HASAN KALYONCU UNIVERSITY
Faculty of Engineering
Course Description Form

COURSE: Digital Logic Design				
CODE: EE243	**SEMESTER :** FALL			
LANGUAGE: ENGLISH	**TYPE :** COMPULSORY			
PRE-REQUISITES: - **CO-REQUISITES:** -	**THEORY**	**PRACTICAL**	**CREDIT**	**ECTS**
WEEKLY HOURS :	3	2	4	6

CONTENT OF THE COURSE:
Dear students, welcome to digital logic design course. This course aims to provide the students with the necessary skills such as digital electronic circuit elements, drawing and analyzing logic diagrams, designing desired logic circuits, using hardware and software based modeling, using communication tools and designing, performing, analyzing and interpreting the experimental knowledge of the theoretical knowledge. The content, function, usage areas and working methods of the basic storage elements are explained. Evaluation of the course will be done with midterm, homework-laboratory and final exams.

OBJECTIVE OF THE COURSE:
To learn the necessary concepts for hardware of all systems from simple digital circuits to computer systems and gain the necessary hardware and design skills for digital analysis and digital circuit design.

WEEKLY SCHEDULE	
Week	**Topics**
1	Digital Logic Concept, Concepts of Analog and Digital
2	Number Systems 1 (Decimal Number System, Binary Number System)
3	Number Systems 2 (Octal Number System, Hexadecimal Number System)
4	Alphanumeric Number Systems, Digital Codes, Logic Gates
5	Accuracy tables, symbols, electrical equivalent circuits of logic gates
6	Digital integrated circuit (IC) structures and used techniques
7	Boolean Algebra and simplification of logic functions
8	Midterm examination
9	Karnaugh Maps, its structure and types
10	Simplification of logic functions with Karnaugh Maps method
11	Simplification of logic functions with List method, Half and Full Adders
12	Encoders, Decoders, Converters, Multiplexers, Demultiplexers
13	State tables, State Diagrams, Latches and Flip-Flops and register types
14	General Evaluation

TEXTBOOK: M. Morris MANO (2015), Digital Design 5th Ed. (ISBN: 978-0130621214), Pearson Pub. USA
REFERENCE BOOKS: - L. Thomas FLOYD (2011), Digital Fundamentals 10th Ed., Pearson Education, USA**,** Charles H. Rote (2016), - Fundamentals of Logic Design 7th. Ed. (ISBN: 978-0534954727), Cengage Learning., USA, - M..Morris Mano, C. KIME (2014), Logic and Computer

Design Fundamentals,4th Ed., Prentice Hall, 2008.

EVALUATION SYSTEM:		
IN-TERM STUDIES	**QUANTITY**	**PERCENTAGE (%)**
Midterm Exam	1	30
Homework	3	15
Laboratory works	13	15
Final Exam	1	40
TOTAL	**18**	100
CONTRIBUTION OF INTERM STUDIES TO OVERALL GRADE	17	60
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	1	40
TOTAL	**18**	100

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

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	13	2	26
Mid-term	1	1,5	1,5
Final examination	1	1,5	1,5
Homework	3	4	12
Total Work Load			**164**
Total Work Load / 30			**5,46**
ECTS Credit of the Course			**6**

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

INSTRUCTOR(S):	Asst. Prof. Dr. Ulaş GÜLEÇ
FORM PREPARATION DATE:	22.05.2019

LEARNING OUTCOMES OF THE COURSE:	**PROGRAM OUTCOMES:**
LO1: To understand the importance of digital systems in application and computer architecture **LO2:** To learn the number systems used in digital system **LO3:** To comprehend the basic theorems and axioms of Boolean algebra arithmetic **LO4:** To learn the function and architecture of basic logic gate elements **LO5:** To gain the ability of performing logic functions with basic logic gate circuits **LO6:** To learn the simplification of numerical functions with different techniques (Boolean Algebra, Karnaugh Map Method, List Method,…) **LO7:** To learn the internal structures and functions of basic storage elements	**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.