Course Syllabus
CE-210 Digital Systems I

Instructor: Mohammad Ghamari
Office: 2-703U
Hours: Fridays or by appointment
Email: mghamari@kettering.edu
Phone: 810-762-7990
URL: Blackboard is used for posting course material and virtual class/lab

Course Description: This course provides the required theoretical and practical background to design of digital systems. Formal design and analysis techniques for combinational and sequential logic circuits are studied. Topics include binary number systems and binary addition/subtraction, combinational logic minimization, frequently used combinational logic circuits, finite state machines, shift registers and counters. VHDL will be used for description, simulation and FPGA synthesis of digital circuits.

Text Book:

Introduction to Digital Circuits, manuscript by Prof. Nozar Tabrizi

References:

Fundamentals of Digital Logic with VHDL Design, Stephen Brown and Zvonko Vranesic, 3rd edition, McGraw-Hill Companies, ISBN 0077221435.
Digital Design, with RTL Design, VHDL, and Verilog, 2nd edition, by Frank Vahid, ISBN 978-0-470-53108-2.

Tentative Course schedule:

Week	Topics	Homework (HW)	Labs	Exams
Week 1	Digital Circuits, Binary Numbers, Truth Tables, and Digital Gates	Posting Chapter 1 HW	Lab 1: Introduction to software and FPGA Board	
Week 2	Digital Gates continued; Switching Algebra	Due Chapter 1 HW; Posting Chapter 2 HW	Lab 2: Intro. To VHDL	
Week 3	Switching Algebra continued	Due Chapter 2 HW	Lab 3: Multiplexers	

Week 4	Canonical SOP & POS Logic Minimization using K-Map	Posting Chapter 3 HW	Lab 4: 7-Seg Decoder	Exam 1
Week 5	K-MAP continued; Frequently Used Digital Circuits	Due Chapter 3 HW; Posting Chapter 4 HW	Lab 5: Design of Digital Circuits - Structural Style	
Week 6	Frequently Used Digital Circuits Continued, Binary Number Systems and Arithmetic	Due Chapter 4 HW; Posting Chapter 6 HW	TBA	
Week 7	Arithmetic Circuits Continued for Combinational Circuits	Due Chapter 6 HW; Posting Chapter 5 HW	Lab 6: 4-bit Adder	Exam 2
Week 8	Signed number systems; Analysis of Sequential Circuits	Due Chapter 5 HW; Posting Chapter 7 HW	Lab 7: Design of Digital Circuits - Behavioral Style BCD adder Design	
Week 9	Analysis of Sequential Circuits Continued; Design of Sequential Circuits	Due Chapter 7 HW; Posting Chapter 8 HW	Lab 8: Simulation	Exam 3
Week 10	Design of Sequential Circuits continued; Frequently Used Sequential Circuits	Due Chapter 8 HW; Posting Chapter 9 HW	Lab 9: Sequential Circuits: Memory Cells	
Week 11	Frequently Used Sequential Circuits Continued; Possible Review session and Final exam			Final Exam

Performance Evaluation: Students will be evaluated through exams and homework/lab assignments. Students must write four exams and complete homework/lab assignments.

Grading: The overall grade for the course is calculated as follows:

Exams and quizzes	55%
Homework	20%
Laboratory	25% (70% Lab attendance/completion + 30% Questions)
	100%

The passing grade for this course is 60/100 and subject to achieve 60/100 or higher for the Exams and quizzes.

Attendance Policy:

You can participate in class in face-to-face or virtual sessions. The instructor must be notified in advance of late arrivals or absences. Each student is allowed to miss up to three lectures with the in-advance permission from instructor. No absence is permitted for lab and exam sessions.

Academic Assistance

In addition to your professors, academic assistance with class work and writing is available from the Academic Success Center (ASC) at (810) 762-7995 or academicsuccess@kettering.edu.

FAQ: How can I successfully complete this course?

Best answer: Follow the following instructions:

- Read the course notes before lectures
- Attend all lectures and be active in class
- Complete in-class exercises
- **Individually** do the homework assignments, then discuss your solutions with your classmates
- Compare your solutions with the posted solutions
- Do your best in exams
- Complete & submit lab assignments by deadlines
- Be active in lab sessions and practice your team working skills
- Complete lab assignments & submit by deadlines