

ETR 280

Introduction to Digital Logic Circuits and Computers

Prerequisites: ETR 113

Course Description:

Studies digital logic, Boolean algebra, and arithmetic circuits, using standard integrated circuits and the functional block approach. Introduces concepts of computers, the internal operation and control language. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

Semester Credits: 4

Lecture Hours: 3

Lab/Recitation Hours: 1

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Course Outcomes

At the completion of this course, the student should be able to:

1. Convert between the number systems used in digital systems.
2. Identify commonly used integrated circuit families used in digital equipment and discuss their operation, characteristics, and features.
3. Discuss the operation and application of gates, flip-flops, digital counters, shift registers, and other digital common components.
4. Analyze and design basic combinatorial logic circuits and use circuit reduction techniques.
5. Analyze basic sequential logic circuits and explain their relation to computer-controlled systems.
6. Construct and demonstrate the operation of digital circuits.
7. Troubleshoot basic digital systems given the appropriate equipment and technical information.

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Required Materials:

1. Jump Drive
2. 6800 Microprocessor Assembler and Simulation Software (provided)
3. DosBox Virtual DOS Machine emulation Software (freeware to download)

Textbook:

Thomas L. Floyd and David M. Bushla, The Science of Electronics: Digital. Copyright © 2005 by Pearson/Prentice-Hall, ISBN: 0-13-087549-X

The following supplementary materials are available:

(N/A)

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Topical Description

Course Outline:

<u>Class Week</u>	<u>Topic</u>	<u>Text Reference</u>
1	Digital Quantities/Numbering Systems	Chapter 1
2	Logic Gates: AND, OR, Inverter	Chapter 2
3	Logic Gates: NAND, NOR	Chapter 3
4	Combinatorial Logic	Chapter 4
5	Test #1 Arithmetic Logic	--- Chapter 5
6	Binary Encoding and Decoding	Chapter 6
7	Latches, Flip-flops, and Timers	Chapter 7
8	Counters	Chapter 8
9	Test #2 Shift Registers	--- Chapter 9
10	Programmable Logic	Chapter 10
11	Computer Basics	Chapter 11
12	Digital Signal Processing and Auxiliary Topics	Chapter 12
13	Test 3 6800 Microprocessor Programming Project	--- ---
14	Project (continued) Review for Final Exam	---
15	Final Exam --.	---

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Class Name and Number

Notes to Instructors

(List information about optional topics, departmental exams, etc)

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