GAU, Faculty of Engineering

Course Unit Title	Digital Design
Course Unit Code	ENG206
Type of Course Unit	Compulsory, Computer and EE engineering students
Level of Course Unit	2nd Year BSc
National Credits	4
Number of ECTS Credits Allocated	6 ECTS
Theoretical (hour/week)	3
Practice (hour/week)	-
Laboratory (hour/week)	2
Year of Study	2
Semester when the course unit is delivered	4
Mode of Delivery	Face to Face, Laboratory Experiments
Language of Instruction	English
Prerequisities and co-requisities	ENG205
Recommended Optional Programme Components	-

Objectives of the Course:

- Latches and Flip-Flops
- Clocked Sequential Circuits
- Synchronous and Asynchronous Counters
- Registers, Shift Registers

Learning Outcomes

When this course has been completed the student should be able to		Assesment.
1	Explain the latches and flip-flops	1
2	Analyze the clocked sequential circuits	1
3	Design clocked sequential circuits	1
4	Examine asynchronous counters and design synchronous counters	1
5	Conduct experiments and interpret obtained data	3,5

Assesment Methods: 1. Written Exam, 2. Assignment 3. Project/Report, 4.Presentation, 5 Lab. Work

Course's Contribution to Program

		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	4
2	Ability to design and conduct experiments as well as to analyze and interpret data	5
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	3
4	Ability to apply systems thinking in problem solving and system design	4
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	1
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	4
7	Ability to express their ideas and findings, in written and oral form	3
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	5
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate 4: High, 5:Very High)

Course Contents

Week		Topics	Exams
1	Chapter 4	Revision (Combinational Logic)	
2		Multiplexers	
3	Chapter 5	Introduction to Sequential Circuits	
4		Storage elements: Latches and Flip-Flops	
5		Analysis of Clocked Sequential Circuits	
6		"	Quiz 1
7		State Reduction and Assignment	
8			Midterm
9		Design Procedure of Clocked Sequential Circuits	
10		"	
11	Chapter 6	Registers	Quiz 2
12		Shift Registers	
13		Synchronous Counters	Quiz 3
14		Ripple Counters / other counters	Lab. Exam
15			Final

Recommended Sources

Textbook: Digital Design, M. Morris Mano and Michael D. Ciletti, Pearson Education, (4th Edition 2007) (Other editions are also useful)

Supplementary Material (s): Digital Fundamentals, Thomas L. Floyd, Prentice-Hall International, 1997

Assessment

Attendance	5%	
Laboratory	10%	
Midterm Exam (Written)	30%	
Quiz (Written)	15%	
Final Exam (Written)	40%	
Total	100%	

ECTS Allocated Based on the Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including the Exam week)	15	3	45
Labs and Tutorials	8	2	16
Assignments	-	-	-
Project/Presentation/Report Writing	8	2	16
E-learning Activities	-	-	
Quizzes	3	8	24
Midterm Examination	1	15	15
Final Examination	1	15	15
Self Study	14	3	42
Total Workload			173
Total Workload/30 (h)			5.77
ECTS Credit of the Course			6