The University of Jordan
School of Engineering
Computer Engineering Department

Academic Year:	2025 / 2026
Semester:	Fall
Course:	0907234 Digital Logic Lab 3 Credits / Dept. Obligatory
Catalog Description:	Introduction to digital logic design tools and hardware programmers. Experiments using simulation and practical implementation of the basic building blocks of a logic using Verilog including basic gates, Encoders, Decoders, Multiplexers. Demultiplexers, Latches, flip flops, registers and counters. In addition to a design project.
Prerequisite(s):	0907231 Digital Logic
Co-requisite(s):	None
Background:	Good background in digital logic concepts.
Textbooks:	• The lab manual with a set of experiments is posted on the lab website. • Logic and Computer Design Fundamentals, M. Morris Mano and Charles R. Kime, 5th edition, Prentice Hall, 2016..
References:	• Digital Design: Principles and Practices, Fourth Edition. John F. Wakerly. Prentice Hall, Upper Saddle River, NJ, 2006. • Altera DE2 Development and Education Board User Manual. • A Simple Design in VHDL Using Altera Quartus II 8 Web Edition.
Course Website:	Resources on Microsoft Teams
Schedule & Duration:	14 weeks, 12 sessions, 180 minutes each, including exams.
Student Material:	Textbook, Datasheets, lab handouts, some instructor keynotes, access to a personal computer and internet.
Facilities:	Lab with whiteboard, personal computers, Altera Quartus boards, , oscilloscopes and server.
Course Objectives:	• The objective of this course is to give hands-on experience on designing, implementing and testing of various logic circuits using discrete components and Verilog HDL.
Course Outcomes and Relation to ABET Program Outcomes:	Upon successful completion of this course, a student should be able to: • Build and realize basic logic functions from discrete integrated circuits using breadboards [**SO1**, **SO6**]. • Use modern synthesis tools to build and simulate schematic combinational and sequential logic circuits and deploy them on FPGAs [**SO1**, **SO6**]. • Use Verilog hardware descriptive language to build, simulate and synthesize decoders, encoders, multiplexors, arithmetic circuits, sequential circuits and

memory units using FPGAs [**SO1**, **SO6**].

- Work within a team to formulate, design and simulate a logic circuit based on a formal description [**SO1**, **SO2, SO5**].

Lab Schedule:

Week	Date	Activity/Experiment
1	05/10/25	Lab Syllabus and Introduction
2	12/10/25	Exp1. Introduction to Altera and schematic programming
3	19/10/25	Exp2. Introduction to Verilog programming
4	26/10/25	Exp3. Implementation Using Bread boards and Discrete Gates + Quiz
5	02/11/25	Exp4. Decoder/Encoder Applications
6	09/11/25	Exp5. Multiplexers/Demultiplexers Design and Implementation (Time Division Multiplexing)
7	16/11/25	Exp6. Arithmetic Circuits Design and Implementation & Project Assignment
8	23/11/25	Midterm
9	07/11/25	Exp7. Latches and Flip-Flops
10	14/12/25	Exp8. Registers and Counters
11	21/12/25	Open Lab (Project Preparation)
12	28/12/25	Project Discussions
13	12/01/26	Final Exam

Computer Usage: In-lab computers with Altera software.

Policies:

- Attendance is mandatory and will be recorded each class; university absence rules apply.
- All submitted work must be your own; cheating, plagiarism, unauthorized AI-generated work, or improper use of AI tools will result in academic penalties.
- Professional conduct, timely communication, and adherence to assessment schedules are expected throughout the course.

Assessment Tools & Grading:

☐ Midterm Exam (Theory)	0%	☒ Midterm Exam (Practical)	25%
☒ Final Exam	40%	☒ Quizzes	5%
☐ Assignments	0%	☒ In-Lab sheets	15%
☒ Projects	15%		
☐ Other:			

Instructor(s):

- Eng. Saadeh Sweidan (s.sweadan@ju.edu.jo)
- Eng. Abee Awad (a.awad@ju.edu.jo)
- Eng. Ola Aljalodi (o.jaloudy@ju.edu.jo)

Section(s):

- **Section 1**: Sunday 13:30 – 16:30
- **Section 2**: Monday 10:00 – 13:00
- **Section 4**: Tuesday 13:30 – 16:30
- **Section 5**: Wednesday 13:00 – 16:00
- **Section 6**: Thursday 13:30 – 16:30

Student Outcomes (SO)

SO1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

SO2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO3. An ability to communicate effectively with a range of audiences.

SO4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

SO5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

SO6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

SO7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Last modified: September 28, 2025