

REQUIRED SKILLS AND KNOWLEDGE – UEENEEI116A

KS01-EI116A Microprocessor equipped devices

Topic and Description	NIDA Lesson	CARD #
<p>T1 Overview of digital controllers</p> <ul style="list-style-type: none"> • types • block diagram of controller • applications • terms 	<p>Introduction to Microprocessors 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.</p>	<p>8086-680000</p>
<p>T2 Controller input and output equipment</p> <ul style="list-style-type: none"> • input sensors (transducers) • current loop concepts 	<p><u>Transducers</u> 7107 - INTRODUCTION TO TRANSDUCERS * Identify Types of Transducers * Understand Transducer Operating Principles.</p>	

	<p>electricity.</p> <ul style="list-style-type: none"> * Observe the usage of optical fiber as a medium for light transmission. <p>1405-Lesson 2 Temperature Transducers</p> <ul style="list-style-type: none"> * Analyze the static thermal sensitivity of 4 basic temperature transducers. * Determine the range, linearity, and sensitivity of various thermal transducers using graphical analysis. * Analyze dynamic temperature transducer amplifiers, including null type bridge circuits (Optional Activities). <p>1405-Lesson 3 Motion Detection</p> <ul style="list-style-type: none"> * Identify the principles of motion transducers. * Compute linear and circular motion rates based on a system's mechanical and electrical parameters. * Analyze the operation of optical-motion-to-frequency and motion-to-analog-DC-voltage transducer circuits for rpm and velocity. * Analyze the operation of optical-motion-to-analog-DC-voltage transducer circuits for acceleration and deceleration (Optional Activities). <p>1405-Lesson 4 Position Detection</p> <ul style="list-style-type: none"> * Identify the principles of analog and digital position-sensing circuits. * Compute linear and rotary position based on electrical and mechanical circuit parameters. * Analyze the operation of an encoder wheel position-sensing circuit with CCW/CW sensing and digital readout. * Analyze the operation of an increment wheel position-sensing circuit with pulse-modulated 2-digit, 7-segment readout (Optional Activities). 	<p>252</p> <p>255</p> <p>256, 257</p>
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<p>T3 Installation of controllers</p> <ul style="list-style-type: none"> • types of input sensors • wiring • mounting techniques • terminal types • output current protection 	<p><u>NOT HTML YET</u></p> <p>7107 - INTRODUCTION TO TRANSDUCERS</p> <ul style="list-style-type: none"> * Identify Types of Transducers * Understand Transducer Operating Principles. <p>7101 - NATURE OF LIGHT</p> <ul style="list-style-type: none"> * Describe opto-electronics. * Describe the classification of opto-electronics devices. * Describe light. * Describe photometric and radiometric energy. <p>7102 - LIGHT TRANSDUCERS</p> <ul style="list-style-type: none"> * Describe the ratings of light sources. * Describe incandescent lamps. * Describe LEDs. * Describe the ratings of light sensors. * Describe photocells. * Describe photodiodes. * Describe photovoltaics. * Describe phototransistors <p>7103 - LIGHT TRANSDUCER OPERATION</p> <ul style="list-style-type: none"> * Observe the operation of typical light transmitters. * Measure the voltage/current characteristics of typical light transmitters. * Observe the operation of typical light receivers. * Measure the resistance/current/voltage characteristics of typical light receivers. <p>7104 - NATURE OF HEAT</p> <ul style="list-style-type: none"> * Describe thermo-electronics. * Describe the classification of thermo-electronics devices. * Describe heat. * Describe heat-measuring systems. * Describe heat units. <p>7105 - HEAT TRANSDUCERS</p> <ul style="list-style-type: none"> * Describe 12R heat generators. * Describe thermal resistance. * Describe heat dissipation. * Describe mechanical heat sensors. * Describe thermo-couples. * Describe thermistors. 	<p>251</p>
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<p>T4 Configuration and digital controller set-up</p> <ul style="list-style-type: none"> • operator interfaces • manufacturer's data • testing 	<p>. 68000 Microprocessor Circuits</p> <p>5082-228-130 Introduction to 68000 Microprocessors</p> <ul style="list-style-type: none"> ▪ Identify the major sections of a microprocessor system. ▪ Define the buses used by the 68000 for addressing, data, and control. ▪ 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. <p>5082-228-160 The 68000 Microprocessor .</p> <ul style="list-style-type: none"> ▪ 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. <p>5082-228-190 Registers and Memory .</p> <ul style="list-style-type: none"> ▪ 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. <p>5082-228-220 I/O Circuits</p> <ul style="list-style-type: none"> ▪ 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. <p>5082-228-250 Operation of the 68000 .</p> <ul style="list-style-type: none"> ▪ 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. 	<p>401,403, 404,468</p> <p>401,403, 404,468</p> <p>401,403, 404,468</p> <p>401,403, 404,468</p>
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