HASAN KALYONCU UNIVERSITY
Faculty of Engineering
Course Description Form

COURSE: Computer Architecture and Organization				
CODE: CENG202	**SEMESTER:** SPRING			
LANGUAGE: ENGLISH	**TYPE:** COMPULSORY			
PRE-REQUISITES: EEE243 **CO-REQUISITES:**	**THEORY**	**PRACTICAL**	**CREDIT**	**ECTS**
WEEKLY HOURS:	3	0	3	5

CONTENT OF THE COURSE:
This course provides an overview of computer organization and architecture. The major components of a computer and their interconnections. Computer arithmetic and logic. Internal architecture and organization of the processor. including a discussion of reduced instruction set computer (RISC) and superscalar approaches. Introduction to parallel computing.

OBJECTIVE OF THE COURSE:
This course is to teach students the topics of the structure and organization of computers. Its aim at presenting as clearly and completely as possible, the structure, nature and characteristics of modern-day computer systems. In particular, to know about

1. an instruction set and techniques of pipelining.
2. I/O subsystem and DMA
3. hierarchical memory subsystems like main memory, cach memory, external and internal memory
4. multiprocessing and concurrency concepts.

WEEKLY SCHEDULE	
Week	**Topics**
1	Introduction. Computer Evolution
2	Computer Function and Interconnection
3	Cach memory
4	Internal and external memory
5	Input and output
6	Computer arithmetic
7	Midterm I
8	Instruction Sets: Characteristics and Functions
9	Instruction Sets: Addressing Modes and Formats
10	Processor structure and piplining
11	Midterm II
12	Reduced instruction set computers
13	Instruction-Level Parallelism and Superscalar Processors
14	İntroduction to parallel procesing and multicore computer

TEXTBOOK: William Stallings, Computer Organisation and Architecture, 10th Edition, Prentice Hall, 2016
REFERENCE BOOKS: Tanenbaum AS, Structured Computer Organisation 6th Edition, Prentice Hall 2013

EVALUATION SYSTEM:		
IN-TERM STUDIES	**QUANTITY**	**PERCENTAGE (%)**
Midterm Exam	2	20
Homework	5	15
Laboratory works	13	20
Quiz	4	5
Final Exam	1	40
TOTAL	**25**	100
CONTRIBUTION OF INTERM STUDIES TO OVERALL GRADE	24	60
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	1	40
TOTAL	25	100

COURSE CATEGORY:	**PERCENTAGE (%)**
Mathematics and Basic Sciences	30
Engineering	30
Engineering Design	40
Social Sciences	0

TABLE OF ECTS / WORKLOAD:			
Activities	**QUANTITY**	**Duration (Hour)**	**Total Workload**
Course Duration	13	3	39
Hours for off-the-classroom study (Pre-study, practice)	14	6	84
Laboratory works	-	-	-
Mid-term	2	2	4
Final examination	1	2	2
Homework	5	3	15
Quiz	4	0.5	2
Total Work Load			**146**
Total Work Load / 30			**4.87**
ECTS Credit of the Course			**5**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
LO1	2	2	2	3	3	1	2	2	0	0	0
LO2	2	2	2	3	3	1	2	2	0	0	0
LO3	2	2	2	3	3	1	2	2	0	0	0
LO4	2	2	2	3	3	1	2	2	0	0	0
LO5	2	2	2	3	3	1	2	2	0	0	0
LO6	2	2	2	3	3	1	2	2	0	0	0
LO7	2	2	2	3	3	1	2	2	0	0	0
	PO: Program Outcomes | LO: Learning Outcomes Values: 0: None | 1: Low | 2: Medium | 3: High										

INSTRUCTOR(S):	Asst. Prof. Dr. Abdul Hafiz ABDULHAFIZ
FORM PREPARATION DATE:	22/05/2019

LEARNING OUTCOMES OF THE COURSE:	**PROGRAM OUTCOMES:**
LO1: To identify CISC and RISC processors and to write programmes on them **LO2:** To design pipeline and to evaluate the performance of pipeline **LO3:** To learn working principles of priority and nested interrupts and to design systems **LO4:** To learn Direct Memory Access (DMA) and to make applications on this systems **LO5:** To learn RAID **LO6:** To learn concepts of cache memory **LO7:** To learn concepts of virtual memory	**PO1:** Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied knowledge in these areas in complex engineering problems. **PO2:** Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose. **PO3:** Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose. **PO4:** Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively. **PO5:** Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions. **PO6:** Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually. **PO7:** Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign

	language; ability to write effective reports and comprehend written reports, prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions. **PO8:** Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself. **PO9:** Consciousness to behave according to ethical principles and professional and ethical responsibility; knowledge on standards used in engineering practice. **PO10:** Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development. **PO11:** Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.