

EE 112

1. **Course Number & Name:** EE 112 Fundamentals of Digital Logic Design
2. **Course Credit and Contact Hours:** 1 Unit, 3 hours
3. **Course Coordinator:** Dr. Sara Kassis
4. **Textbook:** Morris R. Mano and Michael D. Ciletti, *Digital Design – with an Introduction to the Verilog HDL*, 5th Edition, Pearson. ISBN 978-0132774208.
5. **Supplemental Materials:** None
6. **Specific Course Information:**
 - a. **Description:** Review of set theory and binary system, digital logic, Venn diagram, logic gates, minimization techniques, combinatorial logic and design of simple combinatorial logic circuits such as 1-bit adder; concept of coders, decoders and integrated circuits.
 - b. **Prerequisites:** EE 110 and must be eligible to enroll in Math 45 or Math 161. Instructor’s consent is required for co-enrollment in EE 110.
 - c. **Co-Requisite:** None
 - d. **Status:** Required for EE program, Elective, Selected Elective
7. **Specific Goals for the Course:**
 - a. **Specific outcomes of instruction:** Upon successful completion of this course the students will be able to:
 - i. Install and properly wire a digital integrated circuit to a breadboard.
 - ii. Demonstrate understanding of AND, OR, NOT, NAND, NOR, XOR, XNOR logic gates and their digital functions using truth tables, Boolean expressions, and circuit diagrams.
 - iii. Properly build and test combinational digital circuits along with generating truth tables, Boolean expressions, Sum of Minterm expressions.
 - iv. Properly simplify combinational digital circuits using Boolean algebra and Karnaugh Maps minimization techniques.
 - v. Build combinational digital circuits in all NAND form .
 - vi. Design and build real world project such as car alarms and traffic lights.
 - b. **This course supports the following ABET Student Outcomes:**
 - i. *SO-7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

8. Brief List of Topics to be Covered:

- a. Binary to decimal number system conversion and vice versa
- b. Basic logic gates and their functions
- c. Universal gates
- d. Truth tables
- e. Boolean algebra
- f. DeMorgan's theorems
- g. Karnaugh maps
- h. Sum of products form
- i. Minterms
- j. Two level NAND networks