



Microprocessor Applications

Course: ELE243	Lec + Lab 3 Credit(s) 5 Period(s) 4.4 Load
First Term: 2002 Summer I	Course Type: Occupational
Final Term: Current	Load Formula: S

Description: Presents the microprocessor in computing and control applications. System hardware and software used to control the microprocessor system to perform input/output operations

Requisites: Prerequisites: A grade of C or better in ELE241 or ELT241.

Cross-References: ELT243

MCCCD Official Course Competencies

1. Discuss and analyze memory addressing and interfacing. (I)
 2. Discuss and analyze basic input/output functional blocks including the UART and parallel interfacing devices. (II) Competencies (continued):
 3. Analyze and discuss input/output techniques necessary for interfacing keyboards, displays, and stepper motors to a microprocessor. (II)
 4. Describe microprocessor applications using digital-to-analog and analog-to-digital conversion. (II)
 5. Discuss the microprocessor interrupt structure. (III)
 6. Describe various digital communications standards including RS232C and IEEE-488. (IV)
 7. Identify and describe direct memory access controllers. (V)
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MCCCD Official Course Outline

- I. Memory Interface
 - A. Functional organization of a digital computer system
 - B. Memory access methods
 - C. Static and dynamic memory systems
- II. Input/Output Interface Circuitry and Systems
 - A. Simple input/output devices and device selection
 - C. The peripheral interface adapter
 - D. Solenoid operated devices and stepper motors
 - E. Output-only devices
 - F. Input/output devices
- III. Peripherals

- A. Magnetic disk subsystem
 - B. Individual microprocessor interrupt structures
 - C. Typical problems that occur
 - IV. Microprocessor Based Communications
 - A. The serial communications interface adapter
 - B. Typical problems that occur
 - C. The RS-232C interface standard and current loops
 - D. Functional operation
 - E. Typical problems that occur
 - V. Interfacing between a peripheral and the processor input/output
 - III. Introduction to data communications
 - B. Terminology
 - B. Modems
 - C. Basic elements of a communications process
 - D. Serial and parallel transmission
 - E. Modes of transmission
 - 1. Simplex
 - 2. Half-duplex
 - 3. Full-duplex
 - F. Serial transmission characteristics
 - 1. Asynchronous serial transmission
 - 2. Synchronous serial transmission
 - IV. Purpose of an operating system
 - A. How an operating system manages sharing of the processor and memory
 - B. VAX-11 processor access modes
 - C. Context switching
 - D. VAX-11 memory structure
 - E. VAX-11 page tables
 - F. VAX-11 system and process address space regions
 - G. I/O interrupt
 - H. VAX-11 exception conditions
 - I. Interrupts vs exceptions
 - J. Vectors
 - K. Software interrupts
 - V. The structure of a VAX-11 operating system
 - A. VMS process scheduling
 - B. Events that cause the process to change states
 - C. Paging and swapping under VMS
 - D. VMS I/O organization and data base
 - E. VMS I/O system components
 - F. VMS I/O control flow
 - G. VMS utilization of I/O interrupt priority levels
 - VI. Applying VAX/VMS input/output
 - A. VAX/VMS system documentation
 - B. Writing a program which interfaces with a terminal
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Last MCCC D Governing Board Approval Date: **2/26/2002**

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