ET255P
Digital Electronics I
[Onsite]

Course Description:

This course is a study of the fundamental concepts of digital electronics. The focus in this course is on combinatorial logic. In lab, students construct, test and troubleshoot digital circuits.

Prerequisite(s) and/or Corequisite(s):

Prerequisites: ET215P Electronic Devices I

Credit hours: 4

Contact hours: 66 (46 Theory Hours, 20 Lab Hours)

STUDENT SYLLABUS: DIGITAL ELECTRONICS

Instructor: _____

Office hours: _____

Class hours: _____

Major Instructional Areas

Number Systems and Codes
Digital Logic Families
Logic Gates
Combinational Logic Circuits
Complex Combinational Building Blocks
Arithmetic Circuits
Clocks and Timing Circuits
Flip-flops

Course Objectives

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

Demonstrate knowledge of theorems and concepts of math used in digital electronics.

Minimize logic circuits using Boolean equations.

Assemble the conventional logic gates into basic circuits.

Determine the output of a combinational circuit with given inputs.

Analyze and explain the operation of flip-flops.

Assemble and test simple circuits using flip-flops.

Analyze arithmetic-logic circuits to determine outputs for specified inputs.

Demonstrate an understanding of digital logic families.

Teaching Strategies

Curriculum is designed to promote a variety of teaching strategies that support the outcomes described in the course objectives and that foster higher cognitive skills. Delivery makes use of various media and delivery tools in the classrooms.

Student Textbook and Materials

Text: Floyd, Thomas L. *Digital Fundamentals, Custom edition taken from 8th Edition, Pearson Custom, 2005.*

Lab Manual: Buchla, David and Jerry Cox. *Supplemental Text to Accompany Digital Fundamentals, Indianapolis, IN: Pearson Custom Publishing, 2007.*

CDs: Snyder, Gary, Multisim Circuit Files to Accompany Digital Fundamentals CD, Pearson Custom, 2011.

Snyder, Gary, Multisim Circuit Files for *Supplemental Text to Accompany Digital Fundamentals CD, Pearson Custom, 2011.*

The lab manual is a custom-published book combining material from both the Buchla and Cox standard manuals (ISBNs 013-084660-0 and 013-084672-4).

Course Outline

Unit Week	Topic (Lecture Period)	Chapters	Lab and Other Coverage
1 Week 1	Introductory Digital Concepts	1	Inventory and Test Equipment Review. Read Buchla pp. 1 -11
2A Week 2	Number Systems, Operations and Codes	2-1 through 2-6	Cox 2, Buchla 3
2B Week 3	Number Systems, Operations and Codes	2-7 through 2-11	MULTISIM: Buchla 4, 5
3 Week 4	**Exam I** & Logic Gates	3	Cox 3, 4, 5
4 Week 5	Integrated Circuit Technologies	15	Buchla 6, Cox 7
5A Week 6	**Exam II** & Boolean Algebra and Logic Simplification	4-1 through 4-5	MULTISIM: Cox 8, 10
5B Week 7	Boolean Algebra and Logic Simplification	4-6 through 4-9 and 4-12	Buchla 7, Cox 9
6 Week 8	Combinational Logic	5	Buchla 10, set up Buchla 11

7 Week 9	**Exam III** & Functions of Combinational Devices	6	Buchla 11, MULTISIM: Buchla 12
8 Week 10	Flip-Flops and Related Devices	8 (except 8-3)	Buchla 15, Buchla 17
9 Week 11	Review and Final Examination	Covers above chapters	Lab Final Exam

Evaluation Criteria and Grade Weights

Quizzes	10 %	
Homework		15 %
Exams	15 %	
Lab exercises	25 %	
Final exam		20 %
Lab Final	15 %	

Final grades will be calculated from the percentages earned in class as follows:

A	90 - 100%	4.0
B+	85 - 89%	3.5
B	80 - 84%	3.0
C+	75 - 79%	2.5
C	70 - 74%	2.0
D+	65 - 69%	1.5
D	60 - 64%	1.0
F	<60%	0.0