

INTEGRATED SYSTEMS TECHNOLOGY

Program Description

The Integrated Systems Technology (IST) industrial training program provides students with the critical skills required by systems technicians in modern industry. The IST program is North Central Association of Colleges and Schools (NCA) accredited and ISO-9000 certified. The program is offered as a full time 900 hour one year program, as well as a part time, two year 900 hour program.

The IST program includes the following courses:

IST3126 Advanced Hydraulics IST3271 Introduction to Noise, Vibration and Harshness Principles
IST 3121 Advanced Pneumatics IST 3120 Introduction to Pneumatics
IST3252 Applied Automation Principles IST3460 Introduction to Welding
IST3080 Basic Computer Training IST3410 Mechanical Blueprint Reading
IST3150 Basic Electrical AC and DC Theory IST 3141 Mechanical Systems and Principles 1
IST3470 Basic Process Control IST3142 Mechanical Systems and Principles 2
IST3110 Business English IST3143 Mechanical Systems and Principles 3
IST3115 Industrial Mathematics IST3101 Metrology
IST 3140 Industrial Safety and Health IST3151 Motor Controls I
IST3325 Introduction to Computer Aided Design (CAD) IST3152 Motor Controls II
IST 3225 Introduction to Electronics IST3251 Programmable Logic Controls (PLC) Level 1
IST 3225 Introduction to Electronics IST3251 Programmable Logic Controls (PLC) Level 2
IST 3125 Introduction to Hydraulics IST3320 Total Productive Maintenance Practices (TPM)
IST3420 Introduction to Machining

ADDITIONAL IST COURSE OFFERINGS

10IST3326 Advanced Auto-CAD
10IST3470 HVAC Trainer and Troubleshooting Course

Any of the courses are available on an individual basis to give you the latest training in your desired field. Classes offered at Ohio Hi-Point Career Center and at our campus in Urbana.

Concurrent enrollment through Clark State Community College provides Integrated Systems Technology students with 23 hours of college credit upon completing their program.

Foundational Courses

Industrial Safety and Health – 20 Hours

Course: IST 3140

Hours: 20

An introduction to industrial safety practices, lockout/tag out procedures, terminology, safety regulations and requirements. Classroom based training.

Industrial Mathematics

Course: IST 3115

Hours: 30

Application of mathematical concepts to the manufacturing and maintenance of products and processes. Self-paced lab activity.

Basic Computer Applications

Course: IST 3080

Hours: 30

Fundamental concepts of the PC, operating systems, and networks. Hands on training in the use of word processing, spreadsheet, and database programs to prepare reports and make presentations. Instructor led course.

Total Productive Maintenance Practices

Course: IST 3320

Hours: 15

introduces TPM topics including the difference between planned and un-planned maintenance, 5S philosophy, five different types of maintenance practices, Overall Equipment Effectiveness (OEE) calculations and the Pillars of TPM. Instructor led course.

Business English

Course: IST 3110

Hours: 30

Review of basic writing skills and grammar with an emphasis on technical writing skills. Microsoft Word is used to develop the tools and formats for reports, memos, and other technical writing. Lab based utilizing a workbook and PC with instructor interaction.

Electrical Courses

Basic Electrical AC and DC Circuits

Course: IST 3150

Hours: 40

Introduction to alternating and direct current circuits utilizing Amatrol laboratory equipment along with multimedia computer based training. Multiple hands on laboratory exercises are included, which focus on the construction of electrical circuits. Circuits are tested using electrical test equipment. Topics include Ohm's Law, series and parallel circuits, resistors, capacitors, inductors, relays, transformers and other electrical components.

Introduction to Electronics

Course: IST 3225

Hours: 20

Introduction to the function and operation of basic electronic components. Topics include resistor values, bread board and construction of electronic circuits, function and troubleshooting of electronic components including diodes, SCR 's, TRIAC's, transistors, potentiometers, capacitors, resistors and bridge rectifiers. Utilizes ANGEL online learning suite.

Motor Controls I

Course: IST 3151

Hours: 40

This course focuses on relay control of electric motor and pneumatic systems and their industrial applications. Students use a variety of industrial relay control circuits, schematics, ladder diagrams and Boolean logic to learn industry-relevant skills in installation, operation and performance analysis of motor controls systems.

Motor Controls II

Course: IST 3152

Hours: 40

This course gives the student a real world experience of troubleshooting and repair of motor control systems using a multi-meter in a three phase motor control system. The student learns to diagnose and repair problems in wiring, relays, transformers, switches, power supplies, variable speed drives and motors.

Basic Process Quality Control

Course: IST 3470

Hours: 30

Introduction to process control systems, instrument tags, piping and instrumentation diagrams, loop controllers, final control elements, level measurement, liquid level control, methods of automatic control, flow measurement and

control and control loop performance. Emphasis on electronic instrumentation set-up and use.

Fluid Power Courses

Introduction to Hydraulics

Course: IST 3125

Hours: 30

Introduction to hydraulic schematics, filters, regulators, relief valves, motors, pumps and control of hydraulic components. Utilizes Amatrol laboratory equipment along with multimedia computer based training. Includes many hands on laboratory exercises.

Advanced Hydraulics

Course: IST 3126

Hours: 30

This advanced course covers directional control valves, solenoid valves, hydraulic schematics, interfacing valves to electrical control circuits and maintenance of hydraulic systems. Utilizes Amatrol laboratory equipment along with multimedia computer based training. Extensive laboratory exercises.

Introduction to Pneumatics

Course: IST 3120

Hours: 30

Introduction to the fundamentals of fluid power. Utilizes Amatrol laboratory equipment along with multimedia computer based training. Topics include pneumatic schematics, filters, lubricators, regulators, valves, cylinders, gauges, check valves and flow control valves. Includes multiple hands on laboratory exercises.

Advanced Pneumatics

Course: IST 3121

Hours: 30

This advanced course covers directional control valves, solenoid valves, cam valves, pneumatic schematics, interfacing valves to electrical control circuits and maintenance of pneumatic systems. Utilizes Amatrol laboratory equipment along with multimedia computer based training. Extensive laboratory exercises.

Mechanical Courses

Mechanical Systems and Principles 1

Course: IST 3141

Hours: 40

Basics of mechanical power transmission, rotary power, safety, mechanical foundations, fasteners, leveling, bearings, alignment of v-belts, chain drives, couplings, and gear drives. Extensive laboratory exposure to mechanical drives, motors, tools and measuring instruments. Utilizes Ametrol laboratory equipment along with multimedia computer based training.

Mechanical Systems and Principles 2

Course: IST 3142

Hours: 40

Advanced mechanical course in heavy duty belt drive systems, synchronous belt systems, lubrication concepts, precision shaft alignment, precision coupling systems and heavy duty chain drive systems. Extensive laboratory exposure to mechanical drives, motors, tools and measuring instruments.

Mechanical Systems and Principles 3

Course: IST 3143

Hours: 40

Advanced mechanical course in bearing types and applications, gaskets and seals, advanced gear drives, brakes and clutches, linear drives and ball screw drives. Extensive laboratory exposure to mechanical drives, motors, tools and measuring instruments.

Introduction to Noise, Vibration and Harshness Principles

Course: IST 3271

Hours: 30

Advanced course in the use of vibration analysis to determine where and how to perform maintenance on a machine. Demonstrates how vibration analysis is used to increase machine reliability and reduce downtime as part of a Total Productive Maintenance (TPM) program. Extensive laboratory exposure to vibration analysis equipment.

Programmable Logic Controllers Courses

Programmable Logic Controllers 1

Course: IST 3250

Hours: 50

Utilizes Allen-Bradley SLC500 Programmable Controller and Amatrol simulation equipment along with multimedia computer based training. Topics include PLC programming, motor control, I/O interfacing, event sequencing and application development. Laboratory exercises provide many opportunities for the student to design and test PLC programs using timers, counters and various I/O devices. Also available with the Allen Bradley Control Logix 5500/RSLogix 5000 PLC.

Programmable Logic Controllers Level 2

Course: IST 3251

Hours: 30

Advanced course in networking PLCs and troubleshooting PLC problems with the Allen Bradley Control Logix 5500/RSLogix 5000 PLC.

Applied Automation Principles

Course: IST 3252

Hours: 40

Advanced industrial controls course that utilizes an automated production system that incorporates networked Allen Bradley MicroLogix 1500 PLCs, Device Net, a vision system, Mitsubishi robot, material handling conveyor and other electromechanical devices. This course is designed to enhance the troubleshooting skills of technicians who have mastered the basics of industrial controls.

Computer Software Courses

Introduction to Computer Aided Design

Course: IST 3325

Hours: 55

Introduction to the basics of Orthographic drawings and the basics in using CAD tools. Fundamentals include drawing tools, dimensioning, text insertion, CAD design and drawing modifications. Lab based utilizing a workbook and PC with instructor interaction.

Advanced Auto-CAD

Course: *11IST3326

Hours: 40

Focuses on advanced tools and features in AutoCad

SolidWorks

Course: *11IST3335

Hours: 8 (on-line)

In this on-line course, students learn basic and advanced SolidWorks applications including 2D and 3D modeling creation and features, production drawings and exploded views.

Advanced SolidWorks

Course: *11IST3336

Hours: 6 (on-line)

This on-line course covers advanced mates and exploded views, an introduction to animation, solid modeling creation and features.

Machining and Welding Maintenance Courses

Metrology

Course: IST 3101

Hours: 20

Introduction to the use of precision measurement tools including calipers, micrometers, scales, dial indicators, and others.

Mechanical Blueprint Reading

Course: IST 3410

Hours: 30

Introduction to the fundamentals of blueprint reading, symbols, orthographic projection, linear and angular dimensioning, coordinate tolerancing systems, sectional views, welding symbols and interpretation of drawing specifications.

Introduction to Machining

Course: IST 3420

Hours: 40

Introduction to the basics of machining. Includes machine safety, proper care of equipment, manual lathes, milling machines, and surface grinders. Two precision parts are machined using a blueprint. Finished parts must fit together and meet tolerance requirements. Instructor lead lab activity.

Introduction to Welding

Course: IST 3460

Hours: 40

Introduction to the basics of Oxyacetylene Welding and Cutting

(OAW, OAC), Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW or MIG), Gas Tungsten Arc Welding (GTAW or TIG), Flux Cored Arc Welding (FCAW).. Course contents include safety; common welding techniques on different weld joints; surface preparation and grinding; plus metal identification and filler compatibility. Practices include material thicknesses from 16 ga. thru 1/2 inch on steel and aluminum in a variety of positions. Can also be customized for an indepth training in one or two areas.

CNC Machining

Course: *11IST2200

Hours: 80

Students learn the basics of CNC mill and lathe machining operations.

Additional Courses

11IST3470 HVAC Trainer and Troubleshooting Course – 30 Hours

Course: *11IST2200

Hours: 80

Teaches HVAC basics and troubleshooting

All of these courses are available on an individual basis to give you the latest training in your desired field or as part of a 900 hour certificate program. Classes are offered at Ohio Hi-Point Career Center and at our satellite site in Urbana.

Concurrent enrollment through Clark State Community College provides Integrated Systems Technology students with 23 hours of college credit upon completing a 900 hour certificate program. Students also earn Manufacturing Skills Standards Council (MSSC) certification.

*Indicates an elective in the 900 hour program.

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