SYLLABUS
PART I
EDISON COMMUNITY COLLEGE
ELT 141S DIGITAL ELECTRONICS
3 CREDIT HOURS

COURSE DESCRIPTION

Introduction to number systems, numerical codes and arithmetic operations peculiar to digital systems. Design and analysis of combinational logic circuitry by application of Boolean algebra and mapping methods are studied. Flip-flops, counters, and various clocked circuits provide the introduction to sequential logic circuit design. Synthesis and analysis of state machines are presented in the context of process control systems. Electrical and timing parameters of digital IC devices and families are studied with emphasis on interfacing. The student will learn how to program complex programmable logic devices. Prerequisite: ELT 110S. Lab fee.

COURSE GOALS

The student will:

Bloom's Level		Program Outcomes
3	1. Apply binary and hexadecimal number systems, various binary codes, their conversions and arithmetic operations.	3
5	2. Design and analyze combinational logic circuits.	2
3	3. Interface logic circuits with regard to electrical and timing considerations.	1
2	4. Explain the operation of sequential logic circuits.	1
5	5. Design and analyze state machines and other sequential logic circuits.	2
3	6. Use test equipment in digital circuit troubleshooting tasks.	5, 4
3	7. Demonstrate how to program combinational and sequential logic in Complex Programmable Logic Devices.	3
2	8. Explain the role of combinational logic, sequential logic and timers in process control.	2
2	9. Interpret positive and negative logic.	3

CORE VALUES

The Core Values are a set of principles that guide in creating educational programs and environments at Edison. They include communication, ethics, critical thinking, human diversity, inquiry/respect for learning, and interpersonal skills/teamwork. The goals, objectives, and activities in this course will introduce/reinforce these Core Values whenever appropriate.

TOPIC OUTLINE

1. Binary, octal and hexadecimal numbering system and conversion
2. Logic functions and logic gates
3. Sum of products and product of sums equation form applied to circuit design
4. Simplification and minimization of Boolean equations; Karnaugh mapping
5. Introduction to programmable logic devices and programming software
6. Digital decoders, encoders, multiplexers and demultiplexers
7. Digital arithmetic and arithmetic circuits
8. Introduction to sequential logic
9. Introduction to programmable logic architecture
10. Counters and shift registers
11. State machine design
12. Electrical characteristics of TTL and CMOS gates
13. Analog to digital and digital to analog conversion