090 – Basic Manufacturing Skills

Onsite – 3 Days, 3 – 6-hour sessions - Optimum class size, 12

Training Description:

Basic Manufacturing Skills provides the foundational skills for more advanced technical skills training. The curriculum includes Shop Math, Blueprint Reading, and Metrology. The course covers basic math concepts and terms, arithmetic operations, line drawings, special part features and configurations, hands on use of tools and measurement of product parts.

Training Objective:

The objective of each module is to upgrade the skills of the students to help them become more productive in today's ever-changing factory. Basic Shop Math is designed for to improve the basic math skills that are required in areas such as reading and interpreting blueprints or performing math calculations for statistical process control. This basic print reading program explains the importance of engineering drawings in manufacturing and thoroughly describes the generation and duplication of such drawings. It discusses the basic elements of a blueprint and introduces the concepts which students must master to successfully interpret engineering drawings. The Metrology module is designed to attain a basic level of competency in the use of precision measurement tools that will allow employees to monitor and validate the production outputs related to the precision parts making process.

Skill Attainment:

Shop Math: Students will be able to understand basic math concepts and terms as well as recognize symbols that represent them. They will be able to solve basic problems with and without the use of a calculator. Students will be able to compute basic mathematical equations required to perform related tasks on the shop floor.

Blueprint Reading: Students learn how to read and interpret technical drawings (blueprints). They gain a fundamental understanding of the critical role the technical drawing plays with respect to work process, quality control and a product's critical features.

Metrology: Students gain a solid foundation of knowledge and skill in performing measurements and calculations. The student learns to use precision measurement tools and gains proficiency selecting the proper tools for inspecting parts and in preparing quality control inspection reports.
These skills are transferable within the company, industry and are highly desirable by any manufacturer.

BASIC MANUFACTURING SKILLS

Basic Shop Math Skills

Method of Instruction: Instructor & Projected Presentation

Basic Shop Math is designed for those who want to learn the basic math skills that are required in areas such as reading and interpreting blueprints or performing math calculations.

Program Content

Lesson 1:

- Basic Math Concepts and Terms
- Identifying place values of numbers
- Identifying math terms and symbols:
- Equals/ does not equal
- Plus/minus
- Plus or minus
- Multiply/divide
- Square root
- Greater than/greater than or equal to
- Less than/less than or equal to
- Approximately equal to
- Infinity/proportional to/percent

Lesson 2:

- Basic Arithmetic Operations
- Solving subtraction of whole numbers
- Solving multiplication of whole numbers
- Solving division of whole numbers
- Evaluating the order of basic arithmetic operations

Lesson 3:

- Calculator Operations
- Identifying the function of each calculator key
- Solving addition problems
- Solving subtraction problems
- Solving multiplication problems
- Solving division problems
- Solving problems using order of operations
- Solving percentage problems
- Solving square root problems

Lesson 4:

- Averages
- Defining average
- Solving averaging problems

Lesson 5:

- Fractions and Decimals
- Solving problems requiring the addition and subtraction of fractions
- Reducing fractions to lowest terms
- Converting fractions to decimals and decimals to fractions
- Calculating percentages

Basic Blueprint Reading
Method: Instructor & DVD

Module 1: Line Drawings	**Module 2: Special Part Features and Configurations**
• Types of Projections • Types of Lines • Title Block Information • Basic Part Characteristics • Features and Dimensions • Dimensions of Size and Location • Defining and Interpreting Tolerances • Fractional and Decimal Dimensions • Diameters and Angles • Scale Drawings and Drawings in Section	• Undercutting and Grooving • Rounds and Fillets • Chamfers and Tapers • Beveled Surfaces • Knurls • Slots and Keyways • Bosses and Pads • Finishing Marks • Holes ○ Countersunk, Counterbored and Spotfaced • Threads and Thread Terminology • Straight and Tapered Threads

Mechanical Measurement and Quality Control
Method: Instructor & Interactive Computer Interface

- Scaled Measurement Tools
- Vernier, Dial Calipers
- Micrometers
- Height Gages & Dial Indicators
- Fixed Gages
- Outside Calipers
- Inside Calipers
- Nominal Dimensions & Tolerance
- Parts Inspection