

## FOUNDATION PROGRAM - CORE CURRICULUM

	PROGRAM	COURSE TITLE & NUMBER	COURSE DESCRIPTION	PREREQUISITES
1	Foundation - Core	MAT1-Whole Numbers (MAT1EFV)	MAT1- Whole Numbers	--
2	Foundation - Core	MAT2-Fractions (MAT2EFV)	MAT2- Fractions	MAT1EFV
3	Foundation - Core	MAT3-Decimals (MAT3EFV)	MAT3-Decimals	MAT1EFV
4	Foundation - Core	MCT3-The Use of Measuring Tools (MCT3EFV)	This course explains the importance of precise measurement in machine technology and identifies the tools to be used to take various precise measurements.	MAT1EFV
5	Foundation - Core	MCT5-Vernier Caliper and Vernier Protractor (MCT5EFV)	This Course deals with the Vernier scale and how it is used with two common machinist's tools – the Vernier caliper and the Vernier protractor.	MAT1EFV
6	Foundation - Core	ACDC6-Electrical Measurements (ACD6EFV)	This course will give an introduction about Electrical Measurements.	MAT1EFV
7	Foundation - Core	ELS7-AC Motor Control and Current Measurement (ELS7EFV)	Industrial Electricity: AC Motor Control and Current Measurement	MAT1EFV
8	Foundation - Core	ADC1-Voltage, Resistance, and Current (ADC1EFV)	Voltage, Resistance, and Current	--
9	Foundation - Core	MTR2-Overload Protection Devices (MTR2EFV)	This training course provides information vital to understanding modern motor control systems. It discusses the three categories of motor control types, their characteristics and location.	ADC1EFV
10	Foundation - Core	MTR4-Motor Controls: Schematic Symbols (MTR4EFV)	This course teaches the fundamentals of various schematic symbols used in motor control circuit diagrams.	MTR4EFV
11	Foundation - Core	MTR5-Motor Controls: Schematics and Wiring Diagrams (MTR5EFV)	This course teaches the fundamentals of schematic and wiring diagrams for electrical motor control circuits	MTR5EFV
12	Foundation - Core	PLC1-Fundamentals (PLC1EFV)	This course teaches students the fundamentals of Programmable Logic Controllers, or PLCs and helps form the foundation on which programming and troubleshooting techniques are built. Areas covered are the components of a typical PLC, ladder diagrams, logic functions and number systems.	ADC1EFV
13	Foundation - Core	PLC3-Inputs and Outputs (PLC3EFV)	Input and output modules provide an interface that allows the PLC to communicate with its connected devices.	PLC3EFV
14	Foundation - Core	MDR1-Industrial Drive Systems: Belt Drives (MDR1EFV)	One of the industrial drive systems used to transmit mechanical power is the belt drive system. The belt drive system fundamentals are discussed, to include safety and the construction of belt materials and shapes. Additional information is presented on the belt drive equipment and determining system speed ratios. Finally, installation procedures and troubleshooting is explained.	--
15	Foundation - Core	MDR2-Industrial Drive Systems: Chain Drives (MDR2EFV)	In the course, the student is presented with information about the fundamentals of chain drive systems including basic chain drive safety, major types of chains, chain tension, and chain drive equipment. Content then proceeds to a discussion of chain removal and installation procedures and how to service the system. The course concludes with a look at maintenance and troubleshooting for chain drive systems, with special attention paid to lubrication systems.	--
16	Foundation - Core	MEC1-Mechanical Electrical Control Systems: Introduction to Control Schematics (MEC1EFV)	Introduction to Control Schematics	ADC1EFV
17	Foundation - Core	BPR5-Instrumentation Symbols (BPR5EFV)	This course identifies the symbols found on process and instrumentation diagrams. The process represented by a simple loop diagram is explained.	--
18	Foundation - Core	BPR2 - Process Control Modes (BPR2EFV)	The Process Control Modes training course was designed to help students understand the fundamental principles of controllers in instrument control systems. It explains the four modes of control action that are commonly used to control industrial process operations (i.e., two-position, proportional, integral, and derivative).	BPR5EFV
19	Foundation - Core	BPR4-Process Variables (BPR4EFV)	This course explains the characteristics and measurement techniques for the process control variables to include pressure, level, temperature and flow.	BPR5EFV
20	Foundation - Core	EMS3-Sensor and Transducer Principles (EMS3EFV)	Electronic Maintenance Series: Sensor and Transducer Principles	ADC1EFV, BPR5EFV

21	Foundation - Core	Ind. Bearings: Maint. and Installation (BRG2EFV)	This training course teaches the basic installation and care of plain and roller-element bearings, provides examples of various types of fittings for installation, and explains how to check and adjust operating clearances and how to align bearings and equipment.	--
22	Foundation - Core	BRG1-Ind. Bearings: Application and Technology (BRG1EFV)	Bearings are a critical part of all machines. Understanding the function, operational factors and maintenance of bearings is critical to keeping machines operating at peak efficiency. This course teaches the student how to ensure a long life expectancy from the bearings.	--
23	Foundation - Core	BRG3-Ind. Bearings: Troubleshooting (BRG3EFV)	This training course explains the conditions affecting bearing performance, the causes and conditions leading to bearing failure, and how to inspect and identify bearing failure.	--
24	Foundation - Core	INS9-Lubrication System Inspection (INS9EFV)	Lubrication System Inspection	--
25	Foundation - Core	INS7-Belt Drive, Chain Drive & Gear Box Inspection (INS7EFV)	This course deals with belt, chain, and gear box inspection.	--
26	Foundation - Core	PNM6-Working Safely With Pneumatic Systems (PNM6EFV)	This training course explains the necessary precautions a worker must take regarding potential safety hazards associated with pneumatic systems and identifies safety rules that should be followed when working with pneumatic components.	
27	Foundation - Core	PNM3-Processing Air (PNM3EFV)	This training course teaches what are the primary components of the pneumatic system are and how each one functions independently and in coordination with the secondary components. It explains the structure of the compressors and the air tanks and how each component operates within an air distribution system. In addition, it defines how compressed air is stored and how to treat air of contaminants.	--

### FOUNDATION PROGRAM - SUPPLEMENTAL COURSES

	PROGRAM	COURSE TITLE & NUMBER	COURSE DESCRIPTION	PREREQUISITES
	Foundation - Supplemental	REA1-Basic Skills (REA1EFV)	REA1- Basic Skills	
	Foundation - Supplemental	REA2-Literal Comprehension: Main Idea (REA2EFV)	REA2- Literal Comprehension: Main Idea	
	Foundation - Supplemental	REA3-Relationships of Literal Comprehension (REA3EFV)	Relationships of Literal Comprehension	
	Foundation - Supplemental	REA4-Inference (REA4EFV)	REA4 - Inference	
	Foundation - Supplemental	REA5-Study Skills (REA5EFV)	Study Skills	
	Foundation - Supplemental	MCT1-Safety Procedures and Guidelines (MCT1EFV)	This course explains the safety procedures and guidelines on how to properly use, maintain, and calibrate various tools and machines found in the common machine shop.	
	Foundation - Supplemental	MCT2-Hand Tools and their Uses (MCT2EFV)	This Course deals with the hand tools commonly found in machine shops and their uses. Also, the safety measures to be followed when using the tools are covered.	
	Foundation - Supplemental	MCT10-Vertical Band Saws: Prts, Accs, & Operation (MCTAEFV)	This course deals with one of the vital tools of the modern machine shop, the vertical band machine. You will learn about the different parts of the band saw, using different bands and, how to saw, file and polish work pieces.	
	Foundation - Supplemental	MCT6-The Pedestal Grinder (MCT6EFV)	This Course deals with the hand tools commonly found in machine shops and their uses. Also, the safety measures to be followed when using the tools are covered.	
	Foundation - Supplemental	MCT7-Sharpening Drill Bits By Hand and Machine (MCT7EFV)	This course explains about sharpening drill bits by hand and machine.	
	Foundation - Supplemental	MCT9-Drill Press Operations (MCT9EFV)	This course deals with the safety issues to be considered when using the drill press.	
	Foundation - Supplemental	MCT8-Drill Presses: Sensitive and Radial (MCT8EFV)	This course deals with one of the basic tools of the modern machine shop, the power drill press.	
	Foundation - Supplemental	BEL10-Basic Engine Lathe: Drilling, Boring, and Reaming Work (BELAEFV)	This course provides solid content on how to drill, bore, and ream a work piece using the engine lathe.	
	Foundation - Supplemental	BEL1-Identification of Parts and Care (BEL1EFV)	This course helps you to learn the parts of the basic engine lathe, their functions, and maintenance requirements.	
	Foundation - Supplemental	BEL13-Basic Engine Lathe: Filing and Polishing (BELDEFV)	This course will teach you Basic Engine Lathe, Filing and Polishing	
	Foundation - Supplemental	BEL7-Three Methods of Facing Work to Length (BEL7EFV)	This course introduces Three Methods of Facing Work to Length	

Foundation - Supplemental	BEL9-Basic Engine Lathe: Straight Turning Between Centers (BEL9EFV)	This course discusses the methods of alignment and preparation of work pieces for turning between centers. It also describes the turning of a work piece between centers in detail.
Foundation - Supplemental	BEL11-Turning a Radius (BELBEFV)	This course will teach you the four common methods of turning a radius of a given work piece.
Foundation - Supplemental	BEL8-Straight Turning Work of Two Diameters (BEL8EFV)	This course introduces Straight Turning Work of Two Diameters
Foundation - Supplemental	BEL14-Basic Engine Lathe: Knurling (BELEEFV)	This course will teach you Basic Engine Lathe, Knurling
Foundation - Supplemental	BEL12-Basic Engine Lathe: Turning Tapers (BELCEFV)	This course describes the different types of tapers, their uses and the procedures for machining tapers.
Foundation - Supplemental	BEL3-Speed and Feed (BEL3EFV)	This course introduces workers to the basics of calculating cutting speeds and feeds for machining ferrous, non-ferrous, and plastic materials on the lathe.
Foundation - Supplemental	BEL2-Basic Engine Lathe: Accessories (BEL2EFV)	This course describes common engine lathe accessories and their purposes. It also discusses the maintenance and replacement of certain types of chucks.
Foundation - Supplemental	MCT4-The Vertical Milling Machine (MCT4EFV)	The vertical milling machine is one of the most versatile tools in the modern machine shop.
Foundation - Supplemental	BPR8 - Mechanical Connections (BPR8EFV)	This course explains the importance of sound mechanical connections, including fittings, wiring and tubing, to the process measurement and control of instrumentation systems.
Foundation - Supplemental	ELS1-Basic Principles (ELS1EFV)	This training course teaches the basic principles of electrical theory, what static electricity and magnetism are, a definition of Ohm's Law, a general description of basic electrical currents and circuits, and the differences between series and parallel ports.
Foundation - Supplemental	ELS2-Alternating Current (ELS2EFV)	This training course explains why alternating current is the most common form of commercially generated electricity; provides a description of AC circuits, discusses the different types and functions of AC generators, defines inductance and capacitance, and explains the operation of transformers.
Foundation - Supplemental	ACDC1-Current (ACD1EFV)	This course explains the basics of Current.
Foundation - Supplemental	ACDC2-Voltage (ACD2EFV)	This course explains the basics of electromotive force (EMF), its generation and measurement.
Foundation - Supplemental	ACDC3-Resistance (ACD3EFV)	This course explains the basics of resistance, its unit of measurement, resistors and its types. It also discusses the various means of connecting several resistors in a circuit.
Foundation - Supplemental	ACDC4-Ohm's Law (ACD4EFV)	This course explains how Ohm's law can be used to determine the current, voltage, and resistance. It also explains how Watt's law is used to determine the electrical power.

### CORNERSTONE PROGRAM - CORE COURSES

	PROGRAM	COURSE TITLE & NUMBER	COURSE DESCRIPTION	PREREQUISITES
1	Cornerstone-Core	ELS5-Installation, Distribution, Lighting (ELS5EFV)	To maintain the safe flow and precise control of electricity, facilities employ a distribution system that conforms with standards set by the National Electrical Code, or NEC. To keep the system working, it's important to know how each element functions and how the control and circuit protective devices combine for smooth distribution of electricity. This course demonstrates how electricity is distributed and controlled by a plant's electrical system.	
2	Cornerstone-Core	TRB2-Applications of Troubleshooting-Electrical Problems Part One (TRB2EFV)	This course identifies power distribution and typical problems that may occur in this equipment. The second part of the course introduces the student to fluorescent and high intensity discharge (HID) lighting and methods that may be applied in locating and repairing problems.	
3	Cornerstone-Core	TRB1-Troubleshooting Procedures (TRB1EFV)	This course helps us to identify symptoms and causes of motor problems, to test using an ohmmeter, to troubleshoot two and three-wire motor control systems, the operating procedure and the methods to troubleshoot variable frequency drives.	
4	Cornerstone-Core	TRB3-Maintenance Troubleshooting: Motors and Motor Controls (TRB3EFV)	This course helps us to identify symptoms and causes of motor problems, to test using an ohmmeter, to troubleshoot two and three-wire motor control systems, the operating procedure and the methods to troubleshoot variable frequency drives.	

5	Cornerstone-Core	PLC4-Troubleshooting (PLC4EFV)	Troubleshooting is fourth in a series of courses on Programmable Logic Controllers. This course teaches the basics of troubleshooting when problems arise with PLCs. It includes sections on troubleshooting devices and functions, indicator lights, program monitoring and forcing, analog fault register functions and use, and troubleshooting scenarios.	
6	Cornerstone-Core	MTR1-Basic Motor Controls & Relays (MTR1EFV)	This training course provides information vital to understanding modern motor control systems. It discusses the three categories of motor control types, their characteristics and location. It also explains the design of magnetic relays and discusses different types of relays and contacts, and the operation and function of metal oxide varistors and solid-state relays.	
7	Cornerstone-Core	MTR3-Motor Controls: Time Delay Relays (MTR3EFV)	This course teaches the different Time delay relays are used to separate or delay events and create a sequence or order of operation	
8	Cornerstone-Core	MTD3-Variable Speed AC Drives (MTD3EFV)	This training course addresses motor drive loop system fundamentals, types of feedback, the function of optical and magnetic encoders, and the materials they are made of. The purpose, benefits, and operation of the amplifier in a motor drive are also covered.	
9	Cornerstone-Core	BPR3 - Process Characteristics (Video) (BPR3EFV)	This course explains the basics of process systems, their characteristics and variables, types of energy, various temperature scales, and heat transfer methods.	
10	Cornerstone-Core	BPR7-Piping & Instrumentation Diagrams (BPR7EFV)	This course explains basic digital control concepts, including terminology, symbols, and designations found on process instrumentation diagrams.	
11	Cornerstone-Core	CPC1-Principles of Continuous Control (CPC1EFV)	Principles of Continuous Control	
12	Cornerstone-Core	BPR6-Instrumentation Loop Diagrams (BPR6EFV)	This course describes the organizational sections, symbols and reference information provided on a loop diagram and traces process flow on simple electronic and pneumatic loop diagrams.	
13	Cornerstone-Core	EMS12-Instrument Loop Troubleshooting (EMS12EFV)	This course shows the logical system of troubleshooting problems within process control loops.	
14	Cornerstone-Core	HDL6-Hydraulics: System Safety & Maintenance (HDL6EFV)	The Sixth Course in the Hydraulics series. The Hydraulic System Safety & Maintenance	
15	Cornerstone-Core	PRT3-Print Reading: Types and Symbols (PRT3EFV)	This course covers various types of mechanical drawings, including layout, detail, prefix, and assembly drawings, and explains general identification and revision symbols. It also covers surface texture symbols, welding and rivet symbols, as well as datums and miscellaneous markings.	
16	Cornerstone-Core	MPS1-Seals: Types Materials and Properties (MPS1EFV)	This training course teaches the basics about various types of industrial seals and the materials used to form them. Specific seals and applications covered included machinery seals, mechanical face seals, and compression packings.	
17	Cornerstone-Core	MPS2-Seals: Gaskets and Packing: Inspection and Inst. (MPS2EFV)	This training course teaches the basics of gasket and packing materials commonly in use and procedures for their installation. After viewing the course, students will understand the application of several different types of gaskets and packings, and the procedures for removing old gaskets, inspecting new ones, and correctly installing them.	
18	Cornerstone-Core	GG1-Industrial Drives: Gears and Gear Systems (GG1EFV)	Gears and Gear Systems - Concepts and Applications.	
19	Cornerstone-Core	PUM3-Cent.Pumps:Operation and Maint. (PUM3EFV)	This course covers the basics of operation and maintenance of centrifugal pumps.	
20	Cornerstone-Core	SJC1-Shaft Joining and Coupling Devices (SJC1EFV)	Shaft Joining and Coupling Devices.	
21	Cornerstone-Core	TRB4-Mechanical Troubleshooting Skills: Pumps and Compressors (TRB4EFV)	The main focus of this course is troubleshooting associated with mechanical problem, particularly those dealing with pumps and compressors. This course deals the problems with pumps and compressors, which include the electrical symptoms having mechanical failure or malfunction.	
22	Cornerstone-Core	CBR1-Types, Principles, and Functions (CBR1EFV)	Clutches and brakes, Troubleshooting.	
23	Cornerstone-Core	CBR2-Troubleshooting (CBR2EFV)	Clutches and brakes, Types and application.	
24	Cornerstone-Core	BOI1-Introduction to Boilers - An Overview (BOI1EFV)	Introduction to Boilers - An Overview	
25	Cornerstone-Core	BOI3-Feedwater and Steam (BOI3EFV)	Feedwater and Steam	

26	Cornerstone-Core	BOI5-Boiler Operations (BOI5EFV)	Boiler Operations	
27	Cornerstone-Core	HVAC1-Complete System Troubleshooting (HVC1EFV)	This training course provides a basic overview of heating and air conditioning systems, including: the operation of the vapor compression cycle; an introduction to the basic components of an HVAC system; a description of special tools necessary for diagnosing and troubleshooting heating and air conditioning system; techniques used to conduct a preliminary visual inspection; and an in-depth look at using pressure gauges to identify and correct a variety of problems.	
28	Cornerstone-Core	HVAC2-Air Handlers-Mechanical Systems (HVC2EFV)	This training course provides a basic overview of air handlers used in industrial HVAC systems, including: basic air handler functioning; common performance maintenance tasks; and routine troubleshooting procedures.	
29	Cornerstone-Core	INS3-Air Compression System Inspection (INS3EF)	Air Compression System Inspection	
30	Cornerstone-Core	PNM8-System Troubleshooting (PNM8EFV)	This training course explains how to systematically identify the problems of a pneumatic system, and determine the causes in order to solve the system problems in an efficient manner.	

### CORNERSTONE PROGRAM - SUPPLEMENTAL COURSES

	PROGRAM	COURSE TITLE & NUMBER	COURSE DESCRIPTION	PREREQUISITES
1	Cornerstone-Supplemental	PME1-Temperature 1: Thermometers and Thermocouples (PME1EFV)	This course introduces the student to what temperature is and how it explained in terms of operation.	
2	Cornerstone-Supplemental	CVA1-Basics and Function (CVA1EFV)	Control Valves and Actuators: Basics and Function	
3	Cornerstone-Supplemental	CVA2-Types and Design (CVA2EFV)	Control Valves and Actuators: Types & Design	
4	Cornerstone-Supplemental	CVA3-Fundamentals and Selection (CVA3EFV)	Control Valves and Actuators: Fundamentals and Selection	
5	Cornerstone-Supplemental	HDL2-The Hydraulic Circuit (HDL2EFV)	Hydraulic systems are designed to do work.	
6	Cornerstone-Supplemental	HDL3-The Hydraulic Pumps & Actuators (HDL3EFV)	The third Course in the Hydraulics series. Pumps and Actuators.	
7	Cornerstone-Supplemental	HDL4-Hydraulics: Control Valves (HDL4EFV)	Hydraulics: Control Valves	
8	Cornerstone-Supplemental	HDL7-The Hydraulic Systems Troubleshooting (HDL7EFV)	The seventh Course in the Hydraulics series. The Hydraulic Systems Troubleshooting	
9	Cornerstone-Supplemental	HVAC6-Cooling Towers-Maint. & Troubleshooting (HVC6EFV)	This course teaches how to conduct regular preventive maintenance on cooling tower systems. It includes cooling tower principles, water and air flow maintenance, structural checks, mechanical inspection and maintenance and water treatment plans. Students also learn how to troubleshoot some of the problems common to cooling towers.	
10	Cornerstone-Supplemental	HVAC7-Condensers-Maint. and Troubleshooting (HVC7EFV)	This training course provides a basic overview of the operation of condensers used in industrial HVAC systems, and provides information about common maintenance and troubleshooting tasks.	
11	Cornerstone-Supplemental	TRB5-Mechanical Troubleshooting Skills: Hydraulic Circuits and HVAC (TRB5EFV)	This course mainly focuses on the problematic symptoms of and troubleshooting techniques associated with hydraulic circuits and HVAC.	
12	Cornerstone-Supplemental	PUM4-Cent.Pumps:Trblshtg and Disassembly (PUM4EFV)	This course covers the basics of troubleshooting and the disassembly of centrifugal pumps.	
13	Cornerstone-Supplemental	PUM5-Cent. Pump Reassembling and Installation (PUM5EFV)	This course deals with reassembling and installation procedures of centrifugal pumps.	
14	Cornerstone-Supplemental	PNM7-Pneumatic System Maintenance (PNM7EFV)	This training course explains the importance of a pneumatic system proactive maintenance program and the differences between the tasks that are to be performed during a predictive and preventive maintenance program.	

### CAPSTONE PROGRAM - CORE COURSES

	PROGRAM	COURSE TITLE & NUMBER	COURSE DESCRIPTION	PREREQUISITES
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1	Capstone - Core	MTD5-AC Motor Operation (MTD5EFV)	This training course teaches the basics about how three-phase induction motors operate and how their operation can be controlled. After viewing the course, students will understand how rotating magnetic fields are created in a three-phase motor; how these fields transfer energy to a load; the relationship between speed, torque, and horsepower; and how speed, torque, and horsepower are affected by frequency, voltage, and current.	
2	Capstone - Core	MTD6-AC Drive Selection and Setup (MTD6EFV)	This course covers the basics of AC motor drive selection and setup. Upon completion of this course, students should be able to select a motor drive and set up its basic operating programs, as well as interpret some common command functions presented in a manufacturer's manual. In addition, students should understand how to select and set up a drive to meet a specific application, program control requirements for drive setup, and select some of the common parameters used in AC motor drives.	
3	Capstone - Core	CLX3-ControlLogix: Creating and Using Tags and the Program Editor (CLX3EF)	This section gives a detailed explanation on tags and explains the steps taken to create a new controller tag. It also explains about three step scan cycle.	
4	Capstone - Core	CLX4-ControlLogix: Basic Instructions (CLX4EF)	This course introduces and explains the purpose of the basic ControlLogix instructions such as Bit instructions, Timer/Counter instructions, Compare instructions, Move/Logical instructions, Math Conversion instructions and Program Control instructions.	
5	Capstone - Core	CLX5-ControlLogix:Advanced Programming and Analog Devices (CLX5EF)	This course describes the basic explanations of program control instructions. It also explains on analog devices and analog module configuration.	
6	Capstone - Core	RSX1-Configuring Hardware and Software (RSX1EFV)	This training course teaches the foundational steps that are necessary for using the RSLogix™ programming software on a laptop or desktop computer with a PLC5 or SLC500 series programmable logic controller.	
7	Capstone - Core	RSX2-Programming and Editing (RSX2EFV)	This training course teaches how to utilize the functions most commonly used in programming with the RSLogix™ software. It explains how to create new projects, new files, and add instructions to the ladder logic. It also describes how to edit the ladder offline and online.	
8	Capstone - Core	RSX3-Testing/Troubleshooting Functions (RSX3EFV)	This training course explains how to use some advanced functions of the RSLogix™ software. It shows how to use the force function, data monitor, histograms, searches, and trend plots to aid in troubleshooting or testing of the program. It also explains how to properly configure an intelligent module for use with non-discrete applications.	
9	Capstone - Core	ELS6-Generators and Motors (ELS6EFV)	This course teaches about the generators and motors used in industrial applications. It explains how generators and motors operate, the different types of motors and generators and basic troubleshooting techniques.	
10	Capstone - Core	CVA4-Sizing and Installation (CVA4EFV)	Control Valves and Actuators: Sizing and Installation	
11	Capstone - Core	BOI4-Boiler Fuel and Air – Controlling for Safety and Efficiency (BOI4EFV)	Boiler Fuel and Air – Controlling for Safety and Efficiency	
12	Capstone - Core	THM1-Thermography-Basic Operation (THM1EFV)	This module discusses how thermography is a non-invasive method for testing equipment. describe infrared energy, its behavior, and how it is used in a predictive maintenance program; list the different types of heat transfer; discuss the principles of thermography; identify the equipment used to record thermographic images; and describe the basic considerations for taking thermographic measurements.	
13	Capstone - Core	THM2-Thermography-Operating Proc. & Impl (THM2EFV)	This module discusses how using thermography provides an early indication of the status of your equipment. Discuss the characteristics and capabilities of thermal imagers, explain the basic steps for conducting a condition-based infrared monitoring program, identify the correct procedures for working with infrared imaging equipment, discuss the thermal behavior of target materials, ask the right questions when choosing thermographic equipment.	

14	Capstone - Core	THM3-Thermography-Practical Application (THM3EFV)	This module discusses how thermography aids in the monitoring of electrical and mechanical systems and how it can be applied to a maintenance program. Understand how thermography is used in variety of applications, list various causes of electrical problems that can be identified with thermography, list uses of thermography in condition-based monitoring of machinery, furnace and boiler systems, and other industrial equipment, understand how thermography enables you to locate and evaluate problems related t	
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### CAPSTONE PROGRAM - SUPPLEMENTAL COURSES

	PROGRAM	COURSE TITLE & NUMBER	COURSE DESCRIPTION	PREREQUISITES
	Capstone - Supplemental	PRT1-Print Reading: Orthographic Proj. (PRT1EFV)	This course explains the history of mechanical print and covers the six principal views, types of lines used in drawings, sectional views, and the differences between first and third angles.	
	Capstone - Supplemental	DCC1-DC Motor Controllers - Controller Function and Operation (DCC1EFV)	DC Motor Controllers- Controller Function and Operation	
	Capstone - Supplemental	DCC2-DC Motor Controllers-Maintenance and Troubleshooting (DCC2EFV)	DC Motor Controllers-2	
	Capstone - Supplemental	DCM1-DC Motors: Basics and Internal Parts of DC Motors (DCM1EFV)	DC Motors: Basics and Internal Parts of DC Motors	
	Capstone - Supplemental	DCM2-DC Motors: Wiring Diagrams and Troubleshooting (DCM2EFV)	DC Motors: Wiring Diagrams and Troubleshooting	
	Capstone - Supplemental	ACDC13-AC/DC Electronics: Transformers (ACDDEFV)	This course deals with the transformers and explains the transformer operations, transformer efficiency, uses and other types.	
	Capstone - Supplemental	MTD4-Servo and Stepper Motors (MTD4EFV)	This course teaches the basics of servo and stepper motors, the types of drives they use, their components, and applications.	
	Capstone - Supplemental	PLC2-Programming (PLC2EFV)	This course teaches how to develop a ladder diagram and load it into the PLC memory.	
	Capstone - Supplemental	PLC5-Communications and Advanced Programming (PLC5EFV)	This course teaches advanced programming techniques and communications of PLCs.	
	Capstone - Supplemental	PNM5-Pneumatic Control Valves (PNM5EFV)	This training course explains the function of the pneumatic control valves and how they operate within a pneumatic system in order for the actuators to operate properly.	
	Capstone - Supplemental	USA3-Mechanical and Electrical Inspection (USA3EFV)	This training course teaches the proper procedures for detecting bearing failures and problems with electrical systems.	