Lansing Community College

Course Cover Sheet

M-CAM Training Area:
☐CNC/Machining ☐Multi-Skilled Mechatronics ☒Production Operation ☐Welding/Fabrications

Program(s): Certified Production Technician

Course: CPT Maintenance Awareness

Course Description:
This 48-hour instructor-led, blended media training program provides participants with an awareness of potential maintenance issues with basic production systems.

Upon successful completion, participants will be able to perform preventive maintenance, routine repair, and perform housekeeping to maintain a production schedule within the manufacturing environment.

Participants who complete this class will be eligible to take the MSSC CPT Maintenance Awareness assessment, which is part of the Certified Production Technician certification.

Delivery method is hybrid.

Date Created: August, 2015. Revised May, 2016

Employer/Industry Partner: various manufacturing companies in Mid-Michigan. Course guidelines and material provided by MSSC.

Faculty Developer(s)/Instructional Designers(s): Sid Mosley/John Jensen/Scott Poe/Ann Lapo

College Contact: Jill Doederlein
Phone: 517.483.9665
Email: doederj@lcc.edu

Additional Information/Comments: Developed to answer the needs of manufacturing companies served by Lansing Community College. Upon piloting the MSSC CPT courses, it was discovered that there was a lack of hands-on activities to solidify learning. LCC faculty worked to enhance online content provided by ToolingU (thru August, 2015) and MSSC (replaced ToolingU in September, 2015). Amatrol activities were also incorporated into CPT Maintenance Awareness.

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution 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, warrantees, 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.

DESCRIPTION:
This 48-hour instructor-led, blended media training program provides participants with an awareness of potential maintenance issues with basic production systems.
Upon successful completion, participants will be able to perform preventive maintenance, routine repair, and perform housekeeping to maintain a production schedule within the manufacturing environment.

Participants who complete this class will be eligible to take the MSSC CPT Maintenance Awareness assessment, which is part of the Certified Production Technician certification.

TOTAL TIME REQUIREMENT for the course is 48 hours.

PREREQUISITES: Reading Level 4. Basic computer skills.

OBJECTIVES:
After completing this course, the student should be able to:
- Perform preventive maintenance and routine repair.
- Monitor indicators to ensure correct operations.
- Perform all housekeeping to maintain production schedule.
- Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems with:
  - Electrical systems
  - Pneumatic systems
  - Hydraulic systems
  - Machine automation systems
  - Lubrication processes
  - Bearings and couplings
  - Belts and chain drives
- Monitor environmental aspects at each stage of production.
- Implement continuous improvement in environmental assurance practices.
- Use advanced materials to reduce waste.
- Reprocess materials by recycling and reuse throughout product life cycle to to optimize waste reduction.
- Take the MSSC CPT Maintenance Awareness assessment.

MATERIALS:
- MSSC online content
- Instructor-developed handouts
- MSSC CPT Maintenance Awareness registration (for first time participants) and assessments.

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

GRADING POLICY:

- Satisfactory completion of training (at least 75%) recommended.

College Grading Standards	Percent
4.0 Excellent	91-100%
3.5	86-90%
3.0 Good	81-85%
2.5	76-80%
2.0 Satisfactory	71-75%
1.5	66-70%
1.0	60-65%
0.0	0-59%

ACCEPTABLE USE POLICY:
Computer Resources

Use of College-owned computer resources is a privilege extended by the College to students, employees, and other authorized users as a tool to promote the mission of the College. All users agree to be bound by the terms and conditions of the LCC Acceptable Use Policy at the time they complete an account application form. Copies of the LCC Acceptable Use Policy are available at the Library Circulation Desk and may also be accessed on the World Wide Web. The URL is http://www.lcc.edu/policy/policies_1.aspx#ACCEPTABLE_USE_POLICY

Transfer Potential

For transferability information, please consult the Transfer Equivalency Information located at the LCC website at http://www.lcc.edu/transfer. For additional transferability information, contact the LCC Academic Advising Center, (517) 483-1904.

The MACRAO Transfer Agreement simplifies the transfer of students from one Michigan institution to another. The most current MACRAO Transfer Agreement information can be found at http://www.lcc.edu/transfer/macrao_agreement.aspx.

Student Code of Conduct and General Rules and Guidelines

LCC supports a positive educational environment that will benefit student success. In order to ensure this vision, the College has established the LCC Student Code of Conduct and the Student General Rules and Guidelines to ensure the protection of student rights and the health and safety of the College community, as well as to support the efficient operation of College programs. In addition, the College has established guidelines for the redress of grievances by individuals accused in such proceedings. A copy of the most current Code can be found on the College's website at http://www.lcc.edu/catalog/policies_procedures/studentrulesguidelines.aspx#code.

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

Program Description and Couse Outline:

This 48-hour, instructor-led, blended media training program provides participants with an awareness of potential maintenance issues with basic production systems. Upon successful completion, participants will be able to perform preventive maintenance, routine repair, and perform housekeeping to maintain a production schedule within the manufacturing environment.

Detailed course objectives are provided in your participant binder.

TAKE YOUR COURSE MODULES IN THE FOLLOWING ORDER (Unless otherwise directed)

ELECTRICAL MODULES: Instructor, John Jensen	**14 hours** (May 19-31)
Basic Electrical Circuits* (See MSSC Unit 55)	
Electrical Measurement* (See MSSC Unit 56)	
Electric Power* (See MSSC Unit 57)	
WELDING: (Lessons online)	**4 hours** (June 1-3, 2016)
Basic Welding (see MSSC Unit 54)	
Welding Safety (see MSSC Unit 54)	
MAINTENANCE MODULES: Instructor, Sidney Mosley	**26 hours** (June 6-22, 2016)
Pneumatic Power Systems* (see MSSC Unit 58)	
Hydraulic Power Systems* (see MSSC Unit 59)	End June 10, 2016
Lubrication Concepts* (see MSSC Unit 60)	
Bearings and Couplings* (see MSSC Unit 61)	
Belt Drives* (see MSSC Unit 62)	
Chain Drives* (see MSSC Unit 63)	End June 20, 2016
Machine Control Concepts (online only see MSSC Unit 64)	
Machine Automation (online only see MSSC Unit 65)	End June 22, 2016
REVIEW and MSSC MAINTENANCE AWARENESS ASSESSMENT	**4 hours** (June 23, 2016)

Note: * indicates labs or hands-on activities. Some labs or hands-on activities are by appointment only.

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

Labs or hands-on activities are by appointment only. Participants must schedule their lab times at least 24 hours prior to their attendance in the lab by contacting Ivanna Rodgers at (517) 483-9744 or rodgi@lcc.edu, or by arrangement with the instructor. All labs take place at LCC West Campus.

Student Orientation

Contents:

- Welcome and Program Format
- Contact Information:

  Primary Instructor: Sidney Mosley: 517-974-9229 (cell), mosleys@lcc.edu

  Electrical Instructor: John Jensen: 517-755-9627 (cell), jensenj8@lcc.edu

  TAA Project Manager: Jill Doederlein 517-483-9665 (office), doederj@lcc.edu

  TAA Project Management Technician: Ivanna Rodgers 517-483-9744 (office), or rodgi@lcc.edu
- Sign Up and Get Started: MSSC online material: **mssctraining.com**
- How to Complete a Module
- LCC Acceptable Use Policy
- Lesson Plan/Class Schedule

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

Welcome! Thank you for your interest in the MSSC CPT Maintenance Awareness class. This class is being offered in a hybrid format as a combination of online learning plus in-person/hands-on lab opportunities.

Location and Contact Information:

- The online learning management system used for this program is accessed through **mssctraining.com**. Directions on how to sign up for these modules will be covered in your orientation session.
- In-person sessions with instructors will take place at LCC West Campus: 5708 Cornerstone Dr. Lansing, MI 48917 by appointment only.
- Parking is free.
- Office staff to help you sign up and to answer general questions are located at the Lansing Community College West Campus – Business & Community Institute (BCI) Office in room M105.
- Please call Ivanna Rodgers (517-483-9744) or Jill Doederlein (517-483-9665) for help with signing up with MSSC and for scheduling your instructor sessions.

How to Sign Up and Get Started:

- New Students: Will need to sign up with MSSC. This will be covered in the orientation session.
- Follow the MSSC CPT Maintenance Awareness modules. Individually take online pre-quiz, complete online module, and take post-quiz. It is important that all of these are completed as part of your lesson.
- Modules include a pre-quiz, lessons online, hands-on labs/activities, and a post-quiz. Appointments with the appropriate instructors are needed in order to participate in the labs or other hands-on learning activities. There will be a calendar when instructors are available for appointments if needed. **Labs are strongly recommended**.

How to Complete a Module:

- Go to mssctraining.com/lms
- Logon with your MSSC ID
- Click the appropriate module.
- Take the pre-quiz to start a module.
- Questions or wanting to do the lab and/or hands-on activities, please schedule an appointment with the appropriate instructor. Ivanna Rodgers or Jill Doederlein can help with scheduling instructor sessions.

Acceptable Use at Lansing Community College:

*See **lcc.edu/policy/documents/policies/acceptable-use-policy.pdf***

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

Class Schedule *(Schedule subject to change as class needs warrant.)*	
Class#	Activity (Class sessions meet face-to-face with an instructor for 4 hours per session.)
1	Student Orientation • Time Management Guidelines: ***Make a plan and commit to it!*** Meet the instructors Walk-thru of eLearning component using MSSC Learning Management System. Sign up for modules and get started: • Go to https://www.mssctraining.com/lms/ • Logon with your MSSC ID • Click the appropriate module. • Take the pre-quiz to start a module. **System Requirements** The following are the minimum required system specifications to run the multimedia and access all features on the LMS: • 1 GHz processor • 512 MB RAM • Windows XP or newer • Sound card (or onboard sound) • Video card (or onboard video) capable of 800×600 resolution with 24bit color • Internet Explorer 9 or newer (32bit version required on 64bit machines) in Desktop mode, Firefox 3.6 or newer, Chrome, or Safari • Flash Player 10.1.142 or newer* • Broadband Internet access (DSL/Cable/T1) capable of 384 kbps Orientation to Electrical (Lecture/demonstration/hands-on labs) (2 hours). **NOTE**: Class meets in the Electrical Lab (LCC West Campus U206) **Basic Electrical Circuits (see MSSC Unit 55)** A. Electrical Circuit Components B. Manual Input Devices C. Output Devices **Electrical Measurement (see MSSC Unit 56)** A. Voltage Measurement B. Introduction to Series and Parallel Circuits C. Current Measurement D. Resistance Measurement **Electrical Power (see MSSC Unit 57)** A. Ohm's Law B. Circuit Protection Devices C. AC Motor Connections D. Motor Circuit Components **In Addition:** Student *must* schedule hands-on lab time with an instructor to complete required labs. (up to 12 hours)

2	Pneumatic Power Systems Pre-test (mssc online) *Student should do this prior to attending class.* Lecture/Demonstration (60 minutes) **Introduction to Pneumatics** A. Define pneumatics and give an application B. Describe the functions of basic components of a pneumatic system C. Describe pneumatic pressure and give its units of measurement D. Describe how to read a pressure gage 1. Read a pneumatic pressure gage – (Lab) 2. Describe two methods of representing pressure and read from gauge – (Lab) E. Describe the function of a pneumatic schematic **Pneumatic Power** A. Explain six pneumatic safety rules* B. Describe the function of a pressure regulator valve and give an application* C. Describe the operation of a pressure regulator and give its schematic symbol* D. Connect and adjust a pressure regulator* (Lab) E. Describe the function of an air filter* F. Describe the operation of an air filter and give its schematic symbol **Circuit Connections** A. Describe the function of a pneumatic quick-connect fitting and give its schematic symbol B. Connect a pneumatic hose that uses quick-connect fittings – (Lab) C. Describe the function of a tee and a cross and give their schematic symbols D. Use a tee to connect two circuit branches together – (Lab) E. Use a cross to connect three circuit branches together – (Lab) **Basic Cylinder Circuits** A. Describe the function of an pneumatic cylinder and give an example* B. Describe the operation of a double-acting pneumatic cylinder and give its schematic symbol* • Activity – Basic operation of a double acting cylinder. (Lab) C. Describe the function of a 5-way, 3-position pneumatic DCV and give its application* D. Describe the operation of a 5-way, 3-position pneumatic DCV and give its schematic symbol* E. Describe how DCVs are classified*

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

	F. Describe the function of a DCV schematic* G. Connect an operate a double-acting pneumatic cylinder using a 3 position manually operated DCV* (Lab) * Objectives more critical Lab Activity (2 hours) Self-Review (10 minutes) Post-assessment and Wrap-up (45 minutes) Supplemental lessons online through mssc.com *Student may use these lessons anytime to review and supplement their learning.*
3	Hydraulic Power Systems Pre-test (mssc online) *Student should do this prior to attending class.* Lecture/Demonstration (60 minutes) **Introduction to Hydraulics** A. Define hydraulics and give an application B. Describe the function of a hydraulic schematic C. Describe the operation of a hydraulic power unit **Basic Cylinder Circuits** A. Describe the function of a hydraulic circuit B. Describe the eight basic rules for drawing hydraulic schematics C. Describe the function of a hydraulic cylinder and give an application D. Describe an application of a double-acting cylinder and give its schematic symbol * E. Describe the function of a 3-position, 4 way DCV and give an application * F. Describe the operation of a 3-position, 4-way DCV and give its schematic symbol * **Basic Motor Circuits** A. Describe the function of a hydraulic motor and give an application B. Describe the operation of a hydraulic motor and give an application of each C. List three types of hydraulic motors give an application **Filtration** A. Describe the function of a filter and give its symbol * B. List four placement locations and give its symbol * C. Describe the construction and operation of a suction filter* D. Describe the construction and operation of a pressure filter* E. Describe the construction and operation of a cartridge type filter* F. Describe the construction and operation of a spin-on filter* G. Explain hoe hydraulic filters are rated* H. Define dirt holding capacity* I. Describe how to determine when a filter element needs changing*

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

	* Objectives more critical Lab Activity (2 hours) Self-Review (10 minutes) Post-assessment and Wrap-up (45 minutes) Supplemental lessons online through mssc.com *Student may use these lessons anytime to review and supplement their learning.*
4	Lubrication Concepts Pre-test (mssc online) *Student should do this prior to attending class.* Lecture/Demonstration (60 minutes) **I. Total Productive Maintenance** A. Define preventative maintenance.* B. Define predictive maintenance.* C. Define total productive maintenance.* D. Perform TPM processes.* (Lab) **II. Lubrication Concepts** A. Describe the six functions of a lubricant. B. Describe four types of lubricants and give an application of each. C. Describe the function of nine types of lubricant additives. D. Describe how to analyze an oil sample. E. Describe how to take an oil sample. F. Describe the operation of five types of lubrication application methods and give an example. **III. Oils** A. Describe three types of oils and give an application of each.* B. Define viscosity and give its unit of measure.* C. Describe the application of a viscosimeter and give an application.* D. Describe how oils is specified. E. Select an oil specification for a given application. (Lab) **IV. Greases** A. Describe four types of greases and give an application of each.* B. Describe how greases are specified. C. Select a grease specification for a given application. D. Describe the function of a grease gun* (Lab) • Activity 1: Grease gun component identification E. Explain how to use a grease gun to lubricate a pillow block bearing F. Use a grease gun to lubricate a pillow block bearing. (Lab) * Objectives more critical

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

	Lab Activity (2 hours) Self-Review (10 minutes) Post-assessment and Wrap-up (45 minutes) Supplemental lessons online through mssc.com *Student may use these lessons anytime to review and supplement their learning.*
5	Bearing and Couplings: Pre-test (mssc online) *Student should do this prior to attending class.* Lecture/Demonstration (60 minutes) **Mechanical Power Transmission Safety** D. Describe the function of a mechanical power transmission system and give an advantage. E. Describe five methods of rotary mechanical power transmission and give an application of each. F. Describe five rules of safe dress for working with power transmission equipment.* G. Describe eight mechanical transmission safety rules.* H. Describe the operation of the lockout/tagout system. I. Perform a lockout/tagout. (Lab) **Introduction to Bearings** G. Describe the function of a bearing and give an application. H. Define three types of bearing loads and give an example of each. I. Describe how bearings are positioned to support a load.* J. Describe the operation of a two categories of bearings and give an application of each.* K. Describe four types of antifriction bearings. L. Describe four methods of mounting a shaft bearing and give an example of each. M. Describe eight maintenance steps for antifriction bearings. N. Describe how to install and adjust a pillow block antifriction bearing and shaft.* O. Install and adjust a pillow block antifriction bearing and shaft.* (Lab) **Introduction to Couplings** A. Describe the function of a coupling and give an application. B. Describe the function and application of four categories of mechanical couplings. C. Describe the operation of a flexible jaw coupling.* D. Describe how to install a flexible jaw coupling.* E. Describe the purpose of shaft alignment and give two types of misalignment. F. Describe a general procedure for shaft alignment and give four measurement methods.* **Gear Drives** J. Define a gear drive and give an application.* K. Describe the functions of the main components of a gear drive system.* L. Connect and operate a gear drive system. (Lab) M. Describe how to calculate the mechanical advantage of a gear drive.

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

	N. Calculate and measure the mechanical advantage of a gear drive. (Lab) * Objectives more critical Lab Activity (2 hours) Self-Review (10 minutes) Post-assessment and Wrap-up (45 minutes) Supplemental lessons online through mssc.com *Student may use these lessons anytime to review and supplement their learning.*
6	Belt Drives: Pre-test (mssc online) *Student should do this prior to attending class.* Lecture/Demonstration (60 minutes) **Belt Drive Concepts** A. Describe the function of the three basic components of a belt drive. B. Define pitch and explain its importance. C. Define the pitch circle, pitch diameter and pitch length of a belt drive and explain their importance. D. Describe how to calculate the pulley ratio and explain its importance* E. Calculate pulley ratio. (Lab) F. Describe how to calculate the shaft speed and torque of a belt drive system.* G. Calculate the shaft speed and torque of a belt drive system.* (Lab) **V-Belt Operation** A. List five types of belt drives and give an application of each. B. List three types of V-belts and give an application of each. C. Describe the operation of a fractional HP V-belt drive. D. Describe how to install and align a V-belt drive. E. Verify alignment of a fractional HP V-belt drive with a finished bore. (Lab) **Belt Tensioning** A. Describe how to determine belt tension for an application.* B. Determine the belt deflection force for a given application.* C. Describe two methods of adjusting belt tension.* **Belt Tension Measurement** A. Describe three methods of measuring belt tension and give an application of each.* B. Use a belt tension tester to measure belt tension.* (Lab) * Objectives more critical Lab Activity (2 hours) Self-Review (10 minutes) Post-assessment and Wrap-up (45 minutes) Supplemental lessons online through mssc.com *Student may use these lessons anytime to review and supplement their learning.*
7	Chain Drives:

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

	Pre-test (mssc online) *Student should do this prior to attending class.* Lecture/Demonstration (60 minutes) **Chain Drive Concepts** A. Describe the function of the three basic components of a chain drive.* B. Describe how to calculate sprocket ratio and explain its importance.* C. Calculate sprocket ratio.* (Lab) D. Describe how to calculate the shaft speed and torque of a chain drive system.* E. Calculate the shaft speed and torque of a chain drive system.* (Lab) **Chain Drive Operation** A. List four types of chain drives and give an application of each. B. List four types of roller chain drives and give an application of each. C. Describe the operation of a single strand roller chain drive. D. Describe how to install, align, and remove a roller chain drive with adjustable centers. E. Verify alignment of a roller chain drive.* (Lab) **Chain Tensioning** A. Describe how to determine allowable chain sag for a given application.* B. Determine allowable chain sag for a given application.* (Lab) C. Describe two methods used to adjust chain sag.* **Chain Tension Measurement** A. Describe how to measure chain sag.* B. Use a rule and a straight edge to measure chain sag.* (Lab) C. Adjust chain sag to a specified amount using adjustable centers.* (Lab) **Fixed Center Chain Installation** A. Describe the function and operation of a master link. B. Describe two methods of installing a lightweight chain. C. Install a chain with a master link using sprocket teeth. (Lab) D. Describe the operation of a chain puller. E. Install a chain with a master link using a chain puller.* (Lab) * Objectives more critical Lab Activity (2 hours) Self-Review (10 minutes) Post-assessment and Wrap-up (45 minutes) Supplemental lessons online through mssc.com
8	Review Q & A / test readiness (2 hours) *with an instructor.* MSSC Certification Exam (2 hours) *Proctored by MSSC proctor.*

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and 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 U.S. 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.

Subject Matter Expert (SME) Course Review Summary
College: Lansing Community College
M-CAM Training Area: ☐CNC/Machining ☐Multi-Skilled/Mechatronics ☒Production Operation ☐Welding/Fabrication
Degree Program Name:
Title of Course: MSSC CPT Maintenance Awareness
Subject Matter Expert (SME) Reviewer Information **Name: Robert C. Hess** **Title: Senior Instructional Designer/Trainer** **Phone: 566-322-1033** **Email: bob.hess@mhtechnologies.net** **Organization/Affiliation: MH Technologies**
Attach Resume or provide credentials (showing years of experience and work experience that is relevant to course content):
Synopsis of Findings: 1. **In the electrical section, pages have a gray background, looks bad, uses excess ink. Also, copied pages could be better quality, corners are washed out, looks like a copied image.** 2. **Pneumatic section, red underlining of text on back side of forth sheet, remove spell check error markers.** 3. **Need to verify that all related files for this module are in a common location for printing.**

Reviewers Signature Robert C. Hess Date: 3/10/17

Michigan Coalition for Advanced Manufacturing
Subject Matter Expert Course Review

1. Course Overview and Objectives	Exceptional	Satisfactory	Ineffective
The goals and purpose of the course is clearly stated.		X	
Prerequisites and/or any required competencies are clearly stated.		X	
Learning objectives are specific and well-defined.		X	
Learning objectives describe outcomes that are measurable.		X	
Outcomes align to occupational focus (industry skills and standards).		X	
Comments or recommendations:			

2. Material and Resources	Exceptional	Satisfactory	Ineffective
The instructional materials contribute to the achievement of the course learning objectives.		X	
The materials and resources meet/reflect current industry practices and standards.		X	
The instructional materials provide options for a variety of learning styles.		X	
Resources and materials are cited appropriately. If applicable, license information is provided.		X	
Comments or recommendations:			

3. Learning Activities	Exceptional	Satisfactory	Ineffective
Provide opportunities for interaction and active learning.		X	
Help understand fundamental concepts, and build skills useful outside of the learning object.		X	
Activities are linked to current industry practices and standards.		X	

Comments or recommendations:			
4. Assessment Tools/Criteria for Evaluation	**Exceptional**	**Satisfactory**	**Ineffective**
The course evaluation criteria/course grading policy is stated clearly on syllabus.		X	
Measure stated learning objectives and link to industry standards.		X	
Align with course activities and resources.		X	
Include specific criteria for evaluation of student work and participation.		X	
Comments and recommendations:			
5. Equipment/Technology	**Exceptional**	**Satisfactory**	**Ineffective**
Meets industry standards and needs.		X	
Supports the course learning objectives.		X	
Provides students with easy access to the technologies required in the course/module.		X	
Comments and recommendations:			

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution 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, warrantees, 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.

Robert C. Hess

47737 Remer Ave.
Shelby Twp., MI 48317
586-322-1033
bob.hess@mhtechnologies.net

Qualifications
Dedicated, articulate, and enthusiastic with strong analytical and organizational abilities. Effective communication and interpersonal skills. Ability to work independently or as an integral part of a team to accomplish goals. Experience prioritizing and completing numerous concurrent responsibilities while meeting time and organizational goals. Sound professional attitude, strong work ethic and pride in personal performance.

Experience

2015 – Present **M H Technologies LLC** **Warren, MI**
Senior Instructional Designer/Trainer

- Perform Needs Analysis and quote training programs
- Develop on-line training programs, system manuals, student workbooks, and job aids
- Deliver on-site training programs

2002 – 2015 **R.C. Technologies** **Shelby Twp. MI**
Business Owner – R.C. Technologies

- Research and quote training programs
- Development of training programs for Ford Motors, DaimlerChrysler, General Motors, Kuka Robotics, Fame Conveyor, Lamb Technicon, Delphi, Magna, and SPX
- Design training programs, system manuals, student workbooks, PowerPoint presentations, and job aids
- Deliver on-site training programs
- Professional Industrial photography

1995 – 2002 **DCT Inc.** **Sterling Heights, MI**
Training Designer

- Research and quote training programs
- Design training programs, system manuals, student workbooks, and job aids
- Deliver on-site training programs

1990 – 1995 **Bond Robotics** **Sterling Heights, MI**
Training Manager / Field Service Engineer

- Managed Training Department
- Research and quote training programs
- Design operation and maintenance manuals plus training guides
- Deliver all training programs
- Perform on-site electrical and mechanical customer support for installation, start-up, and debugging of pressroom automation

1986 – 1990 **Robotic Vision Systems, Inc.** **Sterling Heights**
Field Service Engineer / Trainer

- Research, installation, programming and training of 3D vision guided robotic welding and sealant systems for military, aerospace, and automotive industry

Education **1977 – 1981** **Ferris State University** **Big Rapids, MI**

- BSEE