



BotsIQ Introduction to Manufacturing Classes

Basic Measurement 101 (Basic Measurement 110/Linear Instrument Characteristics 115) - The class "Basic Measurement" 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.

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

Essentials of Communication 120 - This class describes key types of communication and common roadblocks to communication, as well as how to use effective communication as a tool to help build teamwork and manage conflict. Includes an Interactive Lab.

Intro to Additive Manufacturing 111 - This class introduces the basic concepts of additive manufacturing (AM), and discusses the history and development of AM, as well as the future. In addition, the basic process of AM is outlined and the technologies and classifications of AM are explored.

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

Intro to Fluid Systems 100 - This class provides an introduction to fluid power systems, including hydraulic and pneumatic components.

Intro to Mechanical Systems 100 - This class examines simple machines such as the lever and inclined plane and covers basic concepts of physical science, including mechanical advantage and friction.

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.

Intro to Robotics 110 - This class covers the classifications, characteristics, and functions of industrial robots as well as basic safety precautions for working with robots.

Intro to CNC Machines 201 - "Intro to CNC Machines" provides a comprehensive introduction to computer numerical control (CNC), which uses numerical data to control a machine. This class also describes PTP positioning and continuous path systems. After taking this class users should be able to describe common components of CNC machine tools and controls.

Introduction to Mechanical Properties 111 (Intro to Materials 100/Mechanical Properties of Metals 120) - "Intro to Mechanical Properties" provides a thorough introduction to key mechanical properties, such as tensile strength, hardness, ductility, and impact resistance. This class discusses how shear, compression, and tensile stress impact a material's properties, how force is shown on a stress-strain graph, and common methods manufacturers use to test a material's strength.

Introduction to Metals 121 - "Intro to Metals" provides an overview of popular ferrous and nonferrous metals and their properties. This course introduces users to the three types of metal crystal structures, how grains develop in metal, the purpose of heat treating, and how these aspects impact a material's characteristics. After completing Intro to Metals, users will know how various metals function in different environments, making them better equipped to select materials and tooling.

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.

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.

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.

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.

Lean Manufacturing Overview 101 - "Lean Manufacturing Overview" provides an introduction to the principles and terminology of lean strategies, including a discussion of the seven forms of waste, the definition of value-added, the difference between push and pull systems, and the importance of continuous improvement.

Intro to Abrasives 100 - This class defines abrasive processes and explains the major groups of abrasive tools.

Introduction to Physical Properties 101 - Intro to Physical Properties provides an overview of manufacturing materials and their physical properties, including thermal, electrical, and magnetic properties. This class also introduces users to volumetric characteristics, such as mass, weight, and density. After taking this course, users will be able to identify and describe key physical properties and their value in a manufacturing setting.

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

Basics of Manufacturing Costs 140 - This class describes the basic costs associated with manufacturing and how these costs are typically controlled.

Introduction to Welding 141 - "Introduction to Welding" provides the foundational understanding of welding and welding processes on top of which process-specific knowledge and a more comprehensive understanding of welding in general is built. The class introduces the different welding processes as well as their general attributes and applications. In addition, it reviews joint and weld types, covers measurements which pertain to welding, discusses welding procedure specifications, and, finally, gives the user information on emerging welding practices and their effect on the practice of welding and the economy.

Quality Overview 100 - This class identifies how each department and function of a company plays a role in producing quality products for the customer.

Battery Selection 321 - "Battery Selection" discusses the factors by which batteries are rated and other considerations that go into selecting an appropriate battery. It also describes many of the most common types of batteries. Choosing appropriate batteries for different applications ensures that devices will work optimally and prevents unnecessary costs.