



BotsIQ Robotics Technician Pre-Apprenticeship

Tooling U-SME Classes



Personal Protective Equipment 111 - This class introduces the purpose and uses of personal protective equipment (PPE). As defined by the Occupational Safety and Health Administration (OSHA), PPE minimizes exposure to hazards and helps prevent injury. In order to select appropriate PPE, employers must first evaluate the workplace with a hazard assessment. PPE may be categorized by the area of the body it protects. PPE is available in several types, designs, and materials. Every employer is responsible for providing the appropriate PPE for workers who require it, and it is every employee's responsibility to properly wear and use PPE. OSHA does not often specify which types of PPE should be worn, but requires that employers train each employee in proper use and retrain when PPE changes or if PPE is used improperly. After taking this class, users should be able to describe OSHA regulations regarding personal protective equipment and how they impact day-to-day operations in the workplace.

Lockout/Tagout Procedures 141 - This class details the OSHA requirements and best practices for preventing accidental startup during maintenance and repair. It addresses electrical power and the many other forms of energy that a machine or device may use. All forms of energy must be successfully restrained or dissipated in order for safe maintenance. "Lockout/Tagout Procedures" describes using a lockout device that prevents unauthorized access of the energy-isolating mechanism. OSHA has strict requirements for lockout and tagout devices, which must be standardized, easily recognized warning signs. Users will learn OSHA's specific steps for all parts of the control of hazardous energy, from shutdown to startup, including defining authorized vs. affected employees.

Following proper lockout/tagout procedures is essential to preventing employee injuries and fatalities. All employees must be familiar with lockout/tagout in order to prevent the dangers of accidental machine startup.

Hand and Power Tool Safety 201 - This class provides guidelines for the safe use of common hand and power tools. Employees should never remove any safety guards from a tool's point of operation unless authorized. Tools must be regularly cleaned and maintained, and all blades must be kept sharp. The worksite must be kept organized, clean, and dry. All tool applications require PPE, including eye and other protection. Before working, employees must consult the owner's manual and be familiar with how the tool functions. Employees must also use the right tool for the job and follow the work practices that are specific to each type of tool.

When employees use proper safety guidelines when handling hand and power tools, their employers benefit from reduced accidents on the job and lowered costs caused by work-related injuries. Safe handling of tools also increases work quality. After taking this class, users should be able to describe the safe use and care of hand and power tools.

Safety for Soldering 115 - This class describes common safety hazards and precautions for soldering applications. Includes an Interactive Lab.

Intro to OSHA 100 - This class covers the goals and purposes of the Occupational Safety and Health Administration, including its standards, programs, and interactions with employers and employees.

Math Fundamentals 101 - The class "Math Fundamentals" covers basic arithmetic operations, including addition, subtraction, multiplication, and division. Additionally, it introduces the concept of negative numbers and integers. The class concludes with an overview of the order of operations and grouping symbols.

Math: Fractions and Decimals 111 - "Math: Fractions and Decimals" provides the methods used to perform basic mathematical operations using fractions, decimals, and percentages. The class covers addition, subtraction, multiplication, and division with fractions and decimals. It also discusses conversions between fractions, decimals, mixed numbers, and improper fractions.

Basic Measurement 101 - This class offers an overview of common gaging and variable inspection tools and methods. Variable inspection takes a specific measurement using common devices such as calipers and micrometers. The sensitivity of the instrument must be greater than the measurement being taken. Both calipers and micrometers are read by finding the alignments in lines on the devices. Gages, such as gage blocks, plug gages, ring gages, and thread gages, reveal whether a dimension is acceptable or unacceptable without a specific quantity. All inspection devices should be properly mastered and maintained to retain accuracy. One of the fundamental activities of any shop is the measurement of part features. Consistent measurement and inspection maintains standardization and ensures that out-of-tolerance parts do not reach customers. After taking this class, users should be able to describe the use and care of common inspection instruments and gages used in the production environment.

Units of Measurement 112 - The class "Units of Measurement" provides a thorough explanation of the English and Metric systems and how conversion between them occurs. After taking this class, users should be able to perform calculations involving common English units, metric units, and conversions between the two systems.

Overview of Machine Tools 121 - "Overview of Machine Tools" provides an overview of the basic machine tools used in metal cutting operations. The class describes the appearance, components, and uses of lathes, mills, drill presses, saws, and broaches. Lathes and mills are described in detail, including the various types of cutting operations performed and the different types of tools commonly used on both machines.

This class provides new users with the foundational information about machine tools and their uses that is necessary for users to gain familiarity with common metal cutting machines and knowledge of metal cutting theory and processes. A basic understanding of the types of machine tools used in metal cutting operations will prepare users for becoming machine operators.

Intro to Assembly 100 - This class describes the common assembly methods of mechanical fastening, adhesive bonding, and welding.

Basics of Tolerance 120 - This class explains the purpose of tolerances in manufacturing and describes how these tolerances are specified. Includes an Interactive Lab.

Tools for Threaded Fasteners 235 - This class provides a comprehensive overview of the different tools that are used to assemble threaded fasteners. There are many different types of tools used with threaded fasteners, but they all operate by applying torque. Manually powered hand tools include wrenches and screwdrivers. Power tools include battery-operated tools, electric tools, and pneumatic tools. Many power tools use clutches to control operation. These may be continuous-drive tools or discontinuous-drive tools.

Threaded fasteners are the most commonly used fasteners in assembly, and assemblers must be familiar with the different tools they require. After taking this class, users will have foundational knowledge of the different types of tools used with threaded fasteners and their advantages and disadvantages. Users will also be able to identify some of the factors that go into selecting a tool for a threaded fastener application.

Blueprint Reading 130 - This class identifies the information communicated on a blueprint with emphasis on interpreting the part drawing. Includes an Interactive Lab.

<p>Interpreting Blueprints 230 - This class provides an overview of common features found in prints and describes how to properly inspect them. Includes an Interactive Lab.</p>
<p>Soldering Applications 200 - This class describes essential skills for proper hand soldering and also explains how to inspect a finished joint and rework or repair a bad joint. Includes an Interactive Lab.</p>
<p>Electrical Print Reading 261 - "Electrical Print Reading" provides a fundamental overview of common electrical prints and symbols. The most common prints are pictorial, one-line, schematic, and wiring diagrams. Pictorial diagrams use illustrations to represent circuit components, but the other common types of diagrams use symbols. There are many different symbols, and some symbols have different variations. Diagrams include symbol keys to indicate what symbols represent, and sometimes symbols are labeled to make them easier to understand.</p> <p>This class introduces users to the types of prints and symbols that they are most likely to see, which will prepare them for reading and writing their own electrical prints. These are integral skills for working with electrical systems, since almost all electrical projects, from designing a circuit to troubleshooting one, involve electrical prints.</p>
<p>Series Circuit Calculations 301 - "Series Circuit Calculations" provides a comprehensive overview of the rules and formulas used to calculate and predict electrical quantities and capacity. Using a direct current (DC) series circuit as an example, it explains basic rules of electricity and how different electrical values relate.</p> <p>After taking this class, users should have a firm grasp of the methods used to determine various electrical values in a circuit. Understanding circuit rules and calculations is important for working with all aspects of electrical systems. These formulas and laws make it possible to predict electrical quantities, which is necessary when selecting components for a circuit. They are also helpful tools for designing and troubleshooting circuits.</p>
<p>Parallel Circuit Calculations 311 - "Parallel Circuit Calculations" provides a comprehensive overview of the rules and formulas used to calculate electrical quantities and capacity. Using a direct current parallel circuit as an example, it explains the basic rules for electrical variables and how they relate. In a parallel circuit, voltage is the same across each branch. Current in a parallel circuit adds up to the total current value. In any one branch of a parallel circuit, current and resistance are inversely proportional. The total resistance is always less than the smallest individual resistance.</p> <p>After taking this class, users should have a strong understanding of the methods used to determine electrical values in parallel and combination circuits. Understanding these rules and formulas is important for working with electrical systems because they make it possible to predict and calculate electrical quantities. This is especially important for parallel circuits because they are so commonly used.</p>
<p>Electrical Units 101 - "Electrical Units" provides a foundational overview of electricity, including fundamental measures and terminology used to discuss electricity. After taking this class, users should be familiar with the fundamentals of electricity and the vocabulary used to describe it.</p>
<p>Introduction to Circuits 201 - "Introduction to Circuits" provides a foundational overview of electrical circuitry. Understanding how circuits work is essential when working with electricity. This includes being familiar with circuit components, circuit diagrams, and the rules that govern circuits, which serves as the basis for understanding advanced electrical topics. Without the foundational information presented in this class, users would not be prepared to study more complex aspects of electrical systems.</p>
<p>Robot Sensors 150 - This class describes the various types of sensors that provide feedback data to robots. It also explains the categories of sensors and shows how sensors are used in industrial robotics.</p>
<p>Robot Components 120 - This class covers the functions and characteristics of the different components of an industrial robot.</p>
<p>Personal Effectiveness 190 - This class introduces the importance of effective communication and the various forms and mediums of communication in the workplace. The need for encouraging creativity, innovation, and the importance of knowledge and learning in the 21st century workplace is also described.</p>
<p>Troubleshooting 181 - This class provides a comprehensive overview of various methods and tools used to troubleshoot problems. Troubleshooting often involves finding the root cause of a problem and being able to distinguish deviations from problems and early warning signs from warning signs. Many tools are used to collect and interpret troubleshooting data, including check sheets, fishbone diagrams, and Pareto charts. The 5 Why technique, brainstorming, documentation, and troubleshooting teams are common methods of gathering troubleshooting data. Troubleshooting teams gather data in order to find possible solutions. Teams must test solutions to make sure they offer long-term results.</p> <p>Troubleshooting is an extremely important skill for all areas of industry. The information provided in this class prepares students to solve problems and understand how to work to prevent them in many different settings. Without this knowledge, students would not be able to solve problems effectively.</p>