
MIDDLESEX COUNTY COLLEGE

COURSE SYLLABUS

Department:	Engineering Technologies
Program:	Electrical Engineering Technology
Course Number:	ELT 111
Title of Course:	Digital Electronics
Curriculum Coordinator:	James Finne
Designation:	Required Course

Course Description:

A study of digital electronic circuits and systems. Introduction to number systems and Boolean Algebra topics. Digital electronic circuits and systems are analyzed and designed. Topics covered are: logic gates, Flip-Flops, registers, counters, arithmetic logic circuits, memories, and various logic families. Theory is supplemented by laboratory experiments and projects.

Prerequisite:

MAT 013 Algebra I

Co-requisite:

None

Textbooks and /or other required material:

Digital Systems-Principles and Applications by Tocci, Widmer, and Moss, Pearson, 12th Ed

Course Learning Outcomes and their relationships to Student Outcomes:

1. Describe and explain the organization of a digital computer and fundamentals of rectangular waveforms.
2. Demonstrate knowledge of Number Systems, Binary Codes, and of Boolean algebra and its application to digital circuits. **(SO a)**
3. Analyze and implement designs with logic gates.
4. Analyze arithmetic logic circuits.
5. Explain and describe the fundamentals of codes, and analyze and troubleshoot coders and decoders.
6. Analyze, Flip-Flops and timing circuits, as well as, analyze, design and troubleshoot counters and registers. **(SO e)**
7. Describe and compare characteristics of the various logic families and Programmable Logic Devices (PLD).
8. Describe the use of computer memories and analog/digital converters.
9. Demonstrate as an individual and as a team member, problem solving and written and oral communication skills.

10. Demonstrate a practical knowledge of digital systems through laboratory experiments and projects. (SO c)

Topics Covered:

- Number Systems and Electronic Switches
- Logic Circuits\Gates
- Combinational Logic Circuits
- Flip-Flops
- Flip-Flops and Related Circuits
- Digital Arithmetic Circuits
- Counters and Registers
- IC Logic Families
- A-D and D-A Converters
- Memory Devices

Laboratory Topics:

- Introduction to laboratory procedures, equipment, and sample laboratory report
- Familiarization with logic gates and their functions
- Logic circuits and Boolean algebra
- Project: Traffic light design and circuit implementation
- S-R flip-flop and the debounce switch
- J-K flip-flop, clocked, synchronous, asynchronous operation. Data and toggle flip-flops
- Timing Circuits
- Shift Registers
- Counters, decoders and displays
- Project: Application of sequential logic circuit
- Student presentations on various topics – including A/D and D/A converters, and memories

Class/Laboratory schedule. Number of sessions each week and duration of each session:

2 lectures hours per week for 14 weeks

3 laboratory hours per week for 14 weeks

Criterion 5 Contribution:

Technical Content

Prepared By:	Jack Waintraub	Date:	3/10/08
Rev 1:	Waintraub Update mapping of course outcomes to 2014-2015 student outcomes	Date:	4/10/14
Rev 2:	General Update	Date:	3/15/21