Course code and name	EE272-2: Digital Design
Credits units	2 Credit units
Contact hours	4 Contact hours: 1 lecture, 1 tutorial and 2 practical
Instructor name	Dr. Ghazi Ben Hmida
Textbook	Charles H. Roth Jr., Fundamentals of logic design, 4th edition. Thomas books, 2004, ISBN 0534378044.
Other supplemental materials	M. Mano, Digital Design, Prentice Hall Inc., 2002.
	Specific course information
a. Course description	This course teaches the students how to write numbers in any number system or code and convert between them, to determine the logic function from truth table and design the related combinational circuit, to analyze and design a logic circuit based on multiplexers and decoders and gates, to analyze and design shift and transfer registers based on flip-flops and gates and to analyze and design synchronous and asynchronous counters based on flip-flops and gates.
b. Prerequisite	CSC222-3
c. Required / Elective	Required
	Course Learning Outcomes

CLO of the Lecture Activities:

CLO1: Calculate a numeric data representation in various number systems and arithmetic operation of binary numbers.

CLO2: Develop competence in Combinational Logic Problem formulation to express and simplify logic expressions using the theorems of Boolean algebra and Karnaugh maps.

CLO3: Analyze and design combinational and sequential digital systems and use standard combinational and sequential digital building blocks including adders, comparators, multiplexers, decoders, encoders, laches and flip-flops.

CLO4: Analyze and design capability of synchronous and asynchronous sequential

circuit.

CLO of the Laboratory Activities:

CLO1: Verify theory and to improve knowledge learned in class.

CLO2: Formulate and solve problems related to theory.

CLO3: Design and safety conducts an experimental procedure.

CLO4: Independently perform accurate quantitative measurements, interpret experimental results, perform calculations on these results and draw a reasonable, accurate conclusion.

CLO5: Communicate critical analysis of scientific information through written reports.

CLO6: Be integrated inside a group of work and respect the team working.

Brief list of topics to be covered

- Represent numeric data in various number systems and add/subtract numbers using signed magnitude 1's complement and 2's complement. Construct circuits for Boolean functions using various logic gates.

- Boolean functions using various Boolean Algebra rules. Simplify Boolean functions of 2, 3 and 4 variables using Karnaugh maps in Sum of Product.

- Iterative Combinational systems for adders and construct adder/substrator and comparator circuits using logic gates.

- Types of decoders, encoders, multiplexer and de-multiplexer using logic gates.

- Sequential systems, state tables, latches, various flip flop circuits and timing diagrams for these flip flops.

- Sequential circuits using RS, D, T and JK- flip Flops.

- Asynchronous counters using various types of flip-flops.

Mapping Course Learning Outcomes to Student Outcomes

	Lecture Activities						
	SO1	SO2	SO3	SO4	SO5	SO6	SO7
CLO1							
CLO2							
CLO3							
CLO4							
	Laboratory Activities						

	SO1	SO2	SO3	SO4	SO5	SO6	SO7
CLO1							
CLO2							
CLO3							
CLO4							
CLO5							
CLO6							