

ELECTRICAL AND INSTRUMENTATION

Overview

Electrical and Instrumentation Apprenticeship

Program Code: 50-414-2

For more information: www.wctc.edu/electrical-inst (<http://www.wctc.edu/electrical-inst/>)

Learn to install, troubleshoot and maintain plant lighting equipment and receptacle circuits, motors, starters, motor control centers, programmable controllers, control panels, electrical control systems and transformers. Learn to service high voltage electrical systems in accordance with relevant codes. Learn to install, calibrate, test and repair electronic equipment.

The minimum required course grades and program grade point average (GPA) for students under this catalog are:

Core Courses = C

Program GPA = 2.0

Build your degree along a career pathway. Start with a couple of courses or an entry-level credential to enter the job market in your area of interest, then continue with higher credentials on your educational path for job advancement and higher wages.

Career Pathway

1. Electrical and Instrumentation Apprenticeship
2. Technical Studies - Journeyworker

Learning Outcomes

Program Outcomes

1. Apply AC and DC theory to an industrial setting.
2. Apply the National Electric Code requirements to industrial equipment and facilities.
3. Apply operational and troubleshooting principles to a transformer installation.
4. Maintain electric motors and motor controls.
5. Test solid state electronic system components.
6. Apply operational and troubleshooting principles to power systems and variable speed drives.
7. Apply operational and troubleshooting principles to programmable logic controllers and
8. automation equipment.
9. Apply operational and troubleshooting principles to fluid power systems.
10. Interpret industrial equipment drawings and electrical prints.
11. Apply operational and troubleshooting principles to process control systems.
12. Communicate trade and occupational related information effectively.

Critical Life Skills

To help our students prepare for success in a workplace and society that is **increasingly global, multi-cultural, and collaborative**, all students are given opportunities to develop and demonstrate Critical Life Skills, both in and out of the classroom. The following Critical Life Skills are learning outcomes for WCTC students.

- **Communication:** Demonstrate appropriate communication.
- **Critical Thinking/Problem Solving:** Demonstrate critical thinking skills to analyze situations and solve problems.
- **Relationships:** Demonstrate effective interpersonal skills.
- **Self-management:** Demonstrate responsible and respectful behavior.

Required Courses

Code	Title	Credits
Core Courses		
413-510	IE Apprentice Code Review	1
413-523	Industrial Data Communication	2
413-524	IE DC Circuit Analysis	1.5
413-525	IE AC Circuit Analysis	1.5
413-526	NEC Overview	1
413-527	IE Transformers	1.5
413-528	IE Motors and Generators	1.5
413-529	NEC In Depth	1
413-533	IE Raceways Control Drawings	1.5
413-534	IE Electronics	1.5
413-535	NEC NFPA 70 and 79	1
413-536	IE Electromechanical Control 1	2
413-537	IE Electromechanical Control 2	2
413-538	IE Variable Speed Drives 1	2
413-539	IE Variable Speed Drives 2	2
413-540	IE PLC 1	1.5
413-541	IE PLC 2	1.5
414-722	E&I Troubleshooting Elec Sys	1
414-725	E&I Intro Indust Automated Sys	1
414-726	E&I Instrumentation Proc Ctrl	2
414-727	E&I Measurement and Process	2
414-728	E&I Appl Process Ctrl Capstone	2
419-501	Apprentice Hydraulics	1
Approved Substitute: 612-310		
419-502	Pneumatics for Apprentices	1
Approved Substitutes: 612-315 OR 419-104		

Total Credits **36**

Full-time Plan

First Year

Fall Term 1		Credits
413-524	IE DC Circuit Analysis	1.5
413-525	IE AC Circuit Analysis	1.5
413-526	NEC Overview	1
Credits		4

Spring Term 1

413-527	IE Transformers	1.5
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413-528	IE Motors and Generators	1.5
413-529	NEC In Depth	1
Credits		4
Second Year		
Fall Term 1		
413-533	IE Raceways Control Drawings	1.5
413-534	IE Electronics	1.5
413-535	NEC NFPA 70 and 79	1
Credits		4
Spring Term 1		
413-536	IE Electromechanical Control 1	2
413-537	IE Electromechanical Control 2	2
Credits		4
Third Year		
Fall Term 1		
413-538	IE Variable Speed Drives 1	2
413-539	IE Variable Speed Drives 2	2
Credits		4
Spring Term 1		
413-540	IE PLC 1	1.5
413-541	IE PLC 2	1.5
419-501	Apprentice Hydraulics	1
Credits		4
Fourth Year		
Fall Term 1		
413-510	IE Apprentice Code Review	1
413-523	Industrial Data Communication	2
419-502	Pneumatics for Apprentices	1
Credits		4
Spring Term 1		
414-722	E&I Troubleshooting Elec Sys	1
414-725	E&I Intro Indust Automated Sys	1
414-726	E&I Instrumentation Proc Ctrl	2
Credits		4
Fifth Year		
Fall Term 1		
414-727	E&I Measurement and Process	2
414-728	E&I Appl Process Ctrl Capstone	2
Credits		4
Total Credits		36