X
5	Gathers data, processes analyzes, and, reports the results.				X	
6	Follows the technological advances and the awareness for life-long learning.					X
7	Takes active and effective duties in team studies as well as interdisciplinary activities and shows leadership.	X				
8	Has the skills to have effective oral and written communication	X				
9	Has the skills to follow and utilize international publications		X			
10	Takes professional and ethical responsibilities			X		
11	Aware of real life applications and problems				X	
12	Understand the national and international level legal, social, and cultural and environmental effects of engineering applications.	X				