Course number: 04022270
Course name: Digital Logic Design Lab
Prerequisites by course: Logic Design
Prerequisites by topic: Students are assumed to have had sufficient background of the following topics: Boolean Algebra, Digital logic functions and circuits.
Credit hours: 1 hour
Contact hours: 3 hours
Textbook: [Lab Manual], [----], [----]
References:
Digital Design, Morris Mano, Latest Edition, Pearson
Course website: ---
Schedule and duration: 16 weeks, 16 Labs, 170 minutes each (including exams).
Minimum student material: Lab Manual, class handouts, some instructor keynotes, calculator and access to a personal computer and internet.
Minimum college facilities: Computer laboratory, library, and computational facilities.
Course objectives: The objectives of this course are:

1.	To analyse and understand data sheets and function tables for different logic ICs
2.	To improve the basic practical skills about connection and pin configuration
3.	Develop truth tables and coordinating Karnaugh maps for building different combinational circuits
4.	To practically implement and test logic devices behavior
5.	To be able to design sequential logic circuits and counters

Course outcomes and relation to ABET student outcomes: (matrix)
Upon successful completion of the course, a student should be able to:

Course Outcomes	Student Outcomes						
	SO 1	SO 2	SO 3	SO 4	SO 5	SO 6	SO 7
To realize numbering systems and being able to decode the binary inputs on a 7-segment display practically	*				*		
To experimentally understand DeMorgan's theorem and truth table determination for circuits with many input variables	*	*			*		
To understand, implement and test the architecture of Half adders, Full adders, decoders and multiplexers	*	*			*		
To understand different types of flip-flops (RS flip-flops, D flip-flops, JK Flip flops and T flip flops) and being able to design sequential circuits with several state diagrams	*	*			*		
To be able to implement Boolean functions and logic designs using decoders and multiplexers i.e. Full adder design using decoder and OR gates	*	*			*		
To be able to design and analyze Asynchronous counters with different sizes and different counting limits	*	*			*		

To be able to connect simple logic circuits using logic gates, expect and check the results correctly	*				*		

Course topics:

Practical considerations
Numbering Systems and Logic gates
Boolean Algebra and DeMorgan's Theorem
Combinational Logic Circuits
Arithmatic Unit (A.u.) Design (Half Adders (HA),and Full Adders (F.A))
Applications of Adders and Comparators
Decoders and Multiplexers
Applications of Decoders and Multiplexers
Synchronous Sequential Design and Asynchronous Counters

Computer usage: Multisim Software

Attendance: Class attendance will be taken every class and the university's policies will be enforced in this regard.

Assessments: Exams

Grading policy:

Participation	5%
Weekly Reports	15%
Midterm Exam	30%
Final Exam	50%

Instructors: Dr. Osama Fares email: osama.fares@iu.edu.jo

Class time and location: Tuesday 01:00 – 3:50 pm

Student Outcomes (SOs)

1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	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
3	An ability to communicate effectively with a range of audiences
4	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
5	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
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies