Virginia Western Community College
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.

Semester Credits: 4   **Lecture Hours: 3**   **Lab/Recitation Hours: 3**

Required Materials

Textbook:

Science of Electronics: Digital, Author: Floyd, Publisher: Pearson Prentice Hall, ISBN# 9780130875495

Other Required Materials:

1.   Jump Drive
2.   Arduino Microcontroller Uno (provided)
3.   Multi-Sim IC software (free to download)
4.   Arduino IDE (free to download)

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.

Topical Description

Week #	Topic	Chapter
1	Digital Quantities and Functions, Logic Gates: AND, OR, Inverter	1, 2
2	Logic Gates: NAND and N0R	3
3	Logic Gate Combinations	4
4	Logic Gate Combinations	4,5
5	Arithmetic Logic and Processes	5
6	Test 1. (Ch 1, 2, 3, 4, 5), Decoders	6
7	Encoders, Multiplexers	6
8	Latches, Flip Flops, Timers	7
9	Counters	8
10	Shift Registers	9
11	Test 2. (Ch 6, 7, 8, 9)	
12	Computer Basics, Types of Memory	11
13	Digital Signal Processing	12
14	Micro-Controller Applications	
15	Test 3, Final Review	
16	Final -	

Notes to Instructors

1. Suggested Components
   Tests, Homework, and Quizzes   50%
   Laboratory Work   20%
   Final Project   10%
   Comprehensive Final Exam   20%

2. Suggested Grading Scheme:
   Scheduled Tests   60%
   Labs and Homework   20%
   Comprehensive Final Exam 20%

3. Grading Scale:
   A = 91 – 100
   B = 81 – 90
   C = 71 – 80
   D = 60 – 70
   F = below 60

4. Recommended lab materials, sample tests and supplemental handouts are available from the program head.

5. Instructors should notify the program head at least a day in advance for any special accommodations or materials that will be needed for class.