

DESCRIPTION

The second in a sequence of courses that prepares individuals to apply technical knowledge and skills to assemble and operate electrical/electronic equipment used in business, industry, and manufacturing. Instruction includes training in safety, numbering systems, Boolean algebra, logic diagrams, digital devices, and combinational logic circuits.

Total Test Questions: 27

Levels: 10-12

Units of Credit: 0.5

Prerequisites: Electronics I

STANDARDS, OBJECTIVES, AND INDICATORS

STANDARD 1

10% of Exam Blueprint

◆ STUDENTS WILL FOLLOW SAFETY PRACTICES.

- Objective 1: Identify potential safety hazards and follow general laboratory safety practices.
1. Assess workplace conditions with regard to safety and health.
 2. Identify potential safety issues and align with relevant safety standards to ensure a safe workplace/jobsite.
 3. Describe typical electric shock hazards in industry.
 4. Describe the effects of electricity on the human body.
 5. Locate and understand the use of shop safety equipment.
 6. Select appropriate personal protective equipment.
- Objective 2: Use safe work practices.
1. Use personal protective equipment according to manufacturer rules and regulations.
 2. Follow correct procedures when using any hand or power tools.
- Objective 3: Complete a basic safety test without errors (100%) before being allowed to use shop facilities.

STANDARD 2

25% of Exam Blueprint

◆ STUDENTS WILL UNDERSTAND VARIOUS NUMBER SYSTEMS USED IN DIGITAL ELECTRONICS.

- Objective 1: Understand the structure of, and how to count in, various numbering systems.
1. Use the decimal number system.
 2. Use the octal number system.
 3. Use the hexadecimal number system.
 4. Use the binary number system.
- Objective 2: Perform operations in various numbering systems.
1. Convert between decimal and binary.
 2. Convert between octal and binary.
 3. Convert between hexadecimal and binary.



STANDARD 3

40% of Exam Blueprint

◆ **STUDENTS WILL UNDERSTAND THE FUNCTIONS OF TYPICAL LOGIC GATES AND THEIR LOGIC STATES.**

- Objective 1: Describe the function of and create truth tables for typical logic gates.
1. AND, NAND
 2. OR, NOR
 3. XOR, XNOR
 4. Buffer (YES), Inverter (NOT)

STANDARD 4

15% of Exam Blueprint

◆ **STUDENTS WILL UNDERSTAND, CONSTRUCT, AND TEST COMBINATIONAL LOGIC CIRCUITS.**

- Objective 1: From schematic diagrams and specifications, write a truth table and the Boolean equation for combinational logic circuits.
- Objective 2: Simplify combinational logic circuits using Boolean identities, De Morgan's Theorems, and logical equivalencies.
- Objective 3: Construct combinational logic circuits.
- Objective 4: Predict the logic levels in all parts of combinational logic circuits.
- Objective 5: Use a logic probe to test and verify logic levels in all parts of combinational logic circuits.

STANDARD 5

10% of Exam Blueprint

◆ **STUDENTS WILL UNDERSTAND, CONSTRUCT, AND TEST SEQUENTIAL LOGIC CIRCUITS.**

- Objective 1: Define the properties of:
1. D flip-flop.
 2. JK flip-flop.
- Objective 2: Describe the operation and application of:
1. Shift registers
 2. Frequency dividers and counters
 3. Synchronous up/down and shift counters
 4. Multivibrators
- Objective 3: Construct and test sequential logic circuits



PERFORMANCE STANDARD EVALUATION CHECKLIST

Student Name _____

Instructor's Name _____

School _____ District _____

Performance Rating Scale:



Limited Skills.....Moderate Skills.....High Skills

Performance assessments may be completed and evaluated at any time during the course. The following performance skills are to be used in connection with the associated written exam. To pass the performance standard the student must attain a performance standard average of **8 or higher** on the rating scale. Students may be encouraged to repeat the objectives until they average **8 or higher** for the following elements:

PERFORMANCE SKILLS OBJECTIVES	
Standard 1 – Follow safety practices	Score:
Standard 2 – Understand various number systems used in digital electronics.	Score:
Standard 3 – Understand the functions of typical logic gates and their logic states.	Score:
Standard 4 – Understand, construct, and test combinational logic circuits.	Score:



PERFORMANCE SKILLS STANDARDS	
Standard 5 – Understand, construct, and test sequential logic circuits.	Score:
PERFORMANCE OBJECTIVE AVERAGE	Average:

