NIDA CORPORATION
COMPUTER ASSISTED INSTRUCTION

LESSON AND OBJECTIVE LISTING

Master Course Listing
Microprocessors

2018-08-30

Representative

Technology Education Concepts
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MOD 31 - MICROCONTROLLER (8051)

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- ▪ Describe a brief development of microprocessors.
- ▪ Identify the major parts of a microprocessor system.
- ▪ Define common terms associated with microprocessors.

5082-212-160 Basic Microprocessor Operations . . . . ---
- ▪ Identify parts of a microprocessor and describe microprocessor operation.
- ▪ Define and describe internal registers and counters.
- ▪ Understand the physical characteristics of RAM and ROM.
- ▪ Describe the difference between RAM and ROM.
- ▪ Understand the configuration caches, conventional, extended, upper, high, and expanded memory.
- ▪ Know the purpose of caches, conventional, extended, upper, high, and expanded memory.
- ▪ Explain the evolution of caches, conventional, extended, upper, high, and expanded memory.

5082-212-190 Microprocessor Number Systems . . . . ---
- ▪ Identify different mathematical numbering systems.
- ▪ Describe and perform number system conversions.
- ▪ Describe and perform binary addition and subtraction.
- ▪ Describe and perform multiplication and division.

5082-222-130 8051 Microcontroller Circuit 405, 406, 407
- ▪ Describe the internal structure of the 8051 microcontroller.
- ▪ Describe the timed operations of the 8051 microcontroller.
- ▫ Observe signals from the 8051 microcontroller circuit.
- ▫ Enter a simple program to observe system operation.

5082-222-160 Operation of the 8051 Microcontroller 405, 406, 407
- ▪ Describe external timing and control connections to the 8051 microcontroller.
- ▪ Describe the memory connections to the 8051 microcontroller.
- ▫ Observe the various signals generated by the 8051 microcontroller.
- ▫ Observe the operation of external memory.

5082-222-190 Interfacing with the 8051 Microcontroller 405, 406, 407
- ▪ Describe the connection of input/output devices attached to the 8051.
- ▪ Understand the different types of input/output devices connected to a microcontroller.
- ▫ Observe signals of the keyboard circuitry in the microcontroller system.

5082-222-220 Troubleshooting the 8051 Microcontroller 405, 406, 407
- ▪ Describe the techniques required to troubleshoot a defective microcontroller system.
- ▪ Describe preventive maintenance.
- ▪ Describe the basic tool used to troubleshoot a microcontroller system.
- ▫ Perform successful troubleshooting with the 8051 microcontroller trainer.
- ▫ Understand basic fault types in a microcontroller system.

5082-222-920 8051 Microcontroller Post-Test (Theory) . . . . ---

MOD 32 - MICROPROCESSOR (8085/8086)

5082-212-130 Introduction to Microprocessors . . . . ---
- ▪ Describe a brief development of microprocessors.
- ▪ Identify the major parts of a microprocessor system.
- ▪ Define common terms associated with microprocessors.

OBJECTIVE LISTING - Master Course Listing

MOD 32 - MICROPROCESSOR (8085/8086) (cont.)

5082-212-160 Basic Microprocessor Operations . . . . ---
- Identify parts of a microprocessor and describe microprocessor operation.
- Define and describe internal registers and counters.
- Understand the physical characteristics of RAM and ROM.
- Describe the difference between RAM and ROM.
- Understand the configuration caches, conventional, extended, upper, high, and expanded memory.
- Know the purpose of caches, conventional, extended, upper, high, and expanded memory.
- Explain the evolution of caches, conventional, extended, upper, high, and expanded memory.

5082-212-190 Microprocessor Number Systems . . . . ---
- Identify different mathematical numbering systems.
- Describe and perform number system conversions.
- Describe and perform binary addition and subtraction.
- Describe and perform multiplication and division.

5082-224-140 8085 Microprocessor Circuits . . . . ---
- Describe the internal structure of the 8085 microprocessor.
- Describe the timed operations of the 8085 microprocessor.

5082-224-170 Operation of the 8085 Microprocessor . . . . ---
- Describe timing and control connections to the 8085 microprocessor.
- Describe the memory connections to the 8085 microprocessor.

5082-224-200 Interfacing with the 8085 Microprocessor . . . . ---
- Describe the connection of input/output devices attached to the 8085.
- Understand the different types of input/output devices connected to a microprocessor.

5082-224-230 Troubleshooting the 8085 Microprocessor . . . . ---
- Describe the techniques required to troubleshoot a defective microprocessor system.
- Describe preventive maintenance.
- Describe the basic tools used to troubleshoot a microprocessor system.

5082-226-130 8086 Microprocessor Circuit 401, 404, 410, 411
- Describe the internal structure of the 8086 microprocessor.
- Understand the various internal components.
- Understand the external connections to the 8086.
- Demonstrate the ability to examine signal conditions of the 8086.
- Demonstrate the ability to enter a program into the 8086.

5082-226-160 Operation of the 8086 Microprocessor 401, 404, 410, 411
- Describe external timing and control connections to the 8086 microprocessor.
- Describe the memory connections to the 8086 microprocessor.
- Observe the various signals generated by the 8086 microprocessor.
- Observe memory interface signals during actual microprocessor operation.

5082-226-190 Interfacing with the 8086 Microprocessor 401, 404, 410, 411
- Describe the connection of input/output devices attached to the 8086.
- Understand the different types of input/output devices connected to a microprocessor.
- Observe the operation of an input/output device as it is used in a microprocessor system.

5082-226-220 Troubleshooting the 8086 Microprocessor 401, 404, 410, 411
- Describe the techniques required to troubleshoot a defective microprocessor system.
- Describe preventive maintenance.
- Describe the basic tools used to troubleshoot a microprocessor system.

LESSON ID/TITLE   CARDS/KITS

MOD 32 - MICROPROCESSOR (8085/8086) (cont.)
  5082-226-220 Troubleshooting the 8086 Microprocessor (cont.)
   ▫ Perform successful troubleshooting with the 8086 microprocessor trainer.
   ▫ Understand basic fault types in a microprocessor system.
  5082-226-250 8086 Data Transfer Instructions . . . . `401, 404, 410, 411`
   ▪ Describe immediate data transfers.
   ▪ Describe direct data transfers.
   ▪ Describe indirect data transfers.
   ▫ Perform immediate data transfers in an 8086 microprocessor.
   ▫ Perform direct data transfers in an 8086 microprocessor.
   ▫ Perform indirect data transfers in an 8086 microprocessor.
  5082-226-280 8086 Addition and Subtraction . . . . `401, 404, 410, 411`
   ▪ Describe computer addition.
   ▪ Describe computer subtraction.
   ▫ Perform computer addition.
   ▫ Perform computer subtraction.
  5082-226-310 8086 Logic Instructions . . . . `401, 404, 410, 411`
   ▪ Describe logic instructions.
   ▫ Perform operations using logic instructions.
  5082-226-340 8086 Jump Instructions . . . . `401, 404, 410, 411`
   ▪ Describe jump instructions.
   ▫ Perform jump instructions.
  5082-226-920 8086 Microprocessor Post-Test (Theory) . . . . `---`

MOD 33 - MICROPROCESSOR (68000)
  5082-212-130 Introduction to Microprocessors . . . . `---`
   ▪ Describe a brief development of microprocessors.
   ▪ Identify the major parts of a microprocessor system.
   ▪ Define common terms associated with microprocessors.
  5082-212-160 Basic Microprocessor Operations . . . . `---`
   ▪ Identify parts of a microprocessor and describe microprocessor operation.
   ▪ Define and describe internal registers and counters.
   ▪ Understand the physical characteristics of RAM and ROM.
   ▪ Describe the difference between RAM and ROM.
   ▪ Understand the configuration caches, conventional, extended, upper, high, and expanded memory.
   ▪ Know the purpose of caches, conventional, extended, upper, high, and expanded memory.
   ▪ Explain the evolution of caches, conventional, extended, upper, high, and expanded memory.
  5082-212-190 Microprocessor Number Systems . . . . `---`
   ▪ Identify different mathematical numbering systems.
   ▪ Describe and perform number system conversions.
   ▪ Describe and perform binary addition and subtraction.
   ▪ Describe and perform multiplication and division.
  5082-228-130 Introduction to 68000 Microprocessors . . . . `---`
   ▪ Identify the major sections of a microprocessor system.
   ▪ Define the buses used by the 68000 for addressing, data, and control.

MOD 33 - MICROPROCESSOR (68000) (cont.)

5082-228-130 Introduction to 68000 Microprocessors (cont.)
- Define the modes of operation for the 68000.
- Understand the use and manipulation of binary, hexadecimal, and decimal numbering systems.
- Understand ASCII and BCD data encoding.

5082-228-160 The 68000 Microprocessor 401, 403, 404, 468
- Define the different package styles of the 68000 microprocessor.
- Understand label identification on the 68000 microprocessor.
- Identify the address, data and control buses of the 68000 microprocessor.
- Identify the operation of the clock and reset circuits of the 68000 microprocessor.
- Identify the operation of the microprocessor interrupts.
- Observe the operation of the 68000 buses.

5082-228-190 Registers and Memory 401, 403, 404, 468
- Define the purpose and usage of the internal registers.
- Understand the operation of the user and supervisor stacks.
- Define the types of external memory.
- Explain the connections and control of memory in the 68000 microprocessor.
- Observe the contents of registers in the 68000.
- Observe the contents of external memory to the 68000.

5082-228-220 I/O Circuits 401, 403, 404, 468
- Understand the purpose and usage of I/O circuits.
- Understand the operation of the 68000 keyboard.
- Understand the operation of the 68000 LCD.
- Understand the operation of the serial and parallel ports.
- Observe data communications through the parallel port.

5082-228-250 Operation of the 68000 . . . . 401, 403, 404, 468
- Explain the vector addressing of the 68000 microprocessor.
- Understand the different states of microprocessor operation.
- Describe the different types of exceptions recognized by the 68000 microprocessor.
- Observe the occurrence of exceptions in manually entered code.
- Explain and observe the results of the exceptions caused by the manually entered code.

5082-228-280 Introduction to Programming 401, 403, 404, 468
- Explain the purpose and usage of programming in a microprocessor system.
- Understand the different types of programming and the type used by the Nida 68000 microprocessor trainer.
- Define the different groups of instructions and which instructions are in those groups.
- Observe and understand all of the instruction code of a simple program.
- Observe the effects of executing the simple program.

5082-228-310 Move and Branch Commands 401, 403, 404, 468
- Define, understand, and use the different types of move instructions.
- Define, understand, and use the different types of branch instructions.
- Demonstrate the usage of move and branch commands.

5082-228-340 Arithmetic and Logic Commands 401, 403, 404, 468
- Understand the different types and use of arithmetic instructions.
- Understand the different types and use of logic instructions.
- Demonstrate the use of both arithmetic and logic instructions.

MOD 33 - MICROPROCESSOR (68000) (cont.)

5082-228-370 Test and Additional Commands 401, 403, 404, 468
- ▪ Understand the different types of test instructions.
- ▪ Understand the different uses of test instructions.
- ▪ Understand the different types of additional instructions.
- ▪ Understand the different uses of additional instructions.
- ▫ Demonstrate the use of a test instruction.
- ▫ Demonstrate the use of an additional instruction.

5082-228-400 Debugging and Compatibility 401, 403, 404, 468
- ▪ Understand debugging programs and tools.
- ▪ Identify other Motorola processors compatible with the 68000, and understand their characteristics.
- ▫ Demonstrate the ability to debug a small program.

5082-228-430 Troubleshooting the 68000 . . . . 401, 403, 404, 468
- ▪ Define the techniques required to troubleshoot a defective microprocessor system.
- ▪ Describe preventive maintenance.
- ▪ Describe the basic tools used to troubleshoot microprocessor systems.
- ▫ Perform successful troubleshooting with the 68000 microprocessor trainer.

5082-228-920 68000 Microprocessor Post-Test (Theory) . . . . ---

NOTES

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