

**Program Number 50-620-1**  
**5-Year Contract**

**Work Hours (including related instruction): 10,000**  
**Related Instruction: 864 hours • Night School: 8 hours**

### ABOUT APPRENTICESHIP

Apprenticeships are employer-sponsored training programs. You must have a contract before being invited to school. A special application process is used for these programs. Please contact the Apprenticeship Office for the proper forms. Apprenticeship means you earn while you learn. If you want a career in a skilled trade, apprenticeship is the best way to get there. You'll combine on-the-job training with on-campus learning—you'll have the best of both worlds when it comes to learning the skills you need to get ahead. And even better, you'll earn a paycheck while you learn those skills.

### ABOUT THE CAREER

This occupation requires combined knowledge of electrical, electronic and mechanical systems used in industrial plants. Workers frequently support automation and robotic technologies. Work processes include installing, repairing, and maintaining equipment/devices. Troubleshooting systems involved in manufacturing and process control are critical requirements for workers in these occupations. Workers typically operate and debug industrial computer and communication systems including PLC's, PC's, and HMI technologies. Workers machine metal and other materials; fabricate parts and weld/join components. Documenting work performed, maintaining accurate records, and working in a collaborative environment are critical interpersonal skills. Employees in some, but not all plants, support facilities, utilities and grounds.

### INDUSTRIAL APPRENTICE APPLICATION REQUIREMENTS

- Determined by employer
- Wisconsin Apprentice Contract

### PROGRAM OUTCOMES

- Perform work safely.
- Install mechanical equipment.
- Install electrical equipment.
- Maintain mechanical equipment.
- Troubleshoot mechatronic systems.
- Operate machine shop tools and machines.
- Weld and fabricate parts.
- Maintain automation systems.
- Modify devices and systems.
- Maintain documents and records.
- Local options and work processes.

### APPROXIMATE COSTS

Contact the LTC Apprenticeship Office or visit [www.gotoltc.edu/apprenticeship](http://www.gotoltc.edu/apprenticeship) for detailed information.

### SPECIAL NOTE

You must have a sponsoring employer and contract before attending school.

### CAREER & EDUCATION ADVANCEMENT OPPORTUNITIES

LTC credits transfer to over 30 universities. For more information visit [gotoltc.edu/future-students/transfer](http://gotoltc.edu/future-students/transfer).

Catalog No.	Class Title	Credit(s)
<b>Term 1</b>		
50620701	Trades Math Review for Mechatronics	1
50620703	DC Electricity for Mechatronics	1
50620704	AC Electricity for Mechatronics	1
50620706	Electrical Codes for Mechatronics	1
		<b>4</b>
<b>Term 2</b>		
50620707	Welding Basics for Mechatronics	1
50620702	Mechatronics Principles	2
50620710	Power Transmission Systems for Mechatronics	1
		<b>4</b>
<b>Term 3</b>		
50620708	Fluid Power Systems for Mechatronics	2
50620705	Motors & Motor Control for Mechatronics	2
		<b>4</b>
<b>Term 4</b>		
50620711	Machining Concepts for Mechatronics	2
50620712	Introduction to PLC's	2
		<b>4</b>
<b>Term 5</b>		
50620714	HMI Technologies & PLC Applications for Mechatronics	2
50620715	Introduction to Robotic Systems for Mechatronics	2
		<b>4</b>
<b>Term 6</b>		
50620716	Introduction to Robotic Integration	3
50620709	Servos and Drives for Mechatronics	1
		<b>4</b>
		<b>TOTAL 24</b>

**AC ELECTRICITY FOR MECHATRONICS**...is designed to introduce the mechatronic technician apprentice to the basic concepts of alternating current. Emphasis is placed on circuit analysis and the problem-solving skills necessary for the maintenance of mechatronic systems and manufacturing equipment. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**DC ELECTRICITY FOR MECHATRONICS**...introduces the fundamental concepts and computations related to DC electricity. Emphasis is placed on circuit analysis and the problem-solving skills necessary for the maintenance of mechatronic systems and manufacturing equipment. Competencies related to metering and safe use of measuring devices are included. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**ELECTRICAL CODES FOR MECHATRONICS**...examines the National Electric Code and applies information to work practices involving mechatronic systems. Terminology needed to communicate and coordinate electrical work with other trades will be explored. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**FLUID POWER SYSTEMS FOR MECHATRONICS**...include inspecting, testing, servicing, and troubleshooting hydraulic, pneumatic, compressed air, and vacuum systems. Apprentices will review safety procedures for various common maintenance tasks. CONDITION: 506201 Mechatronics Technician Apprentice program reqs met

**HMI TECHNOLOGIES AND PLC APPS FOR MECHATRONICS**...examines human machine interface devices, software and technologies for mechatronic systems. Apprentices will work in a lab/shop/training center setting to create touchscreens, set-up networks, and configure systems. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**INTRO TO PROGRAMMABLE LOGIC CONTROLLERS**...is designed to teach the fundamentals of programmable logic controller and its programming software. The course will introduce terminology, concepts, schematic reading and basic programming. Technologies and PLC use in manufacturing and mechatronic systems will be emphasized. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**INTRO TO ROBOTIC SYSTEMS FOR MECHATRONICS**...introduces the apprentice to the robot teach pendant and methods of robot jogging. Learners will be taught to replace servo motors, re-master the robot, and back up robot software and programs. Maintenance, servicing and safety will be emphasized. Cable management systems will be examined. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**INTRODUCTION TO ROBOTIC INTEGRATION**...explores offsets, vision systems and system integration using robotic simulation and capstone project. The project will tie everything learned during their apprenticeship together – safety, machine integration, vision systems, CNC, machine applications for robotics, troubleshooting, and work documentation. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**MACHINING CONCEPTS FOR MECHATRONICS**...introduces cutting, drilling, lathes, and milling operations to apprentices in mechatronics. Course topics also include work holding devices, measuring tools and measurement, safety, machine guards, tooling, print reading, and speeds & feeds. Math skills will be applied to machining related work practices. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**MECHATRONIC PRINCIPLES**...will examine both introductory mechanical & electrical concepts as a foundation for future coursework and on-the-job learning. Troubleshooting principles associated with mechatronics will also be introduced. Apprentices will explore safety, rigging, measurement, mechanical principles, electrical principles, mechanisms, metallurgy, and troubleshooting. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**MOTOR AND MOTOR CONTROL FOR MECHATRONICS**...examines the fundamentals of electric motors and motor control. Apprentices will learn to recognize and draw basic symbols, use the language of motor control, and apply these in industry formats. Apprentices will also learn to draw and read ladder and wiring diagrams, and be introduced to the logic used in motor control. Learners will apply this logic to correctly interpret, install, service, and wire control circuits. Wiring of panels, machines, and systems will also be examined. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**POWER TRANSMISSION SYSTEMS FOR MECHATRONICS**...includes examining mechanical power transmission systems and components. Belts, chain drives, gears and gear drives, couplings, and clutches and brakes will be examined. Apprentices will develop skills inspecting, installing, and maintaining power transmission systems and troubleshooting failures. Apprentices will also learn about safety, documenting work performed, communicating the status of work, and working collaboratively. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**SERVOS AND DRIVES FOR MECHATRONICS**...introduces concepts, terminology, and safety associated with drives and servos used in industry and manufacturing. Course is designed to give the apprentice the knowledge required to program, service and maintain variable frequency drives and related equipment. Course learning outcomes include setting up and programming drives in a lab, shop or training center setting. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met

**TRADE MATH REVIEW FOR MECHATRONICS**...includes building skills working with fractions, decimals, formulas and ratios used by the trade. Measurement, tolerances and interpreting trade related information will help apply math concepts to industrial and manufacturing work processes. Basic algebra, geometry and trigonometry will be applied to job duties and tasks. Converting between US and metric units is also included. Provides a foundation for mechanical and electrical problem-solving involving math. CONDITION: 506201 Mechatronics Technician Apprentice program reqs met

**WELDING BASICS FOR MECHATRONICS**...compares common welding processes and develops apprentice skills related to welding, cutting, heating and using oxy-gas. Welding with arc and MIG will help develop competency working with metal. Additional course learning outcomes may include common cutting and joining techniques associated with applicable trade work processes. CONDITION: 506201 Mechatronics Technician Apprentice program requirements met