

Student's Name/Initials

Date

Teacher's Initials

Date

INTRODUCTION TO MANUFACTURING TECHNOLOGY Activity/Course Code 6045

DIRECTIONS:

Evaluate the student using the applicable rating scales below and check the appropriate box to indicate the degree of competency. The ratings 3, 2, 1, and N are not intended to represent the traditional school grading system of A, B, C, and D. The description associated with each of the ratings focuses on the level of student performance or cognition for each of the competencies listed below.

If student takes Introduction to Construction and scores 70% on all assessments (A-H), he or she does not have to repeat these modules in Air Conditioning and Refrigeration Technology, Building Construction, Cabinetmaking, Carpentry, Electricity, Masonry, Mechatronics Integrated Technologies, Plumbing, or Welding.

PERFORMANCE RATING

- 3 - Skilled--can perform task independently with no supervision
- 2 - Moderately skilled--can perform task completely with limited supervision
- 1 - Limitedly skilled--requires instruction and close supervision
- N - No exposure--has no experience or knowledge of this task

COGNITIVE RATING

- 3 - Knowledgeable--can apply the concept to solve problems
- 2 - Moderately knowledgeable--understands the concept
- 1 - Limited knowledge--requires additional instruction
- N - No exposure--has not received instruction in this area

BASIC TECHNICAL KNOWLEDGE AND SKILLS

SAFETY

UNIT A: CAREERS IN MANUFACTURING

3 2 1 N

- 1. Describe job opportunities in the area of manufacturing.
- 2. Describe careers in other areas that support the manufacturing process.
- 3. Identify manufacturing industries in the local area and job opportunities in these industries.
- 4. Complete a job application form for a manufacturing position.

UNIT B: SAFE AND PRODUCTIVE WORKPLACE

3 2 1 N

- 1. Discuss ways in which manufacturing affects the national economy and standard of living.

3 2 1 N

- 2. Describe knowledge of ways in which the global economy affects manufacturers.
- 3. Discuss common safety practices and systems.
- 4. Discuss responsibilities of a frontline production worker in a high-performance, safety-conscious work organization.

UNIT C: SAFETY PROCEDURES

3 2 1 N

- 1. Locate and use Material Safety Data Sheets (MSDS).
- 2. Demonstrate knowledge of first aid or first response procedures.
- 3. Demonstrate knowledge of material handling techniques required to move materials safely.

3 2 1 N

- 4. Discuss how to be proactive in responding to a safety concern and how to document occurrences.
- 5. Discuss emergency exits.
- 6. Discuss various emergency alarms and procedures.
- 7. Use clean-up procedures for spills.
- 8. Describe Lock Out/Tag Out requirements.
- 9. Inspect work area and report possible safety risks.
- 10. Demonstrate knowledge of machinery and equipment safety functions to determine whether or not all safeguards are operational.
- 11. Describe safety procedures to follow in cases of smoke/chemical inhalation.
- 12. Describe procedures for handling hazardous material.

3 2 1 N

- ___ ___ ___ 13. Develop safety checklists.
- ___ ___ ___ 14. Demonstrate knowledge of equipment shutdown procedures.

UNIT D: PERSONAL SAFETY PRACTICES

3 2 1 N

- ___ ___ ___ 1. Identify and report unsafe conditions.
- ___ ___ ___ 2. Select and use personal protective equipment.
- ___ ___ ___ 3. Demonstrate knowledge of ergonomic impact of work techniques.
- ___ ___ ___ 4. Demonstrate knowledge of proper and improper techniques for lifting loads.
- ___ ___ ___ 5. Demonstrate knowledge of safety requirements for platforms, man lifts, and ladders.
- ___ ___ ___ 6. Demonstrate knowledge of safety requirements for material handling equipment such as forklifts, cranes, rigging, and pry trucks.
- ___ ___ ___ 7. Demonstrate knowledge of safety requirements for manual, electrical-powered, and pneumatic tools.
- ___ ___ ___ 8. Demonstrate knowledge of safety requirements for operation of automated machines/automated processes.

UNIT E: SAFETY POLICIES AND REGULATIONS

3 2 1 N

- ___ ___ ___ 1. Demonstrate knowledge of Occupational Safety and Health Administration (OSHA) and other health and safety requirements as applied to the workplace.
- ___ ___ ___ 2. Demonstrate knowledge of government policies, procedures, and regulations governing the safe use of equipment.
- ___ ___ ___ 3. Demonstrate knowledge of Hazardous Materials (HAZMAT) procedures information.

3 2 1 N

- ___ ___ ___ 4. Demonstrate knowledge of Material Safety Data Sheets (MSDS).
- ___ ___ ___ 5. Demonstrate knowledge of applicable safety standards.
- ___ ___ ___ 6. Demonstrate knowledge of which tools and equipment require safety certification.
- ___ ___ ___ 7. Demonstrate knowledge of what the law requires companies to post or publish in order to keep employees abreast of OSHA and other government regulations.
- ___ ___ ___ 8. Demonstrate knowledge of Environmental Protection Agency (EPA)-required documentation for (a) disposal of hazardous waste generated during maintenance or (b) transportation of contaminated items.
- ___ ___ ___ 9. Demonstrate knowledge of accident documentation procedures.

UNIT F: SAFETY TRAINING

3 2 1 N

- ___ ___ ___ Demonstrate knowledge of certifications needed for regulatory compliance (e.g., Cardio Pulmonary Resuscitation [CPR], fire extinguisher, blood-borne pathogens).

UNIT G: COMMUNICATION SKILLS THAT ENHANCE SAFETY

3 2 1 N

- ___ ___ ___ 1. Demonstrate knowledge of ways to improve reading, listening, and writing skills.
- ___ ___ ___ 2. Demonstrate knowledge of techniques for making effective presentations to internal and external customers, including safety orientations.
- ___ ___ ___ 3. Demonstrate skill in using different forms of communication, such as e-mail, fax, and phone.

3 2 1 N

- ___ ___ ___ 4. Demonstrate skill in providing effective feedback and in making decisions.
- ___ ___ ___ 5. Demonstrate skill in communicating customer needs effectively to others including shift-to-shift, coworkers, and managers, including needs that impact safety.

UNIT H: TEAMWORK SKILLS THAT ENHANCE SAFETY

3 2 1 N

- ___ ___ ___ 1. Demonstrate knowledge of the characteristics of a high-performance team.
- ___ ___ ___ 2. Demonstrate knowledge of roles and responsibilities of production team members.
- ___ ___ ___ 3. Demonstrate skill in using teamwork to deal with customer requests..
- ___ ___ ___ 4. Demonstrate knowledge of ways to align team goals to customer and business production needs.
- ___ ___ ___ 5. Demonstrate skill in ensuring that team goals are specific, documented, measurable, and achievable.
- ___ ___ ___ 6. Demonstrate skill in communicating production information to team members.
- ___ ___ ___ 7. Demonstrate skill in using team problem solving and conflict resolution processes.

BASIC TECHNICAL KNOWLEDGE AND SKILLS QUALITY PRACTICES AND MEASUREMENT

UNIT I: OVERALL QUALITY PROCESS

3 2 1 N

- ___ ___ ___ 1. Demonstrate knowledge of quality standards and how they apply to products in order to make effective decisions about quality problems.
- ___ ___ ___ 2. Demonstrate knowledge of quality procedures and product specifications to identify nonconformance.

3 2 1 N

- ___ ___ ___ ___ 3. Demonstrate skill in identifying product defects and defect patterns.
- ___ ___ ___ ___ 4. Demonstrate knowledge of how to check and test good products and nonconforming products.
- ___ ___ ___ ___ 5. Demonstrate knowledge of quality terminology.
- ___ ___ ___ ___ 6. Demonstrate knowledge of quality assurance procedures.

UNIT J: QUALITY SYSTEMS AND INSPECTION TOOLS

3 2 1 N

- ___ ___ ___ ___ 1. Demonstrate knowledge of quality systems such as Statistical Process Control (SPC), Six Sigma, Total Quality Management (TQM), Lean Management, "Plan-Do-Check-Act," and International Standards Organization standards, especially ISO 9001:2000 for manufacturers.
- ___ ___ ___ ___ 2. Demonstrate skill in determining accuracy and precision when using measuring equipment.
- ___ ___ ___ ___ 3. Demonstrate knowledge of how to use inspection tools, equipment, and procedures.
- ___ ___ ___ ___ 4. Demonstrate knowledge of inspection equipment calibration standards and requirements.
- ___ ___ ___ ___ 5. Demonstrate skill in verifying calibration of inspection equipment.
- ___ ___ ___ ___ 6. Demonstrate knowledge of appropriate automated inspection system.
- ___ ___ ___ ___ 7. Demonstrate skill in using hand-held inspection devices to examine materials.
- ___ ___ ___ ___ 8. Demonstrating skill in maintaining and storing inspection tools.

UNIT K: QUALITY DOCUMENTATION

3 2 1 N

- ___ ___ ___ ___ 1. Complete proper forms to document problems and corrective action.
- ___ ___ ___ ___ 2. Use computer systems to document and track substandard and scrapped parts, materials, and assemblies as required by quality processes.
- ___ ___ ___ ___ 3. Demonstrate knowledge of documentation process and requirements to ensure verifiable evidence of product quality.
- ___ ___ ___ ___ 4. Demonstrate knowledge of quality system protocol for performing an audit.
- ___ ___ ___ ___ 5. Demonstrate knowledge of the procedure for reviewing quality problems with operators to provide feedback.
- ___ ___ ___ ___ 6. Demonstrate knowledge of correct and incorrect approval procedures to document inspection results.
- ___ ___ ___ ___ 7. Demonstrate knowledge of procedures for recording and storing product history and maintaining records.
- ___ ___ ___ ___ 8. Demonstrate knowledge of how to use route sheets and statistical method charts to document process.
- ___ ___ ___ ___ 9. Demonstrate knowledge of follow-up and reporting documentation procedures to ensure proper communications.

UNIT L: BLUEPRINT READING FUNDAMENTALS

3 2 1 N

- ___ ___ ___ ___ 1. Visualize objects from a multi-view drawing.
- ___ ___ ___ ___ 2. Identify product features from a multi-view drawing.
- ___ ___ ___ ___ 3. Identify dimensions and tolerances of an object from a multi-view drawing.

3 2 1 N

- ___ ___ ___ ___ 4. Interpret geometric dimensioning and assembly tolerances on a drawing.
- ___ ___ ___ ___ 5. Interpret title blocks.
- ___ ___ ___ ___ 6. Demonstrate skill in interpreting assembly drawings.

UNIT M: BASIC MEASUREMENT

3 2 1 N

- ___ ___ ___ ___ 1. Convert measurements in U.S. measurement and standard international metrics systems.
- ___ ___ ___ ___ 2. Demonstrate measuring parts using a machinist's rule.
- ___ ___ ___ ___ 3. Demonstrate measuring parts using a tape measure.
- ___ ___ ___ ___ 4. Demonstrate measuring parts using dial and digital calipers.
- ___ ___ ___ ___ 5. Demonstrate measuring parts using a micrometer.
- ___ ___ ___ ___ 6. Demonstrate measuring parts using a dial indicator.
- ___ ___ ___ ___ 7. Demonstrate collecting measurement data from a digital gauge using a computer.