

NEWARK COLLEGE OF ENGINEERING

SYLLABUS AND COURSE INFORMATION

Course Name: Introduction to Digital Electronics

Course Number: ECET 215

Course Structure: 2-2-3 (lecture hr/wk – lab hr/wk – course credits)

Course Description: The first course in digital electronics develops the fundamentals of the binary system, circuit implementation from Boolean functions and map minimization. Course includes study of combinational logic, sequential logic circuits, flip-flops, counters, and shift register. Computer simulation and laboratory experiments are designed to support the theory and obtain measurement skills.

Prerequisites: None

Corequisites: None

**Required, Elective,
or Selected Elective:** Required

Required Materials: **Text:** Name: Digital Electronics: A Practical Approach with VHDL
Author: William Kleitz
Year: 2011
ISBN: 978-0-13-254303-3

Course Outcomes: By the end of the course students are able to:

1. Derive, simplify, and solve Boolean algebra expressions
2. Analyze and design simple combinational logic circuits
3. Analyze and incorporate functional components such as decoders, encoders, multiplexers, demultiplexers, adders, and subtractors into circuits
4. Describe the operation of basic latches and flip flops
5. Design and analyze simple design sequential logic circuits
6. Build, test, and troubleshoot simple digital and sequential logic circuits
7. Comprehend detailed lab descriptions, perform pre-lab analyses, construct circuits in a lab, take appropriate measurements, analyze results, and prepare summaries and conclusions
8. Practice and use teamwork to complete laboratory experiments in limited time allotted, requiring subdivision of lab work and cross-checking of results
9. Design and implement a digital logic project based on simple combinational and sequential circuits

Class Topics: Boolean Algebra Logic Gates
Combinational Logic Sequential Logic
Flip-Flops K-Maps

Student Outcomes: The Course Learning Outcomes support achievement of the following

NEWARK COLLEGE OF ENGINEERING

Student Outcomes from the ETAC of ABET Criterion 3 requirements.

Student Outcome a: An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly defined engineering technology activities.

Related Course Outcome: 2 & 3

Student Outcome e: An ability to function effectively as a member or leader on a technical team.

Related Course Learning Outcomes: 7 & 8

Student Outcome f: An ability to identify, analyze, and solve broadly-defined engineering technology problems.

Related Course Learning Outcomes: 9

Academic Integrity: NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. Please visit the Dean of Students website at <http://www.njit.edu/doss> for a list of student policies relating to academic integrity and student conduct.

Modification to Course: The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course Outline.

Prepared By: Daniel Brateris

Course Coordinator: Daniel Brateris