**College:**

**Southeastern Community College**

**Signature Program:**

**Manufacturing Technician / Technology – noncredit Certified Production Technician**

Course Quality Standards:

SCC – Manufacturing Technician / Technology - XXET-XETSH-SDOEE01
CPT Safety
SCC – Manufacturing Technician / Technology - XXET-XETQC-SDOEE10
CPT Quality Practices and Measurement
SCC – Manufacturing Technician / Technology - XXET-XETER-SDOEE06
CPT Manufacturing Processes and Production
SCC – Manufacturing Technician / Technology - XXMR-XMRMR-SDOEE11
CPT Maintenance Awareness

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

# COURSE QUALITY STANDARDS

**COURSE TITLE: CPT Safety**

**COURSE NUMBER: XXET-XETSH-SDOEE01**

**CONTACT HOURS: 24 LECTURE: 24 LAB: 0 OTHER:**

**COURSE DESCRIPTION:**

This course provides students with knowledge to identify and address safety issues within a manufacturing environment. Students will utilize the acquired competencies in this course to take the MSSC Safety 3rd party certification exam, one of four exams required for the MSSC Certified Production Technician.

**PREREQUISITES: NCRC Silver level**

**COREQUISITES:**

**QUALITY STANDARDS**

Upon successfully completing this course, students should be able to:

## 1. Describe and Demonstrate Key Concepts of a Safe and Productive Workplace:

1. Understand ways in which manufacturing affects the national economy and standard of living
2. Understand ways in which the global economy affects manufacturers
3. Understand major sub-industries within manufacturing
4. Understand common safety practices and systems
5. Understand responsibilities of a frontline production worker in a high-performance, safety-conscious work organization
6. Recognize different and common needs of internal and external customers
7. Maintain customer contact about product specifications and printed specs to ensure understanding of needs, including those related to safety

## 2. Describe and Demonstrate Key Concepts to Safety procedures:

1. Locate and use Safety Data Sheets (SDS)
2. Understand company first aid or first response procedures
3. Understand material handling techniques to safely move materials
4. Respond proactively to a safety concern and document occurrences
5. Know where to find emergency exits
6. Understand various emergency alarms and procedures
7. Understand clean-up procedures for spills
8. Understand lock out/tag out requirements

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

9. Inspect work area and report possible safety risks
10. Understand machinery and equipment safety functions to determine if all safeguards are operational
11. Understand safety procedures in case of smoke or chemical inhalation
12. Follow procedures for handling hazardous material
13. Develop safety checklists
14. Follow equipment shutdown procedures
15. Perform leak checks to determine if toxic or hazardous material is escaping from a piece of equipment
16. Understand proper and safe installation techniques as described in manuals, checklists and regulations

## 3. Define Personal Safety Practices:

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

## 4. Characterize Key Safety Policies and Regulation Requirements:

1. Follow basic filing procedures to properly store inspection records
2. Understand safety requirements and environmental regulations related to performing inspections
3. Understand policies and procedures needed to perform audits and train employees about hazardous conditions
4. Understand company safety standards for handling potential hazards
5. Store, identify and use hazardous materials and pressurized vessels safely
6. Understand OSHA and other health and safety requirements as applied to the workplace
7. Understand government policies, procedures and regulations governing the safe use of equipment
8. Follow procedures to prevent or reduce emissions and spills
9. Understand Hazardous Materials (HAZMAT) procedure information
10. Understand the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
11. Understand Safety Data Sheets (SDS)
12. Understand applicable safety standards
13. Understand which tools and equipment require safety certification
14. Understand what the law requires companies to post or publish in order to keep employees abreast of OSHA and other government regulations
15. Understand EPA required documentation for disposal of hazardous waste generated during maintenance or transportation of contaminated items
16. Understand accident documentation procedures

## 5. Examine the Impact of Safety-related Maintenance Procedures:

1. Understand equipment operation and design parameters to determine if machine is operating safely
2. Review environmental data systems in the factory
3. Make adjustments to equipment to ensure that it is operating within established safety and environmental parameters

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

4. Monitor equipment for unsafe conditions

## 6. Describe and Identify Safety Training Requirements:

1. Develop and/or deliver safety training per guidelines
2. Understand health and safety education requirements
3. Identify safety training courses
4. Understand equipment manual and standard practice manual to repair equipment safely
5. Understand certifications needed for regulatory compliance (i.e., Cardio Pulmonary Resuscitation (CPR), fire extinguisher, and blood-borne pathogens)
6. Conduct equipment safety demonstrations
7. Train other workers in proper safety procedures during maintenance process
8. Understand the tools and materials needed to operate equipment to train others
9. Use monthly safety meetings to improve the safety environment and communicate changes in regulations

## 7. Demonstrate Communication Skills that Enhance Safety:

1. Understand ways to improve reading, listening and writing skills
2. Understand techniques for making effective presentations to internal and external customers, including safety orientations
3. Use different forms of communication, such as e-mail, fax and phone
4. Provide effective feedback and making suggestions
5. Communicate customer needs effectively to others including shift-to-shift, co-workers and managers, including needs that impact safety.

## 8. Characterize Teamwork Skills that Enhance Safety:

1. Understand the characteristics of a high-performance team
2. Understand roles and responsibilities of production team members
3. Use teamwork to deal with customer requests
4. Align team goals to customer and business production needs
5. Ensure that team goals are specific, documented, measurable and achievable
6. Communicate production information to team members
7. Use team problem-solving and conflict resolution processes

## 9. Develop Training Skills that Enhance Safety:

1. Understand how training needs are assessed regularly to identify new requirements and training issues
2. Conduct training in an effective and appropriate manner to achieve training goals
3. Ensure training materials are documented and available
4. Ensure training is relevant to equipment, tools, materials and processes at the workstation
5. Provide appropriate cross-training
6. Ensure that training documentation is accurate and current and meets all company and regulatory requirements

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

## ASSESSMENT

| Standard | Quiz | Group Activity | Problem Sets | Group Discussion | Other |
|---|---|---|---|---|---|
| 1. Describe and Demonstrate Key Concepts of a Safe and Productive Workplace: | X | X | X | X | MSSC on-line learning tools<br>OSHA General Industry instruction |
| 2. Describe and Demonstrate Key Concepts to Safety procedures: | X | X | X | X | MSSC on-line learning tools<br>OSHA General Industry instruction |
| 3. Define Personal Safety Practices: | X | X | X | X | MSSC on-line learning tools<br>OSHA General Industry instruction |
| 4. Characterize Key Safety Policies and Regulation Requirements: | X | X | X | X | MSSC on-line learning tools<br>OSHA General Industry instruction |
| 5. Examine the Impact of Safety-related Maintenance Procedures: | X | X | X | X | MSSC on-line learning tools<br>OSHA General Industry instruction |
| 6. Describe and Identify Safety Training Requirements: | X | X | X | X | MSSC on-line learning tools<br>OSHA General Industry instruction |
| 7. Demonstrate Communication Skills that Enhance Safety: | X | X | X | X | MSSC on-line learning tools<br>OSHA General Industry training |
| 8. Characterize Teamwork Skills that Enhance Safety: | X | X | X | X | MSSC on-line learning tools |
| 9. Training Skills that Enhance Safety: | X | X | X | X | MSSC on-line learning tools |

PREPARED BY: Susan Dunek
DATE: November 11, 2015
DATE REVISED:

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

# COURSE QUALITY STANDARDS

**COURSE TITLE: CPT Quality Practices and Measurement**

**COURSE NUMBER: XXET-XETQC-SDOEE10**

**CONTACT HOURS: 24 LECTURE: 24 LAB: 0 OTHER:**

**COURSE DESCRIPTION:**

This course provides students a basic understanding of manufacturing blueprints, quality practices, and measurement. At the end of this module, students will be able to read basic detail drawings for part inspection, identify quality problems, and verify component quality. Students will utilize the acquired competencies in this course to take the MSSC Quality Practices and Measurement 3rd part certification exam, one of four exams required for the MSSC Certified Production Technician.

**PREREQUISITES: NCRC Silver level**

**COREQUISITES:**

**QUALITY STANDARDS**

Upon successfully completing this course, students should be able to:

1. **Describe or Identify Overall Quality Processes:**
    1. Understand quality standards and how they apply to products to make effective decisions about quality problems
    2. Understand quality procedures and product specifications to identify nonconformance
    3. Understand roles and responsibilities for quality in an organization
    4. Identify product defects and defect patterns
    5. Check and test good products and non-conforming products
    6. Understand corrective action methods for dealing with non-conformances to avoid future occurrences
    7. Follow procedures for rejecting substandard products
    8. Develop and document quality procedures, check lists and methods
    9. Identify inaccuracies in quality data and responding to them
    10. Understand quality terminology
    11. Understand company quality assurance procedures

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

2. **Describe and Demonstrate the Concept of Quality Systems and Inspection Tools:**
   1. Understand quality systems such as Statistical Process Control (SPC), Six Sigma, Total Quality Management (TQM), Lean Management, "Plan-Do-Check-Act" and International Organization of Standardization standards, especially ISO 9001 for manufacturers
   2. Select and use quality systems to identify problems and record quality issues
   3. Use statistical quality tools (e.g., Root Cause Failure Analyses and Pareto charts) to reach accurate decisions about quality data
   4. Accurately troubleshoot and categorize defect types to determine root cause
   5. Create control charts (e.g., variables and attributes)
   6. Record and analyze quality issues in the production process, using tools such as Root Cause Failure Analyses (RCFA)
   7. Use Pareto analysis to identify priorities for solving multiple sub –standard product problems
   8. Determine accuracy and precision when using measuring equipment
   9. Use performance indicators that can be readily understood by operators
   10. Use inspection tools, equipment and procedures
   11. Understand inspection equipment calibration standards and requirements
   12. Verify calibration of inspection equipment
   13. Use appropriate automated inspection system
   14. Use hand-held inspection devices to examine materials
   15. Maintain and store inspection tools

3. **Describe and Demonstrate the Importance of Corrective Action:**
   1. Determine appropriate corrective action
   2. Follow corrective action procedures to follow up on quality problems and corrective measures
   3. Understand health and safety standards to ensure quality problems are addressed correctly without impairing health and safety
   4. Conduct follow-up activities to validate that corrective action has been taken
   5. Access and previous documentation to help develop solutions
   6. Know when to stop process to prevent production of defective product
   7. Tag and segregate non-conforming material
   8. Investigate non-conformances (e.g., rejection tags) to determine root cause and recommend corrective action

4. **Characterize Quality Documentation to:**
   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. Understand documentation process and requirements to ensure verifiable evidence of product quality
   4. Follow quality system protocol for performing an audit
   5. Follow procedure for reviewing quality problems with operators to provide feedback
   6. Follow correct approval procedures to document inspection results
   7. Follow procedures for recording and storing product history and maintaining records

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

8. Use route sheets and statistical method charts to document process
9. Understand follow-up and reporting documentation procedures to ensure proper communications

**5. Demonstrate Blueprint Reading Fundamentals to:**

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
4. Interpret geometric dimensioning and assembly tolerances on a drawing
5. Interpret of title blocks
6. Interpret assembly drawings

**6. Demonstrate Basic Measurement Techniques to:**

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

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

## ASSESSMENT

| Standard | Quiz | Group Activity | Problem Sets | Group Discussion | Other |
|---|---|---|---|---|---|
| 1. Describe or Identify Overall Quality Processes: | X | X | X | X | MSSC on-line learning tools |
| 2. Describe and Demonstrate the Concept of Quality Systems and Inspection Tools: | X | X | X | X | MSSC on-line learning tools |
| 3. Describe and Demonstrate the Importance of Corrective Action: | X | X | X | X | MSSC on-line learning tools |
| 4. Characterize Quality Documentation to: | X | X | X | X | MSSC on-line learning tools |
| 5. Demonstrate Blueprint Reading Fundamentals to: | X | X | X | X | MSSC on-line learning tools |
| 6. Demonstrate Basic Measurement Techniques to: | X | X | X | X | MSSC on-line learning tools |

PREPARED BY: Susan Dunek
DATE: November 11, 2015
DATE REVISED:

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

# COURSE QUALITY STANDARDS

**COURSE TITLE: CPT Manufacturing Processes and Production**

**COURSE NUMBER: XXET-XETER-SDOEE06**
**CONTACT HOURS: 27 LECTURE: 27 LAB: 0 OTHER:**

**COURSE DESCRIPTION:**

This course provides students a basic understanding of manufacturing processes and production techniques. Students will utilize the acquired competencies in this course to take the MSSC Manufacturing Processes & Production 3rd party certification exam, one of four exams required for the MSSC Certified Production Technician.

**PREREQUISITES: NCRC Silver level**

**COREQUISITES:**

**QUALITY STANDARDS**

Upon successfully completing this course, students should be able to:

1. **Describe Work Flow Planning and Control:**
    1. Understand principles of Lean Manufacturing and High Performance Work Organizations
    2. Make job assignments and coordinating workflow
    3. Ensure appropriate resources are available to meet customer specifications
    4. Ensure set-up and operation procedures are available and up-to-date
    5. Read and interpret a production schedule and manufacturing work order
    6. Understand production process, including flow and bottlenecks
    7. Understand lead-time required for a production plan
    8. Read and interpret bills of materials and routing sheets
    9. Understand methods of productivity measurement and improvement
    10. Understand principles and practice of Just-in-time (JIT) inventory control
    11. Perform a physical inventory

2. **Identify and Characterize Production Equipment Operations:**
    1. Start and operate production machines
    2. Perform emergency shutdown of production machines
    3. Recognize and address machine malfunctions
    4. Understand common types of mechanisms used in machines
    5. Understand ways in which force and torque are used in machine operations
    6. Understand impact of friction on machine operation and methods
    7. Understand use of cams
    8. Understand ways in which machines use pulley and gear drives

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

9. Understand which manufacturing processes are used to make and finish parts
10. Use basic types of manual machine tools, such as drill press and cutoff saw
11. Understand basic machine tooling
12. Understand basic casting, molding and stamping processes
13. Understand basic direct digital and additive manufacturing

## 3. Demonstrate Understanding of Production Materials, Tools and Equipment:

1. Understand various materials used in production
2. Understand machinery operation, set up and testing
3. Read and interpret gauges (i.e., analog, digital and vernier)
4. Determine whether additional tools need to be purchased
5. Understand lubricants and coolants to make the proper selection
6. Set up, program and operate computerized control process
7. Understand equipment capabilities to maximize productivity
8. Make machine adjustments
9. Order tools and materials

## 4. Demonstrate Key Concepts Related to Work Orders and Documentation:

1. Interpret work orders to meet customer needs
2. Review order sheets to determine if on-site adjustments are needed
3. Use diagrams and technical drawings
4. Interpret route sheets and operation sheets to set-up and operate machine
5. Complete compliance tag to indicate that the sub-assembly meets the customer requirements
6. Determine packing requirements based upon customer specifications
7. Determine packing requirements based upon available packing materials
8. Determine the safest method of shipping the product based upon available packing materials

## 5. Characterize Advanced Technologies Present in Manufacturing:

1. Understand advanced technologies that are now in common use, such as Computer Numerically Controlled machines (CNC), Industrial Robotics, Programmable Logic Controllers (PLC), Lean Processes, Sensors and Lasers
2. Understand emerging technologies that could become commonly used in the next one to four years, such as Additive Manufacturing (3D Printing), Advanced Materials, Internet of Things, Mass Customization, Mechatronics, Mobile Internet, Nanotechnology and Next Generation Robotics

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

## ASSESSMENT

| Standard | Quiz | Group Activity | Problem Sets | Group Discussion | Other |
|---|---|---|---|---|---|
| 1. Describe Work Flow Planning and Control: | X | X | X | X | MSSC on-line learning tools |
| 2. Identify and Characterize Production Equipment Operations: | X | X | X | X | MSSC on-line learning tools |
| 3. Demonstrate Understanding of Production Materials, Tools and Equipment: | X | X | X | X | MSSC on-line learning tools |
| 4. Demonstrate Key Concepts Related to Work Orders and Documentation: | X | X | X | X | MSSC on-line learning tools |
| 5. Characterize Advanced Technologies Present in Manufacturing: | X | X | X | X | MSSC on-line learning tools |

PREPARED BY: Susan Dunek
DATE: November 11, 2015
DATE REVISED:

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

# COURSE QUALITY STANDARDS

**COURSE TITLE: CPT Maintenance Awareness**

**COURSE NUMBER: XXMR-XMRMR-SDOEE11**
**CONTACT HOURS: 27 LECTURE: 27 LAB: 0 OTHER:**

**COURSE DESCRIPTION:**

This course provides students a basic understanding and awareness of mechanical systems and maintenance within a manufacturing environment. Students will utilize the acquired competencies in this course to take the MSSC Maintenance Awareness 3rd party certification exam, one of four exams required for the MSSC Certified Production Technician.

**PREREQUISITES: NCRC Silver level**

**COREQUISITES:**

**QUALITY STANDARDS**

Upon successfully completing this course, students should be able to:

1. **Describe the Overall Maintenance Process:**
   1. Understand principles of Total Productive Maintenance (TPM)
   2. Understand what equipment is to be maintained and monitored
   3. Troubleshoot to identify a problem with equipment
   4. Follow preventive maintenance schedules
   5. Understand job specific guidelines or collective bargaining agreement that affect maintenance
   6. Recognize significant wear and tear on equipment components
   7. Follow procedures for logging repairs and work order requests
   8. Understand the most common causes of failure of equipment to diagnosis problem quickly
   9. Understand what equipment alarms mean
   10. Make on-process adjustments during production

2. **Identify Uses of Maintenance Tools and Equipment:**
   1. Understand materials management to know what is recyclable and what is not
   2. Use appropriate maintenance tools to maintain machines
   3. Use monitoring or diagnostic devices to find out when equipment is operating correctly

3. **Explain Key Concepts Involved in Documentation of Maintenance:**
   1. Ensure that equipment is producing a quality product using statistical methods charts
   2. Understand which forms and procedures to correctly documenting processes (e.g., preventative maintenance forms)

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

3. Repair equipment using diagrams, schematics, manuals and specifications
4. Document repairs, replacement parts, problems and corrective actions to maintain log to determine patterns of operation
5. Review maintenance log/checklist to ensure that recommended preventative procedures are followed

## 4. Identify Maintenance-Related Safety Actions:

1. Verify machine safety through proper set-up
2. Understand safety procedures to prevent accidents
3. Know the certification/license requirements to operate specific equipment
4. Use and store hazardous materials and chemicals (e.g., compliance with MSDS)
5. Understand Lock out/Tag out policies and procedures
6. Visually inspect equipment to ensure safety compliance before operating
7. Identify and report unsafe work conditions
8. Understand materials management to know what is recyclable and what is not

## 5. Identify and Describe Potential Maintenance Issues with Basic Production Systems:

1. Understand electrical systems reliability issues, including knowledge of when to inform maintenance personnel
2. Understand pneumatic systems reliability issues, including knowledge of when to inform maintenance personnel
3. Understand hydraulic systems reliability issues, including knowledge of when to inform maintenance personnel
4. Understand machine automation systems reliability issues, including knowledge of when to inform maintenance personnel

## 6. Describe Proper Lubrication Procedures to:

1. Take and analyze oil samples
2. Use correct lubricants for various types of equipment
3. Operate grease guns correctly for various types of lubrication
4. Store and dispose of lubricants safely

## 7. Describe Factors Influencing Bearings and Coupling Reliability:

1. Understand proper functioning of mechanical power transmission equipment, including knowledge of when to inform maintenance personnel
2. Understand proper functioning of bearings and shafts, including knowledge of when to inform maintenance personnel
3. Understand proper functioning of couplings, including knowledge of when to inform maintenance personnel

## 8. Describe Factors Influencing Belt and Chain Drive Reliability:

1. Understand proper functioning of belt drive systems, including knowledge of when to inform maintenance personnel
2. Understand proper functioning of roller chain drive systems, including knowledge of when to inform maintenance personnel
3. Understand proper adjustment of chain sags is recognized, including knowledge of when to inform maintenance personnel

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership

## ASSESSMENT

| Standard | Quiz | Group Activity | Problem Sets | Group Discussion | Other |
|---|---|---|---|---|---|
| 1. Describe the Overall Maintenance Process: | X | X | X | X | MSSC on-line learning tools |
| 2. Identify Uses of Maintenance Tools and Equipment: | X | X | X | X | MSSC on-line learning tools |
| 3. Explain Key Concepts Involved in Documentation of Maintenance: | X | X | X | X | MSSC on-line learning tools |
| 4. Identify Maintenance-Related Safety Actions: | X | X | X | X | MSSC on-line learning tools |
| 5. Identify and Describe Potential Maintenance Issues with Basic Production Systems: | X | X | X | X | MSSC on-line learning tools |
| 6. Describe Proper Lubrication Procedures to: | X | X | X | X | MSSC on-line learning tools |
| 7. Describe Factors Influencing Bearings and Coupling Reliability: | X | X | X | X | MSSC on-line learning tools |
| 8. Describe Factors Influencing Belt and Chain Drive Reliability: | X | X | X | X | MSSC on-line learning tools |

PREPARED BY: Susan Dunek
DATE: November 11, 2015
DATE REVISED:

This workforce solution is funded by the I-AM Consortium which is 100% financed through a $12,951,165 grant from the Department of Labor's Employment & Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership