

**Central Carolina Community College  
Program Planning Guide**

**Industrial Systems Technology  
Credential: Diploma in Industrial Systems Technology (D50240)**

The Industrial Systems Technology curriculum is designed to prepare or upgrade individuals to safely service, maintain, repair and install equipment. Instruction includes theory and skill training needed for inspecting, testing, troubleshooting, and diagnosing industrial systems. Students will learn multi-craft technical skills in blueprint reading, mechanical systems maintenance, electricity, hydraulics/pneumatics, welding, machining or fabrication, as well as various diagnostic and repair procedures. Practical application in these industrial systems will be emphasized and additional advanced coursework may be offered.

Upon completion of this curriculum, graduates should be able to individually, or with a team, safely install, inspect, diagnose, repair, and maintain industrial process and support equipment. Students are encouraged to develop life-long learning skills.

Program Length: 3 semesters

Career Pathway Options: Associate in Applied Science in Industrial Systems Technology (Higher entrance standards required);

Diploma in Industrial Systems Maintenance Technology

Program Sites: Lee Campus - Day Program

Suggested Course Schedule:	HOURS			Grade	Semester	Notes
	Class	Lab	Credit			
<b>1st Semester (Fall)</b>						
BPR 111	Blueprint Reading	1	2	2		
ELC 112	DC/AC Electricity	3	6	5		
MEC 111	Machine Processes I	1	4	3		
MNT 110	Intro to Maintenance Procedures	1	3	2		
WLD 112	Basic Welding Processes	1	3	2		
	Humanities/Fine Arts Elective	3	0	3		
		10	18	17		
<b>2nd Semester (Spring)</b>						
CIS 111	Basic PC Literacy	1	2	2		
ELN 229	Industrial Electronics	3	3	4		
ENG 102*	Applied Communication II	3	0	3		
HYD 110	Hydraulics/Pneumatics	2	3	3		
WLD 115	SMAW (Stick) Plate	2	9	5		
		11	17	17		
<b>3rd Semester (Summer)</b>						
AHR 120	HVACR Maintenance	1	3	2		
BPR 115	Electric/Fluid Power Diagrams	1	2	2		
ISC 110	Workplace Safety	1	0	1		
<b>OR</b> ISC 112	Industrial Safety	2	0	2		
MAT 101*	Applied Mathematics I	2	2	3		
<b>OR</b> PHY 121	Applied Physics I	3	2	4		
See Below	Technical Elective			2		
		5/6/7	7	10/11/12		
<b>Technical Elective (Choose 2/3 SHC)</b>						
COE 112	Co-op Work Experience I	0	20	2		
MNT 111	Maintenance Practice	2	2	3		

\*Not transferable to the AAS Degree

Total Semester Hours Credit: 44/47

**Course Descriptions:**

Revised July 2011

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**AHR 120 HVACR Maintenance 1-3-2**

This course introduces the basic principles of industrial air conditioning and heating systems. Emphasis is placed on preventive maintenance procedures for heating and cooling equipment and related components. Upon completion, students should be able to perform routine preventive maintenance tasks, maintain records, and assist in routine equipment repairs.

**BPR 111 Blueprint Reading 1-2-2**

This course introduces the basic principles of blueprint reading. Topics include line types, orthographic projections, dimensioning methods, and notes. Upon completion, students should be able to interpret basic blueprints and visualize the features of a part.

**BPR 115 Electric/Fluid Power Diagrams 1-2-2**

This course covers sketching of detail and assembly drawings and reading of hydraulic, pneumatic, electrical, mechanical, and piping schematics. Emphasis is placed on interpretation and communication skills utilizing sketches, symbols, diagrams, and other related topics. Upon completion, students should be able to read, demonstrate an understanding of, and draw sketches and schematics commonly used in industry.

**CIS 111 Basic PC Literacy 1-2-2**

This course provides an overview of computer concepts. Emphasis is placed on the use of personal computers and software applications for personal and fundamental workplace use. Upon completion, students should be able to demonstrate basic personal computer skills.

**COE 112 Co-op Work Experience I 0-20-2**

This course provides work experience with a college-approved employer in an area related to the student's program of study. Emphasis is placed on integrating classroom learning with related work experience. Upon completion, students should be able to evaluate career selection, demonstrate employability skills, and satisfactorily perform work-related competencies.

**ELC 112 DC/AC Electricity 3-6-5**

This course introduces the fundamental concepts of and computations related to DC/AC electricity. Emphasis is placed on DC/AC circuits, components, operation of test equipment, and other related topics. Upon completion, students should be able to construct, verify, troubleshoot, and repair DC/AC circuits.

**ELN 229 Industrial Electronics 3-3-4**

*Local Prerequisite: ELC 112, ELC 131, or ELC 140*

This course covers semiconductor devices used in industrial applications. Topics include the basic theory, application, and operating characteristics of semiconductor devices. Upon completion, students should be able to install and/or troubleshoot these devices for proper operation in an industrial electronic circuit.

**ELN 231 Industrial Controls 2-3-3**

*Local Prerequisite: ELC 112, ELC 131, or ELC 140*

This course introduces the fundamental concepts of control of rotating machinery and associated peripheral devices. Topics include rotating machine theory, ladder logic, electromechanical and solid state relays, motor controls, pilot devices, three-phase power systems, and other related topics. Upon completion, students

should be able to interpret schematics and demonstrate an understanding of electromechanical and electronic control of rotating machinery.

**ENG 102 Applied Communications II 3-0-3**

*Prerequisites: RED 080 and ENG 090 or appropriate placement test scores*

This course is designed to enhance writing and speaking skills for the workplace. Emphasis is placed on generating short writings such as job application documents, memoranda, and reports and developing interpersonal communication skills with employees and the public. Upon completion, students should be able to prepare effective, short, and job-related written and oral communications. The computer is used as a writing and design tool for this course. This is a diploma-level course.

**HYD 110 Hydraulics/Pneumatics I 2-3-3**

This course introduces the basic components and functions of hydraulic and pneumatic systems. Topics include standard symbols, pumps, control valves, control assemblies, actuators, FRL, maintenance procedures, and switching and control devices. Upon completion, students should be able to understand the operation of a fluid power system, including design, application, and troubleshooting.

**ISC 110 Workplace Safety 1-0-1**

This course introduces the basic concepts of workplace safety. Topics include fire, ladders, lifting, lock-out/tag-out, personal protective devices, and other workplace safety issues related to OSHA compliance. Upon completion, students should be able to demonstrate an understanding of the components of a safe workplace.

**ISC 112 Industrial Safety 2-0-2**

This course introduces the principles of industrial safety. Emphasis is placed on industrial safety, OSHA, and environmental regulations. Upon completion, students should be able to demonstrate knowledge of a safe working environment and OSHA compliance.

**MAT 101 Applied Mathematics I 2-2-3**

*Prerequisite: Take one: MAT 060, MAT 070, MAT 080, MAT 090, MAT 095, or appropriate placement test scores*

This course is a comprehensive review of arithmetic with basic algebra designed to meet the needs of certificate and diploma programs. Topics include arithmetic and geometric skills used in measurement, ratio and proportion, exponents and roots, applications of percent, linear equations, formulas, and statistics. Upon completion, students should be able to solve practical problems in their specific areas of study. This course is intended for certificate and diploma programs.

**MEC 111 Machine Processes I 1-4-3**

This course introduces shop safety, hand tools, machine processes, measuring instruments, and the operation of machine shop equipment. Topics include use and care of tools, safety, measuring tools, and the basic setup and operation of common machine tools. Upon completion, students should be able to manufacture simple parts to specified tolerance.

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### **MNT 110 Introduction to Maintenance Procedures 1-3-2**

This course covers basic maintenance fundamentals for power transmission equipment. Topics include equipment inspection, lubrication, alignment, and other scheduled maintenance procedures. Upon completion, students should be able to demonstrate knowledge of accepted maintenance procedures and practices according to current industry standards.

### **MNT 111 Maintenance Practices 2-2-3**

This course provides in-depth theory and practical applications relating to predictive and preventive maintenance programs. Emphasis is placed on equipment failure analysis, maintenance management software, and techniques such as vibration and infrared analysis. Upon completion, students should be able to demonstrate an understanding of modern analytical and documentation methods.

### **PHY 121 Applied Physics I 3-2-4**

*Prerequisite: MAT 060 or appropriate placement test scores.*

This algebra-based course introduces fundamental physical concepts as applied to industrial and service technology fields. Topics include systems of units, problem solving methods, graphical analyses, vectors, motion, forces, Newton's laws of motion, work, energy, power, momentum, and properties of matter. Upon completion, students should be able to demonstrate an understanding of the principles studied as applied in industrial and service fields.

### **WLD 112 Basic Welding Processes 1-3-2**

This course introduces basic welding and cutting. Emphasis is placed on beads applied with gases, mild steel fillers, and electrodes and the capillary action of solder. Upon completion, students should be able to set up welding and oxy-fuel equipment and perform welding, brazing, and soldering processes.

### **WLD 115 SMAW (Stick) Plate 2-9-5**

This course introduces the shielded metal arc (stick) welding process. Emphasis is placed on padding, fillet, and groove welds in various positions with SMAW electrodes. Upon completion, students should be able to perform SMAW fillet and groove welds on carbon plate with prescribed electrodes.