	Course name: EE413 - Digital VLSI System Design			**Department:** Electrical and Electronics Engineering				Semester
								8
	Methods of Education							Credit (ECTS)
	Lecture	Recitation/ (Etud)	Lab	Project/Field Study	Homework	Other	Total	5
	42		0	40	40	10	132	

Language	English
Compulsory/Elective	Elective
Prerequisites	None
Course Contents	Integrated circuits trends, Digital integrated circuits implementation methodologies, MOS devices theory, CMOS fabrication, Inverters and combinational circuits, Sequential circuits, Clocking and timing issues, Interconnect issues, Arithmetic and data path circuits, Memories and array circuits, Low power design, Packaging, power and I/O issues, Testing and design for testability, Design methodologies and tools, Full-custom IC design project
Course Objectives	To introduce the basics of CMOS digital integrated circuit layout and design.
Learning Outcomes and Competences	After taking this course, students will be able to understand: issues related to the development of digital integrated circuits including fabrication, circuit design, implementation methodologies, testing, design methodologies and tools.
Textbook and /or References	1. J. Rabaey, A. Chandrakasan, B. Nikolic, **"Digital Integrated Circuits: A Design Perspective"** 2nd Edition, Prentice Hall, ISBN 0131207644, January 2003. 2. H. E. Weste and D. Harris, **"CMOS VLSI Design: A Circuits and Systems Perspective", 4th** Edition**,** Addison-Wesley, ISBN 0-321-14901-7, May 2010. 3. W. Wolf, **"Modern VLSI Design: System-on-Chip Design",** 3rd Edition, Prentice Hall, ISBN 0-13-061970-1, 2002.

Assessment Criteria		If any, mark as (X)	Percentage (%)
	Midterm Exams	X	25
	Quizzes	X	10
	Homeworks	X	10
	Projects	X	25
	Term Paper		
	Laboratory work		
	Other		
	Final Exam	X	30

Instructors	Assist. Prof. Dr. Enver ÇAVUŞ
Week	**Subject**
1	Introduction
2	Basic MOS Theory, CMOS fabrication

3	Inverters
4	Combinational Logic Gates – Static and Dynamic CMOS
5	Combinational Logic Gates – Static and Dynamic CMOS
6	Sequential Circuits – Latches and Flip-Flops
7	Sequential Circuits – Counters and Sequential Machines
8	Timing and Interconnect Issues
9	**Mdi-Term**
10	Data Path Circuits
11	Memory and Array Circuits
12	Low Power Design
13	Design for Test
14	Design Methodologies and Tools
15	Design Project Presentations