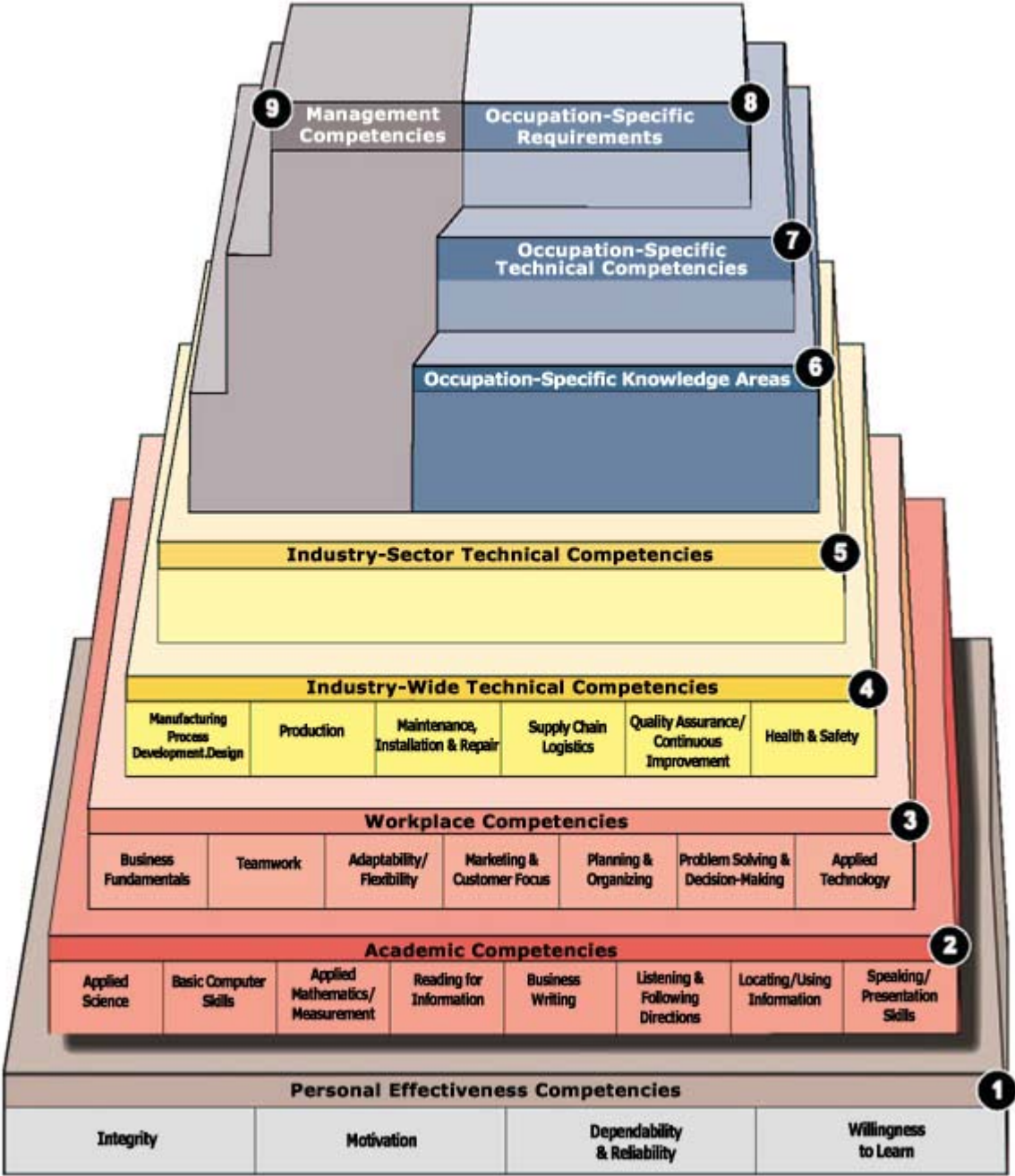




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# Framework of Competencies by the Advanced Manufacturing Industry



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## Tier 1: Personal Effectiveness

Personal Effectiveness Competencies			
Integrity	Motivation	Dependability & Reliability	Willingness to Learn

1

Personal Effectiveness
<b>1. Integrity: Displaying accepted social and work behaviors.</b>
<ul style="list-style-type: none"> <li>▪ Use good manners</li> <li>▪ Maintain confidentiality as appropriate about matters encountered in the workplace</li> <li>▪ Treat supervisors and co-workers with respect</li> <li>▪ Perform quality work</li> <li>▪ Practice honesty with regard to company time and property</li> </ul>
<b>2. Motivation: Demonstrating a willingness to work.</b>
<ul style="list-style-type: none"> <li>▪ Take responsibility for completing one's own work assignment</li> <li>▪ Show initiative in carrying out work assignments</li> <li>▪ Take initiative in seeking opportunities to learn new skills and tasks</li> </ul>
<b>3. Dependability/Reliability: Displaying responsible behaviors at work.</b>
<ul style="list-style-type: none"> <li>▪ Avoid absenteeism</li> <li>▪ Demonstrate promptness</li> <li>▪ Maintain appropriate grooming and hygiene</li> <li>▪ Do not attend to personal business on the job</li> <li>▪ Manage stressful situations effectively</li> </ul>
<b>4. Willingness to Learn: Understanding the importance of learning new information for both current and future problem-solving and decision-making.</b>
<ul style="list-style-type: none"> <li>▪ Accept help from supervisors and co-workers</li> <li>▪ Learn new/additional skills related to the job</li> <li>▪ Learn about the products or services of the organization</li> <li>▪ Contribute to solving problems on the job through suggestions, recommendations and communication</li> </ul>

## Tier 2: Foundation Academic Competencies

Academic Competencies							
Applied Science	Basic Computer Skills	Applied Mathematics/ Measurement	Reading for Information	Business Writing	Listening & Following Directions	Locating/Using Information	Speaking/ Presentation Skills

2

Academic Competencies
<b>1. Applied Science: Using scientific rules and methods to solve problems.</b>
<p><b>Scientific Principles</b></p> <ul style="list-style-type: none"> <li>▪ Understand the scientific principles involved in industry-specific production processes</li> <li>▪ Apply basic science principles to work-related problems &amp; production processes               <ul style="list-style-type: none"> <li>▪ Physical</li> <li>▪ Chemical</li> <li>▪ Biological</li> <li>▪ Environmental</li> </ul> </li> </ul>
<b>2. Basic Computer Skills: Using a personal computer and related applications to convey and retrieve information.</b>
<b>Navigation and File Management</b>

- Use scroll bars, a mouse, and dialog boxes to work within the computer's operating system.
- Access and switch between applications and files of interest

#### **Internet and E-mail**

- Navigate the Internet to find information
- Open and configure standard browsers
- Use searches, hypertext references, and transfer protocols;
- Send and retrieve electronic mail (e-mail).

#### **Word Processing**

- Use a computer application to type text, insert pictures
- Format, edit, print text
- Save, and retrieve word processing documents

#### **Spreadsheets**

- Use a computer application to enter, manipulate, and format text and numerical data
- Insert, delete, and manipulate cells, rows, and columns
- Create and save worksheets, charts, and graphs.

#### **Presentations**

- Use a computer application to create, manipulate, edit, and show virtual slide presentations.

#### **Databases**

- Use a computer application to manage large amounts of information
- Create and edit simple databases
- Input data,
- Retrieve detailed records
- Creating reports to communicate the information

#### **Graphics**

- Work with pictures in graphics programs or other applications
- Creating simple graphics
- Manipulating the appearance
- Inserting graphics into other files/programs.

### **3. Applied Mathematics/Measurement: Using mathematics to solve problems.**

#### **Computation**

- Add, subtract, multiply, and divide with whole numbers, fractions, decimals, and percents
- Calculate averages, ratios, proportions and rates; convert decimals to fractions
- Convert fractions to percents.

#### **Basic algebraic functions**

#### **Applied geometric principles**

- Analyze characteristics and properties of two- and three-dimensional geometric shapes
- Use geometric terms, such as spatial coordinates, with concrete objects and drawings.
- Use visualization, spatial reasoning, and geometric modeling to solve problems.

#### **Measurement and estimation**

- Take measurements of time, temperature, distances, length, width, height, perimeter, area, volume, weight, velocity, and speed
- Use and report measurements correctly
- Convert from one measurement to another (e.g., from English to metric).
- Estimate sizes, distances, and quantities; or determine time, costs, resources, or materials needed to perform a work activity

#### **Application**

- Perform basic math computations accurately
- Translate practical problems into useful mathematical expressions

<ul style="list-style-type: none"> <li>Use appropriate mathematical formulas and techniques.</li> </ul>
<p><b>4. <u>Reading for Information:</u> Understanding written sentences and paragraphs in work related documents.</b></p>
<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>Read and understand work-related instructions and policies, memos, bulletins, notices, letters, policy manuals, and governmental regulations</li> <li>Read documents ranging from simple &amp; straightforward to more complex &amp; detailed</li> <li>Read and interpret technical manuals and equipment specifications</li> </ul>
<p><b>5. <u>Business Writing:</u> Using standard business English, defined as writing that is direct, courteous, grammatically correct, and not overly casual. The main requirement of workplace writing is clarity.</b></p>
<p><b>Organization and development</b></p> <ul style="list-style-type: none"> <li>Create documents such as letters, directions, manuals, reports, graphs, and flow charts</li> <li>Communicate thoughts, ideas, information, messages and other written information, which may contain technical material, in a logical, organized, coherent, and persuasive manner</li> <li>Ideas are well developed with supporting information and examples</li> </ul> <p><b>Mechanics</b></p> <ul style="list-style-type: none"> <li>Use standard syntax and sentence structure</li> <li>Use correct spelling, punctuation, and capitalization; uses appropriate grammar (e.g., correct tense, subject-verb agreement, no missing words)</li> <li>Tone – Write in a manner appropriate for business; uses language appropriate for the target audience; uses appropriate tone and word choice (e.g., writing is professional and courteous)</li> </ul>
<p><b>6. <u>Listening to and Following Directions:</u> Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.</b></p>
<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>Receive, attend to, interpret, understand, and respond to verbal messages and other cues</li> <li>Pick out important information in verbal messages</li> <li>Understand complex instructions</li> <li>Appreciate feelings and concern of verbal messages.</li> </ul> <p><b>Following Directions</b></p> <ul style="list-style-type: none"> <li>Act upon the instruction to complete an assignment.</li> </ul>
<p><b>7. <u>Locating and Using Information:</u> Knowing how to find information and identifying essential information (information gathering).</b></p>
<p><b>Organize relevant information</b></p> <ul style="list-style-type: none"> <li>Review information obtained for relevance and completeness</li> <li>Recognizes important gaps in existing information</li> <li>Take steps to eliminate those gaps</li> <li>Organize/reorganize information as appropriate to get a better understanding of the problem.</li> </ul>
<p><b>8. <u>Speaking/Presentation:</u> Speaking so others can understand. Communicate in spoken English well enough to make oneself understood by supervisors and co-workers.</b></p>
<p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>Speak clearly</li> <li>Use correct grammar</li> <li>Effectively use eye-contact and non-verbal expression</li> <li>Present ideas in a persuasive manner</li> </ul> <p><b>Presentation</b></p> <ul style="list-style-type: none"> <li>Express information to individuals or groups taking into account the audience and the nature of the information</li> </ul>

- Track audience responses and react appropriately

### Tier 3: Workplace Competencies



### Workplace Competencies

**1. Business Fundamentals:** Determining how an economy functions as a whole. Money is allocated and spent to get the work done, and accounting for these expenditures.

#### Economic/Business/Financial Principles

- Economic Terminology
- Supply/Demand
- Characteristics of markets
- Cost and pricing of products
- Profit and loss
- Fundamentals of Accounting

#### Economic System as a Framework for Decision-making

- Understand how one's performance can impact the success of the organization.
- Consider the relative costs and benefits of potential actions to choose the most appropriate one.

**Business Ethics**—Act in the best interests of the company, your co-workers, your community, and the environment.

- Legal/financial
  - Compliance with the spirit of applicable laws as well as the letter.
  - Proper use of company property, minimizing loss and waste; report loss, waste or theft of company property to appropriate personnel.
  - Maintain privacy and confidentiality of company information, as well as that of customers and co-workers
- Environmental/health/safety
  - Maintain a healthful and safe environment and report any violations/discrepancies
  - Ensure proper handling and disposal of toxic or hazardous materials
- Social
  - Treat co-workers fairly and with respect
  - Emphasize quality, customer satisfaction and fair pricing.
  - Deal with customers in good faith, no bribes, kickbacks, or excessive hospitality.

#### Marketing

- Demonstrate an understanding of market trends, company's position in the market place, defined market segments
- Understand position of product/service in relation to market demand
- Uphold the company and product brand through building and maintaining customer relations
- Integrate internal and external customer demands and needs into manufacturing product and process development

**2. Teamwork: Developed capacities used to work with people to achieve goals. Includes social perceptiveness, coordination, persuasion, negotiation, instructing, and service orientation.**

**Work with Others**

- Work as part of a team to achieve mutual goals
- Develop and maintain good working relationships with supervisors and co-workers
- Choose behaviors and/or actions that best support the team and lead toward the accomplishment of work tasks
- Recognize a team's goals and identify ways to accomplish those goals in increasingly complex workplace situations

**Influence/Negotiate**

- Work through conflict constructively
- Persuasively present thoughts and ideas
- Respect the views of others
- Build toward consensus
- Influence, motivate, and persuade others in order to achieve company and client objectives

**3. Adaptability/Flexibility: Being open to change (positive or negative) and to considerable variety in the workplace.**

**Entertain new ideas**

- Is open to considering new ways of doing things
- Actively seek out and carefully considers the merits of new approaches to work
- Willingly embrace new approaches when appropriate and discards approaches that are no longer working.

**Deal with ambiguity**

- Take effective action when necessary without having to have all the necessary facts in hand
- Change gears in response to unpredictable or unexpected events
- Effectively change plans, goals, actions or priorities to deal with changing situations.

**Work with people from diverse backgrounds**

- Is flexible and open-minded when dealing with a wide range of people
- Listen to and consider others' viewpoints
- Alter opinion when it is appropriate to do so
- Work well and develop effective relationships with highly diverse personalities.

**4. Marketing and Customer Focus: Actively looking for ways to identify market demands and meet the customer or client need.**

**Understand customer needs**

- Identify internal and external customers
- Demonstrate a desire to understand customer needs
- Ask questions as appropriate
- Demonstrate awareness of client goals.

**Provide personalized service**

- Provide prompt and efficient responses to meet the requirements, requests, and concerns of customers
- Provide thorough, accurate information to answer customers' questions and to meet commitment times or performance guarantees;
- Actively look for ways to help customers by identifying and proposing appropriate solutions and/or services
- Establish boundaries as appropriate for unreasonable customer demands.

**Act professionally**

- Is pleasant, courteous and professional when dealing with internal or external customers
- Develop constructive and cooperative working relationships with customers

- Display a good-natured, cooperative attitude; is calm and empathetic when dealing with hostile customers.
- Uphold the company and product brand in interactions with others

**Keep customers informed**

- Follow up with customers during projects and following project completion
- Keep clients up to date about decisions that affect them
- Seek the comments, criticisms and involvement of customers
- Adjust services based on customer feedback.
- Address customer comments, questions, concerns and objections with direct accurate and timely responses

**5. Planning/Organizing: Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions. For instance, finding ways to structure or classify multiple pieces of information.**

**Plan**

- Approach work in a methodical manner
- Plan and schedule tasks so that work is completed on time
- Keep track of details to ensure work is performed accurately and completely

**Prioritize**

- Prioritize various competing tasks
- Perform tasks quickly and efficiently according to their urgency
- Find new ways of organizing work area or planning work to accomplish work more efficiently.

**Allocate Resources**

- Estimate resources needed for project completion
- Allocate time and resources effectively
- Coordinate efforts with all affected parties
- Keep all parties informed of progress and all relevant changes to project timelines.

**Anticipate Obstacles**

- Anticipate obstacles to project completion
- Develop contingency plans to address them
- Take necessary corrective action when projects go off-track.

**6. Problem Solving/Decision-making: Considering the relative costs and benefits of potential actions to choose the most appropriate one.**

**Identify the problem**

- Recognize the existence of a problem
- Define the problem
- Identify potential causes of the problem by analyzing its component parts
- Use all available reference systems to locate and obtain information relevant to the problem
- Recall previously learned information that is relevant to the problem.

**Communicate the problem to appropriate personnel**

**Use team-building skills to analyze the problem**

- Identify potential causes of the problem by analyzing its component parts
- Use all available reference systems to locate and obtain information relevant to the problem
- Recall previously learned information that is relevant to the problem

**Use team-building skills to generate possible solutions**

- Generate a number of different approaches to problems
- Evaluate the relative merits of the various solutions

**Choose a solution**

- Decisively choose the best solution after contemplating available approaches to the problem
- Make difficult decisions even in highly ambiguous or ill-defined situations;
- Quickly choose an effective solution without assistance when appropriate.



### Implement the solution

- Commit to a solution in a timely manner
- Develop a realistic approach for implementing the chosen solution
- Observe and evaluate the outcomes of implementing the solution to assess the need for alternative approaches and to identify lessons learned.
- Solve problems of a technological nature using logic & reasoning

## 7. **Applied Technology:** Developed capacities used to design, set-up, operate, and correct malfunctions involving application of machines or technological systems.

### Use Technology

- Use appropriate computer-based technology (see basic computer skills).
- Use a telephone, pager, radio, or other device to convey and receive information.
- Use appropriate methods and instructions to insure equipment is used safely and without damage to the equipment.

### Equipment Selection and Troubleshooting

- Determine and select the appropriate tools and equipment needed to do a job.
- Determine when and what kind of maintenance is needed.
- Determine sources of operating error of equipment and appropriate responses.

## Tier 4—Industry-wide Technical Competencies - Entry-Level

Industry-Wide Technical Competencies					
Manufacturing Process Development/Design	Production	Maintenance, Installation & Repair	Supply Chain Logistics	Quality Assurance/ Continuous Improvement	Health & Safety

4

## 1. **MANUFACTURING PROCESS DESIGN/DEVELOPMENT:** Research, design, implement, and continuously improve the manufacturing process to ensure product meets customer needs.

### Entry-Level Critical Work Functions:

- Support manufacturing process design and development.
- Communicate about and respond to requirements of internal and external customers.

### Entry-Level Technical Content Areas:

#### Fundamentals of Research & Development

- Awareness of basic Product R&D
- Awareness of basic Process R&D

#### Technical Drawings and Schematics

- Print Reading
- Interpretation of Drawings
- Interpretation of Schematics
- Geometric Dimensions and Tolerances

#### CAD Drawing Fundamentals

- Creation of Computer Aided Design (CAD) Drawings
- Interpretation of CAD Drawings
- Updating and Editing CAD Drawings
- CAD/CAM/CAE Applications

#### Troubleshooting Processes

- Knowledge of Statistical Process Control
- Problem Solving Skills

#### Process Assessment

- Procedure Analysis and Verification
- Documentation Fault Finding Skills

**2. PRODUCTION:** Set up, operate, monitor, control and improve manufacturing processes and schedules to meet customer requirements.

**Entry-Level Critical Work Functions:**

- **Manage raw materials/consumables**
- **Operate and control production/lab equipment.**
- **Perform manufacturing process applications and operations**

**Entry-Level Technical Content Areas:**

**Production Basics**

- Types of Production
- Lean Manufacturing/Continuous Improvement

**Production Materials**

- Sources
- Types of Materials

**Precision Measurement**

**Manual Tool & Equipment Operations**

**Basic Automated Systems & Control Operations**

- Automated Equipment
- Automated Systems
- Computer Control
- Robotics
- Process Control
- Analytical Testing

**Basic Manufacturing Process Applications & Operations**

- Assembly Processes
- Fabrication Processes
- Electrical/Electronics Manufacturing Processes
- Continuous Flow/Line Balancing Processes
- Finishing Processes
- Clean Room Processes
- Experiment Design/Implementation Processes
- Implementation of Approved Protocols

**3. MAINTENANCE, INSTALLATION AND REPAIR:** Maintain and optimize manufacturing equipment and systems.

**Entry-Level Critical Work Functions:**

- **Identify, diagnose and/or repair equipment problems.**
- **Communicate with others to ensure maintenance and repairs meet operational needs.**
- **Maintain hands-on knowledge of equipment operations.**
- **Maintain equipment, tools and workstations.**

**Entry-Level Technical Content Areas:**

**General Skills**

- Use of Hand Tools
- Schematic Drawings and Control Documents
- Calibrated Measuring Instruments
- Knowledge of Basic AC/DC Electrical Systems
- Installation of Parts for Industrial Equipment

**Basic Disassembly/Assembly Skills**

**Basic Maintenance and Troubleshooting Skills**

- Mechanical Systems
- Electrical Systems
- Electronic Systems
- Hydraulic/Pneumatic Systems
- High Vacuum Systems
- Laser Systems
- Computer Systems

**4. HEALTH AND SAFETY: Maintain a safe, healthy work environment.**

**Entry-Level Critical Work Functions:**

- Follow established personal safety practices.
- Ensure that equipment is being used safely.
- Comply with local, federal and company health, safety and environmental regulations.
- Identify unsafe conditions and take corrective actions.

**Entry-Level Technical Content Areas:**

**Personal Safety**

- Use of Personal Protective Equipment and Clothing
- Safety Procedures for Clean and Safe Working Environment
- Following Established Safety Practices

**Safety Procedures**

- First Aid or First Response Procedures
- Use of Safety Equipment
- Safe, Prescribed Operation of Equipment and Tools
- Use, Maintenance and Inspection of Machine Safeguards
- Inspecting Material, Equipment and Fixtures for Defects
- Safe Moving of Materials
- Safe Evacuation of Facility
- Response to Shop Emergencies
- Material Safety Data Sheets (MSDS)
- Confined Spaces
- Lock /Tag Out Practices

**Regulatory Compliance**

- Role of OSHA/EPA in the Workplace
- Regulations Governing Safe Use of Equipment
- Hazardous Material Information System Labeling and Storage (HMIS)
- Hazardous Material Handling and Disposal (HAZMAT)
- Hazardous Material Communication (HAZCOM)

**5. SUPPLY CHAIN LOGISTICS: Plan and monitor the movement and storage of materials and products in coordination with suppliers, internal systems and customers.**

**Entry-Level Critical Work Functions:**

- Ship and receive products and materials.

**Entry-Level Technical Content Areas:**

**Basics of Supply-Chain Management**

- Elements of the Supply Chain
- Just-in-Time/Lean Manufacturing

**Managing Inventory**

- Inventory Forecasting
- Ordering Materials and Supplies
- Inventory Monitoring and Audits
- Stock Rotation Requirements
- Expediting

**Work Flow**

- Material Handling
- Plant Facility and Capacity
- Production Scheduling

**Production Systems**

- Lead and Cycle Time
- Change Orders, Bills of Material, Work Orders, etc.

**Packaging and Distributing Product**

- Packaging Product
- Labeling Product- Inventory Tags and Bar Codes
- Warehouse Management Systems
- Transportation Methods
- Customs and Export Control (Basic Paperwork)

**6. QUALITY ASSURANCE AND CONTINUOUS IMPROVEMENT: Ensure product and process meets quality system requirements as defined by customer specifications.**

**Entry-Level Critical Work Functions:**

- Ensure materials, processes and final product meet quality specifications.
- Support and maintain quality systems.

**Entry-Level Technical Content Areas:**

**Quality Assurance**

- Meeting Customer Needs
- Lean Manufacturing
- Quality Management Systems and Tools
- Industry Standards

**Improving Quality**

- Introduction to Statistical Process Control
- Sampling and Charting
- Problem Solving Tools

**Inspecting for Quality**

- Inspecting Raw/Incoming Materials
- Inspecting In-Process Product
- Inspecting Final Products

**Continuous Improvement**

- Business Process Reengineering
- Systems Analysis
- Data Analysis
- Performance improvement strategies

## Tier 4—Industry-wide Technical Competencies - Technician Level

Industry-Wide Technical Competencies					
Manufacturing Process Development/Design	Production	Maintenance, Installation & Repair	Supply Chain Logistics	Quality Assurance/Continuous Improvement	Health & Safety

4

**1. MANUFACTURING PROCESS DESIGN/DEVELOPMENT:** Research, design, implement, and continuously improve the manufacturing process to ensure product meets customer needs.

**Technician-Level Critical Work Functions:**

- Interpret and clarify customer expectations and product specifications.
- Design manufacturing production and production support systems.

**Technician-Level Technical Content Areas:**

**Research & Development**

- Product R&D
- Process R&D
- Market/Sales/Life Cycle Analysis
- Intellectual Property Protection

**Product Realization**

- Design for Manufacturing and Design for Logistics
- Production System Design and Development
- Equipment/Tool Design and Development
- Support Systems Design and Development
- Development of Prototype Processes and Products
- Production System Design, Testing and Costing

**Technology Applications**

- Integrated Graphics Technologies
- Machining and Forming Technologies
- Nano- and Micro-nano-Technology
- Alternative Energies Technologies

**Troubleshooting Processes**

- Advanced Fault Finding Skills on Actual Equipment
- Setup of SPC
- Data Analysis and Verification
- Data Interpretation and Corrective Action Implementation

**2. PRODUCTION:** Set up, operate, monitor, control and improve manufacturing processes and schedules to meet customer requirements.

**Technician-Level Critical Work Functions:**

- Develop manufacturing process plans and documentation.
- Monitor manufacturing processes and systems.
- Manage continuous improvement process.

**Technician-Level Technical Content Areas:**

**Production Planning and Work Flow**

**Production Components**

- Continuous Improvement
- Time, Materials and Costs
- Production Systems

**Advanced Production/Process Operations**

- Assembly Processes
- Fabrication Processes
- Electrical/Electronics Manufacturing Processes
- Process Overview Knowledge
- Finishing Processes
- Continuous Flow/Line Balancing Processes
- Cell Culture/Fermentation/Media Processes
- Recovery/Filtration Processes

**Production/Process Monitoring**

- Controlling Process Flow
- Documentation and Reporting
- Performance of Analytical Tests
- Calibration and Troubleshooting
- Environmental Parameters
- Write/Execute Protocols

**Manufacturing Management**

- Organizational Design and Management
- Project Management
- Personnel Management Methods
- Human Behavior/Motivation/Leadership
- Material and Resource Management
- Training Skills

**3. MAINTENANCE, INSTALLATION AND REPAIR:** Maintain and optimize manufacturing equipment and systems.

**Technician-Level Critical Work Functions:**

- Support the installation, customization or upgrading of equipment.
- Coordinate preventive maintenance to ensure production process runs smoothly.

**Technician-Level Technical Content Areas:**

**Advanced Installation and Repair Skills**

- Mechanical Power Transmissions Systems
- Piping Operations

**Advanced Maintenance and Troubleshooting Skills**

- Process Controls
- Pump Systems
- Thermal Systems (HVAC)
- Refrigeration Systems
- Mechanical/Fluid Power Systems
- Separation/Heat Exchange Systems
- Water Treatment/Destruction Systems
- High Voltage/Utility Systems
- Programmable Logic Controlled Industrial Equipment

### **Reliability and Maintainability**

- Basic Reliability Models
- Reliability of Systems
- Design for Reliability
- Design for Maintainability
- Investigative Techniques
- Analysis of Failure Data

## **4. HEALTH AND SAFETY: Maintain a safe, healthy work environment**

### **Technician-Level Critical Work Functions:**

- **Conduct health, safety and/or environmental incident and hazard investigations.**
- **Conduct preventive health, safety and/or environmental incident and hazard inspections.**
- **Implement continuous improvement in health, safety and/or environmental practices.**

### **Technician-Level Technical Content Areas:**

#### **Incident and Hazard Investigations**

- Investigation of Health, Safety, or Environmental Incidences/Hazards
- Documentation of Findings
- Developing Corrective Actions
- Follow-up Investigation
- Violations Reports to Proper Authorities
- Workers Compensation

#### **Additional Knowledge**

- Insurance (Property)
- Life Safety Code/National Fire Protection Association 101
- Engineering Principles for Safety

#### **Environmental Protection/Waste Management**

- Chemical Hazard Assessment

#### **Preventive Health, Safety or Environmental Inspections**

- Audit of Records and Documentation
- Conducting Inspections
- Clean Room Protocol
- Documentation of Inspection Findings
- Emergency Response Preparedness
- Fire Protection and Control

#### **Continuous Improvement in Health and Safety**

- Root Cause Analysis
- Analysis of Health/Safety/Environmental Data
- Identification of Projects and Priorities

## **5. SUPPLY CHAIN LOGISTICS: Plan and monitor the movement and storage of materials and products in coordination with suppliers, internal systems and customers.**

### **Technician-Level Critical Work Functions:**

- **Manage purchasing and just-in-time materials flow, shipping and receiving, packaging and transportation.**
- **Control inventory of materials and products.**
- **Develop and maintain production/delivery schedules and supplier networks.**

## **Technician-Level Technical Content Areas:**

### **Supply-Chain Management**

- Manufacturing Resources Planning
- Collaborative, Planning, Forecasting and Replenishment
- Vendor Managed Inventory Systems
- Centralized versus Decentralized Control
- E-Business and Direct Shipment

### **Automated Material Handling**

- Automated Material Handling and Distribution Systems
- Integrated Supply Chain Information Technology

### **Resources Planning**

- Demand Management
- Sales and Operations Planning
- Master Scheduling
- Measuring Business Performance

### **Detailed Scheduling and Planning**

- Techniques of Inventory Management
- Detailed Material Planning

### **Executing Operations**

- Procurement and External Source of Supply
- Prioritizing and Sequencing Work
- Executing Plans and Implementing Controls
- Evaluating Performance
- Ergonomics
- Sharing and Collaboration across the Supply Chain

### **Awareness of Global Impacts**

- Intellectual Property
- Taxes and Duties
- Shipping, Receiving, and Freight
- Customs and Export Control (Legal Aspects)

**6. QUALITY ASSURANCE AND CONTINUOUS IMPROVEMENT:** Ensure product and process meets quality system requirements as defined by customer specifications.

## **Technician-Level Critical Work Functions:**

- **Monitor production for product and process quality.**
- **Employ audits and inspections to maintain the quality and continuous improvement process.**
- **Correct the product and process to meet quality standards.**
- **Suggest and/or implement continuous improvement actions.**



## **Technician-Level Technical Content Areas:**

### **Probability and Statistics**

#### **Data Analysis and Presentation**

- Presentation Skills
- Query-Based Intermediate Computer Skills
- Facilitation Skills
- Business Case

#### **Statistical Process Control Methods**

- Factor Analysis
- Capability Analysis
- Inspection/Test/Validation
- Reliability Analysis
- Acceptance Sampling

#### **Quality Assurance Audits**

- ISO 9000
- Audit Procedures

#### **Corrective and Preventive Actions**

- Eliminating Non-Conformities
- Verification and Documentation
- Documentation Creation

#### **Benchmarking and Best Practice**



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