

STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

COURSE OUTLINE

ELEC 125 – DIGITAL SYSTEMS FOR TELECOMMUNICATIONS I

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CANINO SCHOOL OF ENGINEERING TECHNOLOGY
ELECTRICAL TECHNOLOGY
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ELEC 125 – DIGITAL SYSTEMS FOR TELECOMMUNICATIONS I

- A. **TITLE:** DIGITAL SYSTEMS FOR TELECOMMUNICATIONS I
- B. **COURSE NUMBER:** ELEC 125
SHORT TITLE: Digital Systems I
- C. **CREDIT HOURS:** 4
- D. **WRITING INTENSIVE COURSE (OPTIONAL):** N/A
- E. **COURSE LENGTH:** 15 weeks including final exam
- F. **SEMESTER(S) OFFERED:** Spring
- G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:** 3 hours lecture and 2 hours laboratory per week
- H. **CATALOGUE DESCRIPTION:** This course presents topics in hardware and systems as used in the telecommunications industry. Electrical and digital circuits are explored. Binary numbers systems are discussed as applied to telecommunications equipment. Students will explore hardware to the modular level. Student will demonstrate use of and simulate digital circuits.
- I. **PRE-REQUISITES/CO-COURSES:** MATH 135 – Technical Math 1, CITA 116 – Computer Applications for Telecommunications
- J. **GOALS (STUDENT LEARNING OUTCOMES):**

<i>Course Objective</i>	<i>Institutional SLO</i>
a. Simulate a simple DC circuit using a software application. Simulate a simple logic circuits and identify inputs and outputs.	2. Crit. Thinking 3. Prof. Competence
b. Describe the behavior of voltage, current, resistance, in a series and a parallel circuits.	1. Communication 2. Crit. Thinking
c. Convert numbers among the binary, decimal, octal, and hexadecimal numbering systems.	2. Crit. Thinking 3. Prof. Competence
d. Describe the relationship between digital and analog quantities.	1. Communication 2. Crit. Thinking
e. Describe the digital computer organization and operation including the CPU, motherboard, and memory.	1. Communication 2. Crit. Thinking
f. Explain different types of primary and secondary storage devices.	1. Communication 2. Crit. Thinking
g. Describe and verify the proper operation of peripheral devices.	1. Communication 2. Crit. Thinking

K. TEXTS:

1. The Science of Electronics: Digital by Floyd/Buchla, Prentice Hall
2. A+ Guide to Managing and Maintaining Your PC Fifth Edition Enhanced, Comprehensive by Andrews, Course Technology
3. EWB MultiSim Student Suite

L. REFERENCES:

M. EQUIPMENT: Blackboard and the internet are to be used as an integral part of the course delivery process, Laptop computer, Scientific calculator, MultiSim, Microsoft Office

N. GRADING METHOD: (P/F, A-F, etc.) A-F

O. MEASUREMENT CRITERIA/METHODS:

Typical breakout as determined by individual faculty, to include:

1. Pre-testing, progress testing, and post-testing
2. Completion of Blackboard-posted assignments (HW, study, etc.)
3. Completion of hands-on lab work and a Project

P. GENERAL TOPICAL OUTLINE:

Q. DETAILED TOPICAL OUTLINE:

1. Basic Electricity Concepts
 - a. Definitions – Resistance, Current, Voltage, Power
 - b. Ohm’s Law
 - c. Electrostatic Discharge
 - d. Electromagnetic Interference
2. Introduction to Digital Systems
 - a. Digital concepts: analog vs. digital, advantages/disadvantages
 - b. Number systems: decimal, binary, octal, hex
 - c. Conversions and arithmetic (addition and subtraction)
3. Binary Codes and Introduction to Logic
 - a. Binary Codes
 - b. BDC, ASCII
 - c. Parity check
 - d. Parallel/serial transmission Serial/Parallel and synchronous/asynchronous
 - e. Introduction to Logic
 - f. AND, OR, NOT, NAND, NOR, XOR
4. Power Supplies and Power Protection
 - a. AT, ATX, ATX2
 - b. UPS
 - c. Power Line Conditioners
5. Understanding the Motherboard, the CPU, and Troubleshooting Basics
 - a. The CPU
 - b. Form Factors

- c. Components on the Motherboard
- d. Troubleshooting a Motherboard
- 6. Managing Memory
 - a. ROM (EPROM, EEPROM, Flash)
 - b. RAM (SIMM, DIMM, RIMM, SODIMM)
 - c. Speed and Access time
 - d. Upgrading and replacing Memory
- 7. Understanding, Installing, and Troubleshooting Disk Drives
 - a. Hard Drives
 - 1. Standards
 - 2. Sizes
 - 3. Partition and Setup
 - b. Mass Storage
 - 1. Zip
 - 2. CD-burners
 - 3. DVD-burners
 - 4. Jump Drives/Flash Drives
 - 5. Tape drives

8. Installing and Using Windows 98
 - a. Features and Architecture
 - b. Installing
 - c. Using
 - d. Installing Hardware and Software
9. Supporting Input, Output, and Multimedia Devices
 - a. Types of Video Cards and Ports
 - b. Types of Monitors (CRT, Flat screen, Flat panel (LCD), Touch Screen)
 - c. Types of Sound Cards
 - d. Keyboards
 - e. Mouse
 - f. Ports

R. LABORATORY OUTLINE:

1. Basic Electricity Concepts
2. Introduction to Digital Systems
3. Binary Codes and Introduction to Logic
4. Power Supplies and Power Protection
5. Understanding the Motherboard, the CPU, and Troubleshooting Basics
6. Managing Memory
7. Understanding, Installing, and Troubleshooting Disk Drives
8. Installing and Using Windows 98
9. Supporting Input, Output, and Multimedia Devices