



Moberly Area Community College  
Certified Production Technician



Moberly Area Community College  
101 College Avenue  
Moberly, MO 65270

### Key Personnel Information Contact Sheet

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660-263-4110 ext 11252

## Introductory Overview of Program

### **Certified Production Technician (CPT)**

Program Name	Mechatronics
Credential Type	Certificate
Credential Name	Certified Production Technician
Number of Courses	4
Number of Credits	12
Instructional (CIP) code	15.0499
Industry Name	Manufacturing
Industry (NAICS) Code	31-33 – Manufacturing

#### Industry Certifications:

OSHA 10

MSSC – CPT

#### Delivery Method:

Hybrid - Mobile Lab/In seat

The Certified Production Technician is designed to assist participants/students in gaining entry-level production positions within manufacturing. The positions are generally well-paying machine operator positions, but the certification can also serve as a first step into entry-level maintenance. The CPT is a nationally recognized certification that shows employers the technician has a general understanding of the industry, has been training industry-related topics and understands production needs and methodology. This certification was discussed with our Mechatronics Advisory Committee, which consisted of local industry and representatives in our service area. The committee was on board with the suggested curriculum so therefore the CPT was incorporated in four of our AAS programs, allowing students and participants to earn a stackable credential within their first year. It is also offered as non credit throughout our entire 16 county service region which is allowable through our mobile lab unit. The mobile lab is designed to increase accessibility to the college's hands on CPT labs and additional mechatronics training. MACC will be able to meet the needs of industry/community needs without purchasing expensive equipment for each location.

#### Challenges encountered in developing and launching consisted of three major items:

1. Our full time Mechatronics instructor is working at max load with developing on site lab and curriculum, along with mobile lab.
2. Monetary obligations. Participants struggle with meeting the financial obligation of the certification and have issues gaining WIOA funding.
3. Industry in our northern service region have seen the results of our mechatronics program and more requests have been made for "mechatronics training".

Future plans of the program entail continued efforts with working with industry to gain and train participants throughout our service region. The CPT will continue to be incorporated in four Associate of Applied Science major pathways.

Curriculum Map for: Moberly Area Community College

Curriculum Map for: Certified Production Technician

Key: Introuced    Reinforced    Assessed

Courses	AMD110 Blueprint Reading	IND103 Industrial Safety	IND100 Intro To MFG	IND101 Fund of Maintenance
Program Outcomes				
Understand the importance of workplace safety in today's economy.		IR		RA
Be able to utilize power and hand tools properly and safely.		IRA	RA	A
Validate competency in basic safety protocols with electrical and mechanical equipment.		IRA		
Utilize problem solving techniques to determine the best process for conflict resolutions and improve workplace goals.		IRA	R	
Understand how Statistical Process Control is used in conjunction with lean manufacturing concepts.	R		IRA	
Display an understanding of technical mathematical skills and apply them in workplace situations.			R	IRA
Analyze various blueprints and understand the symbols shown.	IRA			R
Develop an understanding of lean manufacturing and how to improve workplace efficiency.	R		IRA	R

Instructions: Add **courses** along horizontal row; add program or student learning **outcomes** in first column; indicate where each outcome is introduced (**I**), reinforced (**R**), and assessed (**A**).

Curriculum Map for: Moberly Area Community College

Be able to identify various materials used in machining and know their differences.		IR	R	RA
Demonstrate basic wiring methods on various mortars and circuits.				IRA
Demonstrate knowledge of various mechanical linkages.			IRA	RA
Recognize the uses of fluid power equipment and their limitations.		R		IRA
Read blueprints to determine part hole sizes and locations, scales, title blocks, part section features, and fastener sizes.	IRA			
Understand methods of quality inspection at different stages of manufacturing; document and communicate inspection	IRA			
Demonstrate an understanding of quality system elements, definition of quality, ISO 9000 standard, types of quality management systems, PDCA cycle, continuous improvement concepts, audits, and inspections.	IRA			
Make precision measurements using calipers, and micrometers.	IRA			

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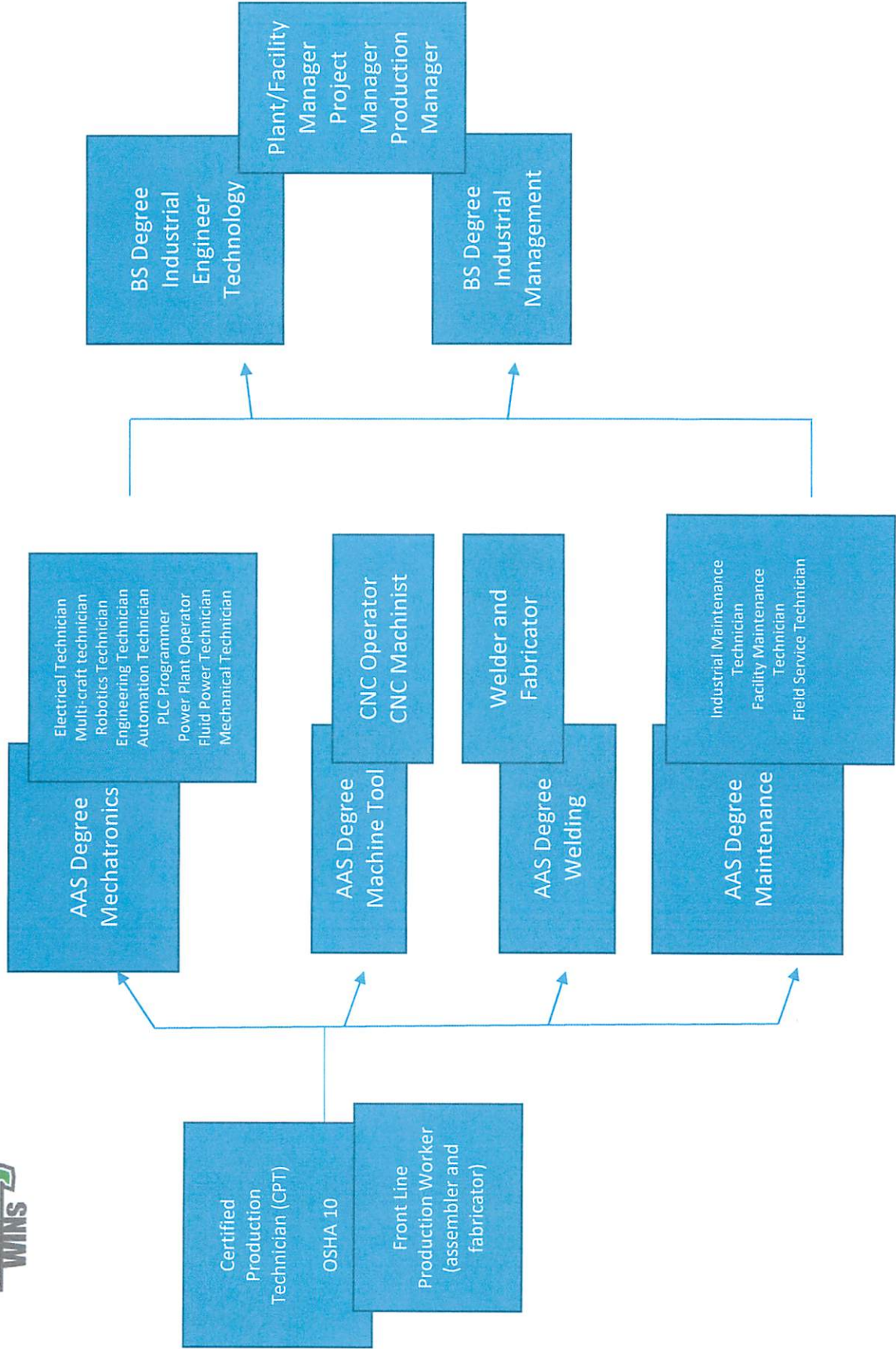


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# Certified Production Technician



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MACC Catalog #IND103

CIP #15.0612

DATE: January 2017

## Moberly Area Community College

### Common Syllabus

#### IND 103: Industrial Safety & Health – CPT Module 1 Current Term SP17

**Instructor:** Allan Sharrock

**Office number:** CC-31

**Office hours:** MW 8-11 & 1-3

**Contact information:** allans@macc.edu

**Classroom number:** CC-33

**Class days and time:** Monday 1<sup>st</sup> 8 Weeks. 10:00-11:55

**Catalog Description:** IND 103 Industrial Safety & Health

(3-0-3)

This industrial safety course includes safety organization, fire safety, materials handling, federal regulations, and current issues in industrial safety. The health portion includes overviews of industrial hygiene, air and noise monitoring, ventilation, and hazardous materials. Upon successful completion of this course, the student will be certified in OSHA safety along with Module 1 (Safety), with the nationally recognized Manufacturing Skill Standards Council (MSSC) Certified Production Technician (CPT) certificate. The student can receive the full Certified Production Technician (CPT) certificate upon successful completion of IND100, IND101, IND103, and AMD110.

***You must attend the first day in order to receive the OSHA card!***

**Prerequisite/Co-requisite:**

None

**Text(s):**

Online LMS furnished by Amatrol, Inc. and MSSC.

**Other Required Materials:**

None

**Equipment Provided:**

Student must have online access.

**Purpose of Course:**

Participants will learn the basics of industrial safety including organization, fire safety, material handling, and numerous federal regulations. Successful students will be OSHA 10 certified and eligible to take the MSSC CPT safety certification.

**Course Objectives:**

Upon completion of this course, participants should be able to demonstrate an understanding of industrial safety practices and regulations, along with a general knowledge of personal protective equipment, fire and electrical safety, and material handling safety. Additionally, students should be able to demonstrate an understanding of industrial production teams, training, and leadership.

**Course Content:**

1. OSHA 10 safety instruction and certification
2. Safety discussions & review of safety practices

**III. Online safety training (9 units total)**

- Unit 1: Production Teams
- Unit 2: Training & Leadership
- Unit 3: Safety Organization
- Unit 4: Personal Protective Equipment
- Unit 5: Fire and Electrical Safety
- Unit 6: Work Area Safety
- Unit 7: Hazardous Material Safety
- Unit 8: Tool and Machine Safety
- Unit 9: Material Handling Safety

**Connection with Career and Technical Education (CTE) Outcome Statement:**

In compliance with MACC's CTE outcomes, the student who successfully completes this course will be able to:

- Demonstrate effective written and oral communication



## **ASSESSMENT OF STUDENT LEARNING**

### **Grade Scale:**

A = 90-100%

B = 80-89%

C = 70-79%

D = 60-69%

F = 59% and below

The Mechatronics faculty continually strives to meet the needs of their students through program improvements. These improvements are a result of program assessments and the consultation and advisement of the Mechatronics Advisory Committee. In addition to the course assessments outlined in this syllabus, the objectives achieved in this course will also be an integral part of the Mechatronics program assessment. Students will be assessed on the mastery of course concepts and essential skills attained in this course.

### **Assessment:**

(340 points total):

160 points: Threaded Discussions (47%)

40 points Final (12%)

40 points: Safety Paper (12%)

100 points: Average of online quizzes (29%)

The instructor reserves the right to use/not use the curve grading system.

### **Description of Assignment(s)/Project(s)**

## INSTRUCTOR POLICIES

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### **Tardiness:**

All students are expected to be on time for class. Excessive tardiness will be dealt with on a one on one basis with the instructor.

### **Make-up and late work:**

Any late work that is accepted will have points deducted for tardiness. Due to the nature of labs and associated instrumentation and components, no labs will be allowed to be made up except as posted.

### **Extra-credit work:**

Extra credit may or may not be awarded.

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### **Use of Personal Communication Devices During Class:**

Due to the nature and complexity of the material being covered and its relation to labs, applied theory, and safety – the use of personal communication devices (i.e., smart phones, iPads, etc.) during class periods is strictly prohibited.

### **Schedule of Student Assignments/Activities:**

(Instructors will identify a Student Assignment/Activities schedule. Instructors have the prerogative to construct the schedule by class periods, weeks, or an overview of topics to be covered.)

## COLLEGE POLICIES

### **Attendance:**

Any student who misses two consecutive weeks of class during a regular sixteen-week semester or the equivalent proportion of class time during a shorter session will be dropped from the class by the instructor unless acceptable justification is supplied. Additionally, any student who misses more than one-fourth of the entire number of in-seat class meetings in a regular 16-week semester or the equivalent proportion of class time during a shorter session, may be dropped from that class by the instructor if, in the opinion of the instructor, the student does not have reasonable opportunity to succeed in the class. **A student's attendance rate will be calculated based upon the first day of the semester (not the student's date of enrollment in the course).**

Student attendance must be defined in a different manner for online, hybrid, and virtual courses. Student attendance in these courses is defined as active participation in the course. Online, hybrid, and virtual courses will, at a minimum, have weekly mechanisms for student participation, such as any or all of the following methods:

1. Completion of quizzes or exams
2. Submission of assignments
3. Participation in threaded discussions
4. Communication with the instructor

A student who does not participate in an online, hybrid, or virtual course for two consecutive weeks will be dropped by the instructor unless acceptable justification is supplied. **As with ground courses, a student's attendance rate in online courses will also be calculated based upon the first day of the semester. If a student does not demonstrate active participation in the online course within the first two weeks (or the equivalent proportion of class time during a short session), the student will be dropped as "never attended."** Simply logging into an online class does not constitute active participation.

**Students should be aware that their dropping a course and their last date of attendance in the course may impact their financial aid.**

#### **Academic Dishonesty:**

MACC board policy is as follows: "Academic dishonesty by students damages institutional credibility and unfairly jeopardizes honest students; therefore, it will not be tolerated in any form." Forms of academic dishonesty include but are not limited to the following: violations of copyright law, plagiarism, fabrication, cheating, collusion, and other academic misconduct. Incidents of dishonesty regarding assignments, examinations, classroom/laboratory activities, and/or the submission of misleading or false information to the College will be treated seriously. The procedure for handling academic dishonesty is outlined in the Student Handbook (*Policy Handbook M.010*). In cases of alleged academic dishonesty, the burden of proof is on the student, not on the instructor.

#### **ADA Statement:**

Students who have disabilities that qualify under the Americans with Disabilities Act may register for assistance through the Office of Access and ADA Services. Students are invited to contact the Access Office to confidentially discuss disability information, academic accommodations, appropriate documentation and procedures. For more information, please call either the Moberly office at (660) 263-4100 Ext. 11240 or the Columbia office at (573) 234-1067 Ext. 12120, or visit our web page at <http://www.macc.edu/index.php/services/access-office> ([Links to an external site.](#))[Links to an external site.](#)

#### **Title IX Statement:**

MACC maintains a strict policy prohibiting sexual misconduct in any form, including sexual harassment, sexual discrimination, and sexual violence. All MACC employees, including faculty members, are considered mandated reporters of sexual misconduct and as such are expected to contact the Title IX Coordinator when they become aware, in conversation or in writing, of an incident of sexual misconduct. For more information on this policy or to learn about support resources, please see <http://www.macc.edu/sexual-misconduct-policy> ([Links to an external site.](#))[Links to an external site.](#) or contact Dr. Jackie Fischer, MACC's Title IX Coordinator, at 660-263-4110, Ext. 11236 or [jackief@macc.edu](mailto:jackief@macc.edu).

## Course Summary:

Date	Details
Sun Jan 22, 2017	<u><a href="#">Discussion Week 1 Introductions</a></u>
Sun Jan 29, 2017	<u><a href="#">Discussion Week 2</a></u>
Sun Feb 5, 2017	<u><a href="#">Discussion Week 3</a></u>
Sun Feb 12, 2017	<u><a href="#">Discussion Week 4</a></u>
Sun Feb 19, 2017	<u><a href="#">Discussion Week 5</a></u>
Sun Feb 26, 2017	<u><a href="#">Discussion Week 6</a></u>
Sun Mar 5, 2017	<u><a href="#">Discussion Week 7</a></u>
Mon Mar 6, 2017	<u><a href="#">Safety/Business Research Paper</a></u>
Thu Mar 9, 2017	<u><a href="#">Final</a></u> <u><a href="#">Discussion Week 8</a></u>
Fri Mar 10, 2017	<u><a href="#">Final</a></u>  <u><a href="#">Grades</a></u>  <u><a href="#">MSSC Quizzes</a></u>  <u><a href="#">Roll Call Attendance</a></u>

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MACC Catalog #AMD110

CIP #15.13010

DATE: January 10, 2017

**Moberly Area Community College**

**Common Syllabus**

**AMD110 Industrial Print Reading – CPT Module 2**

**Spring 2017**

**Instructor:** Deanna Blickhan  
**Office number:** C32 - Main Campus  
**Office hours:** M & W 4 to 5 pm, T 2 to 6, R 3 to 6 pm, and F 4 to 5 or by appointment  
**Contact information:** deannab@[macc.edu](mailto:deannab@macc.edu) or (660) 263-4110 ext. 11225  
**Classroom number:** C29 - Main Campus - Career Center  
**Class days and time:** 1<sup>st</sup> 8 weeks Wednesday 10 to 12  
**Catalog Description:** AMD 110 Blueprint Reading (2-2-3)

This class focuses on the measurement of product and comparing results to specifications. You will learn about many of the tools used in the quality process including gages and data collection instruments. Learn how to communicate quality problems through a quality system and how to take some corrective actions when problems are found. The reading of specifications and blueprints will be taught as they apply to quality measurements. The goal is to prepare you for the MSSC Quality Assessment. (FA, SP)

**Prerequisite/Co-requisite:** None

**Text(s):** Online LMS furnished by Amatrol, Inc. and MSSC along with content located in the modules on Canvas.

**Other Required Materials:** None

**Equipment Provided:** Student must have online access.

**Purpose of Course:** Participants will learn how to read and use blueprints, diagrams, and symbols commonly found in the machine tool and industrial mechanical maintenance settings.

**Course Objectives:**

Upon successful completion of this course, students will be able to:

1. Reading multi-view drawings to visualize part shapes, identify features, and identify dimensions.
2. Reading drawings to determine part hole sizes and locations, scales, title blocks, part section features, and fastener sizes.
3. Interpretation of part dimension tolerances, geometric dimensioning and tolerancing (GD&T) symbols and frames, and datums.
4. Interpret English and S.I. measurements; perform system conversion; use tape measures and rules; accuracy and repeatability.
5. Making precision measurements using dial calipers, digital calipers, and micrometers.
6. Gauging parts using dial indicators, digital indicators, and data acquisition software; calibration of instruments; part mastering.
7. Quality system elements, definition of quality, ISO 9000 standard, types of quality management systems, PDCA cycle, continuous improvement concepts, audits, inspections.
8. Methods of process improvement, importance of data collection and analysis, types of statistical tools.
9. Concepts of statistical process control, calculate mean, range, construct and analyze histograms, determine and interpret Cpk.
10. Types and applications of control charts; construct and analyze an X bar and R chart.
11. Applications of root cause failure analysis; construct and analyze Pareto charts; use brainstorming and fishbone diagrams to solve production problems, apply corrective and preventive action.
12. Role of managers and production workers in quality, quality teams.
13. Methods of quality inspection at different stages of manufacturing; document and communicate inspection
14. Types of quality audits, Quality audit procedures, document quality audit results; develop an action plan and recommendation from a quality audit.
15. Types of nonconformities and methods of detection; perform a root cause failure analysis; decide when / how to take preventive and corrective action.
16. Perform an effectiveness check; document and report preventive and corrective actions

**Course Content:**

1. Blueprint Reading 1 (Multi-view Drawings)
2. Blueprint Reading 2 (Assembly Drawings and Fasteners)
3. Blueprint Reading 3 (GD&T)
4. Basic Measurement
5. Precision Measurement Tools
6. Dimensional Gauging
7. Quality Systems
8. Quality Improvement
9. Introduction to SPC
10. Control Charts
11. Continuous Improvement – 1
12. Continuous Improvement – 2

13. Inspections
14. Audits
15. Prevention and Correction
16. Documentation

**Connection with Career and Technical Education (CTE) Outcome Statement:**

In compliance with MACC's CTE outcomes, the student who successfully completes this course will be able to:

**Outcome III:**

Students will think critically while systematically assessing problems, identifying issues and implementing solutions.

- Students will think critically while systematically assessing problems, identifying issues and implementing solutions.
- Students will demonstrate skill mastery and will pursue lifelong learning in their field while adapting to changing industry standards and following evidence-based practices.

**Grade Scale:** A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F = 59 and below

Participation	8% of grade = 100 points
Exams and Quizzes	77% of grade = 1100 points
Activities Assigned	15% of grade = 194 points

**Description of Assignment(s)/Project(s):** All course content will be accessed through the Online LMS furnished by Amatrol, Inc. and MSSC, the Canvas LMS and through hands-on learning in the lab.

**Assessment:** Students are assessed on their active participation in the hands-on lab work and online training LMS. Role will be taken during each class session and student will receive the appropriate grade for participation in group assignments and projects as well as individual work.

**COLLEGE POLICIES:**

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hybrid, and virtual courses will, at a minimum, have weekly mechanisms for student participation, such as any or all of the following methods:

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3. Participation in threaded discussions
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## **INSTRUCTOR POLICIES**

**Participation:** To successfully complete this course, regular classroom attendance and participation are essential. Participation, based on daily verbal and written performance, can affect the grade, either positively or negatively up to 5 percentage points.



**Tardiness:** Any daily quizzes that occur during your absence or if you are tardy will not be able to be taken at a later date. Class will begin and end on time. Students are expected to arrive on time to the best of their ability. Students who must come in after attendance is taken are expected to enter quietly, not disrupt the class session. It is the student's responsibility to see the instructor immediately following the conclusion of class so that the reason for their tardiness can be explained and their attendance can be confirmed. It is also the responsibility of the student to find out what information he/she missed. Three tardies will count as one absence.

**Announcements:** Announcements will be posted in CANVAS on a regular basis. They will appear on your CANVAS dashboard when you log in and/or will be sent to you directly through your preferred method of notification from CANVAS. Please make certain to check them regularly.

**Make-up and late work:** Any daily quizzes that occur during your absence or if you are tardy will not be able to be taken at a later date. Late work must be handed in during the next class session.

**Extra-credit work:** One assignment from the text that was not assigned may be completed for extra credit and must be approved of by the instructor before starting the extra credit.

**Electronic Distractions:** Students who are texting or using their laptops during class (except for taking notes) are not participating in class. Not only will your participation grade be affected by this action, but you may distract other students. Students who continually engage in such behavior will be asked to leave and will be counted absent for the day.

**Netiquette Statement:** Netiquette is online etiquette. It is important that all participants in online/virtual course be aware of proper online behavior and respect each other.

- Use appropriate language for an educational environment:
- Use complete sentences
- Use proper spelling and grammar
- Avoid slang and uncommon abbreviations
- Do not use obscene or threatening language
- Be respectful of differences while engaging in online discussions.
- Be considerate of others
- Allow for misunderstandings
- Cite your sources

**Virtual Office Hours:** I will be available for virtual office Student Online Office link in the Course Home module. During the week (M-F) I will check the email and monitor the discussion board several times a day. If you have a concern and send me a message, you can expect a response within two days.

**Email:** In this course we will use CANVAS to send email for private messages. You can either check your messages in the CANVAS system or set your notifications to your preferred method of contact. Please check your messages regularly. When submitting messages, please do the following:

Put a subject in the subject box that describes the email content with the week/unit and message subject. For example: Unit 1, Assignment 3-5.

- Send email only through Canvas and not my personal email account.
- Do not send messages asking general information about the class, please post those in the QUESTION FORUM.
- Do not submit your assignments by message.

**Homework:** All homework assignments are from the Textbook and from handouts from the Instructor. No late homework assignments will be accepted. Homework is normally due at the beginning of the next class day.

**Computer Access:** If you do not have access to a computer off campus, there are many computer labs on campus you can use to participate in the course including the Learning Center and the Library. Most public libraries also have computers with internet access that you can use for free.

**Grading:** All assignments will be graded and grades posted within one week of submission.

**Quizzes:** There will be no quizzes in this course.

**Midterm Examinations:** There will be no midterm exam. You are responsible for your own proctor arrangements. Exams will only be sent to your proctor(s).

**Final Examination:** There will be a comprehensive final exam. Students have two options and both will be completed online either in the LMS furnished by Amatrol, Inc. and MSSC or in Canvas. You are responsible for your own proctor arrangements. Exams will only be sent to your proctor.

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**MoSTEMWINS**  
**Instructional Materials for IND103 Industrial Safety and Health**  
**CPT 1**

Please list your instructional materials and resources; i.e., readings, websites, ancillary materials and major laboratory tools and equipment. SMEs will be looking for evidence that the program/course is linked to current industry standards and certifications and is enhanced, as possible, with online or technology-enabled learning. (Please see STLCC example.)

**Readings**

Manage Ergonomics.pptx  
Fire Extinguishers.pptx  
Fire Extinguishers.pptx  
Manage Fire Extinguishers.pptx  
Forklifts.pptx  
Forklifts.pptx  
Manage Forklifts.pptx  
Hazard Communication.pptx  
Hazard Communication.pptx  
Manage Hazard Communication.pptx  
PPE.pptx  
PPE.pptx  
Manage PPE.pptx  
The Four Stages of Team Development.pptx  
The Four Stages of Team Development.pptx  
Manage The Four Stages of Team Development.pptx  
The 10 Effective Qualities of a Team Leader.pptx  
The 10 Effective Qualities of a Team Leader.pptx  
Manage The 10 Effective Qualities of a Team Leader.pptx  
Machine Guards.pptx  
Machine Guards.pptx  
Manage Machine Guards.pptx  
Vocabulary Terms Essentials of Communication and Conflict Resolution Principles.docx  
Vocabulary Terms Essentials of Communication and Conflict Resolution Principles.docx  
Manage Vocabulary Terms Essentials of Communication and Conflict Resolution Principles.docx  
What is Halon and How Does it Work.docx  
What is Halon and How Does it Work.docx  
Manage What is Halon and How Does it Work.docx  
Why immediate milestones are preferable to long.docx  
Why immediate milestones are preferable to long.docx

Manage Why immediate milestones are preferable to long.docx  
Why Bad Bosses Sabotage Their Teams.docx  
Why Bad Bosses Sabotage Their Teams.docx

### Other Instructional Materials

Week 1 Discussion- Introductions  
Week 2 Discussion- Triangle Shirtwaist Company  
Week 3 Discussion- Groundbreaking OSHA Developments in 2015 to Directly Impact 2016 -  
- and Beyond  
Week 4 Discussion- OSHA Cites USPS for Unsafe Forklift Operations  
Week 5 Discussion- Safety Video  
Week 6 Discussion- Mike Rowe on Safety  
Week 7 Discussion- Profits Should Not Come at the Cost of Workplace Safety  
Week 8 Discussion- Reflection

### Major Laboratory or Learning Activity Tools/Equipment

MSSC Website  
OSHA Website

*This program is partially funded by the MoSTEMWINS \$19.7 million grant from the U.S. Department of Labor, Employment and Training Administration (TAACCCT). 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.*

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## **CPT Module 2 – AMD110 Print Reading Instructional Materials**

Unit 1 Discussion - Blueprint Reading & Multiview Drawings

Unit 2 Discussion - Measurements & The Tools Used

Unit 3 Discussion Continuous Quality Improvement

Unit 1 Assignment - Multiview Drawing - Students will complete sketches of Multiview Drawings during lab.

Unit 2 Assignment - For this assignment students will utilize precision measurement tools to measure a part supplied by the instructor during lab.

Unit 3 Assignment 1 - SPC Lab Exercise

Unit 3 Assignment 2 – PDCA Lab Exercise.

MSSC Learning Modules

1. Blueprint Reading 1 (Multi-view Drawings)
2. Blueprint Reading 2 (Assembly Drawings and Fasteners)
3. Blueprint Reading 3 (GD&T)
4. Basic Measurement
5. Precision Measurement Tools
6. Dimensional Gauging
7. Quality Systems
8. Quality Improvement
9. Introduction to SPC
10. Control Charts
11. Continuous Improvement – 1
12. Continuous Improvement – 2
13. Inspections
14. Audits
15. Prevention and Correction
16. Documentation

## **Power Point Presentations Utilized in Class**

Unit 1 Multiview Drawings.pdf  
Unit 1 Dimensioning.pdf  
Detail and Assembly Drawings.pdf  
Fasteners.pdf  
Geometric Dimensioning and Tolerancing GDT.pdf  
Precision Measurement Equipment for Industry.pdf  
Quality Systems-1.pdf  
Blueprint Reading Welding.pdf

## **Items Available to students as additional information available in Canvas All videos are YouTube videos with links in Canvas**

Blue Print Reading - Intro and views Pt. 1 Video  
Blue Print Reading - Intro and views Pt. 2 Video  
Multiview Drawing - Video  
Line Types in Technical Drawings - Video  
Sectioning - Video  
Introduction to Dimensioning - Video  
Dimensioning Guidelines - Video  
Title Block Tutorial - Video  
Introduction to Tolerancing - Video  
Fasteners - Video  
Screw Thread Nomenclature - Video  
Fasteners 1 - Video  
Fasteners 2 - Video  
Fasteners 3 - Video  
Sectioning.ppt  
Line Types Used in an Orthographic Projection.pptx  
Convert Any Fraction to Decimal - Video  
How To Read A Machinist's Scale Video  
How To Read A Machinist's Scale Video  
How to Read Calipers - Video  
Measuring to the Nearest cm & mm - Video  
How to Read an Inch Ruler - Video  
Six Sigma - Video  
QC101 What is Quality? - Video  
QC101 Basic Quality Terms - Video

QC101 Quality Symbols - Video  
QC101 Measurements - Video  
QC101 Basic Charting - Video  
QC101 Variable Control Charts - Video  
QC101 Variable Control Chart Averages - Video  
QC101 Variable Control Chart Ranges - Video  
QC101 Pareto Charting - Video  
QC101 Process Flow Charts - Video  
QC101 Process Flow Charting Follow-Up - Video  
QC101 Histograms - Video  
QC101 Describing Data - Video  
QC101 Predicting Outcomes - Video  
QC101 Attribute Control Charts P & NP Charts - Video  
Continuous Improvement - Video  
Statistical Process Control – Video

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**MoSTEMWINS**  
**Instructional Materials for IND100 Intro to Manufacturing**  
**CPT 3**

Please list your instructional materials and resources; i.e., readings, websites, ancillary materials and major laboratory tools and equipment. SMEs will be looking for evidence that the program/course is linked to current industry standards and certifications and is enhanced, as possible, with online or technology-enabled learning. (Please see STLCC example.)

**Readings**

Band Saws.pptx  
Band Saws.pptx  
  Manage Band Saws.pptx  
Cams.pptx  
Cams.pptx  
  Manage Cams.pptx  
Design capacity.pptx  
Design capacity.pptx  
  Manage Design capacity.pptx  
Drill & Reamers-1.jpg  
Drill & Reamers-1.jpg  
  Manage Drill & Reamers-1.jpg  
Force Measurement.pptx  
Force Measurement.pptx  
  Manage Force Measurement.pptx  
Friction.pptx  
Friction.pptx  
  Manage Friction.pptx  
How wheels work.pptx  
How wheels work.pptx  
  Manage How wheels work.pptx  
Inclined Plane.pptx  
Inclined Plane.pptx  
  Manage Inclined Plane.pptx  
Layout of parts.pptx  
Layout of parts.pptx  
  Manage Layout of parts.pptx  
Lean Manufacturing.pptx  
Lean Manufacturing.pptx  
  Manage Lean Manufacturing.pptx  
Machine Tools.pptx  
Machine Tools.pptx  
  Manage Machine Tools.pptx



Machine Troubleshooting.pptx  
Machine Troubleshooting.pptx  
Manage Machine Troubleshooting.pptx  
Mechanical Advantage Questions.pptx  
Mechanical Advantage Questions.pptx  
Manage Mechanical Advantage Questions.pptx  
Pneumatic Tools.pptx  
Pneumatic Tools.pptx  
Manage Pneumatic Tools.pptx  
Relationship between Mass and Density.pptx  
Relationship between Mass and Density.pptx  
Manage Relationship between Mass and Density.pptx  
SOP M Troubleshooting Cutting tools.pptx  
SOP M Troubleshooting Cutting tools.pptx  
Manage SOP M Troubleshooting Cutting tools.pptx  
Torque.pptx  
Torque.pptx  
Manage Torque.pptx  
Production Planning and Workflow.pptx  
Production Planning and Workflow.pptx

## **Other Instructional Materials**

Couse Introduction-Discussion  
Week 1 Discussion-Special vs. Common Causation  
Week 2 Discussion- Reaping the Benefits of Cycle Counting  
Week 3 Discussion- Designing a Lean-Based Supply Chain Using Demand Pull  
Week 4 Discussion-Transformational Change vs. Continuous Improvement  
Week 5 Discussion- Preparing to Measure Process Work with a Time Study  
Week 6 Discussion- Beam Suntory: A volatile Japanese-US blend  
Week 7 Discussion-Field Trip Reflection  
Week 8 Discussion- Reflection

## **Major Laboratory or Learning Activity Tools/Equipment**

Amatrol Mechanical Equipment  
Labvolt Power training Unit.  
MSSC Website  
OSHA Website  
Bandsaw, Drill press, Grinder, and various hand tools

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**MoSTEMWINS**  
**Instructional Materials for IND101 Fundamentals of Industrial**  
**Maintenance**  
**CPT Module 4**

Please list your instructional materials and resources; i.e., readings, websites, ancillary materials and major laboratory tools and equipment. SMEs will be looking for evidence that the program/course is linked to current industry standards and certifications and is enhanced, as possible, with online or technology-enabled learning. (Please see STLCC example.)

**Readings**

Tricky Questions CPT 4

Published. Click to unpublish Tricky Questions CPT 4. Manage Tricky Questions CPT 4

5S Audit Checklist for maintenance.pptx

5S Audit Checklist for maintenance.pptx

Manage 5S Audit Checklist for maintenance.pptx

Bearings.pptx

Bearings.pptx

Manage Bearings.pptx

Belt Sheave -4.0.jpg

Belt Sheave -4.0.jpg

Manage Belt Sheave -4.0.jpg

Belt Sheave -4.jpg

Belt Sheave -4.jpg

Manage Belt Sheave -4.jpg

Belt Sheave -5.jpg

Belt Sheave -5.jpg

Manage Belt Sheave -5.jpg

Chains.pptx

Chains.pptx

Manage Chains.pptx

Coupling alignment standard.pptx

Coupling alignment standard.pptx

Manage Coupling alignment standard.pptx

Driven over Driver 1.jpg

Driven over Driver 1.jpg

Manage Driven over Driver 1.jpg

Driven over Driver 2.jpg

Driven over Driver 2.jpg

Manage Driven over Driver 2.jpg

Driven over Driver 3.jpg

Driven over Driver 3.jpg

Manage Driven over Driver 3.jpg  
Circuits.ppt  
Circuits.ppt  
Manage Circuits.ppt  
ELECT pier-wavo and pie-ear CHART.pptx  
ELECT pier-wavo and pie-ear CHART.pptx  
Manage ELECT pier-wavo and pie-ear CHART.pptx  
Filters.pptx  
Filters.pptx  
Manage Filters.pptx  
Flash Cards Logic Elements.pptx  
Flash Cards Logic Elements.pptx  
Manage Flash Cards Logic Elements.pptx  
Logic Elements.pptx  
Logic Elements.pptx  
Manage Logic Elements.pptx  
Machine Maintenance.pptx  
Machine Maintenance.pptx  
Manage Machine Maintenance.pptx  
Ohms laws Q.pptx  
Ohms laws Q.pptx  
Manage Ohms laws Q.pptx  
Ohms.jpg  
Ohms.jpg  
Manage Ohms.jpg  
OILS & GREASES.pptx  
OILS & GREASES.pptx  
Manage OILS & GREASES.pptx  
Pie Eir.jpg  
Pie Eir.jpg  
Manage Pie Eir.jpg  
Pier Wavo.jpg  
Pier Wavo.jpg  
Manage Pier Wavo.jpg  
PLC LOGIC.pptx  
PLC LOGIC.pptx  
Manage PLC LOGIC.pptx  
PLC.ppt  
PLC.ppt  
Manage PLC.ppt  
Pneumatics & Hydraulics.pptx  
Pneumatics & Hydraulics.pptx  
Manage Pneumatics & Hydraulics.pptx  
Pulleys systems.gif  
Pulleys systems.gif  
Manage Pulleys systems.gif

Shaft alignment-2.ppt  
Shaft alignment-2.ppt  
Manage Shaft alignment-2.ppt  
Welding Danger.png  
Welding Danger.png  
Manage Welding Danger.png  
resistor\_color\_codes - Copy.jpg  
resistor\_color\_codes - Copy.jpg  
Manage resistor\_color\_codes - Copy.jpg  
Welding NO! Must be 35Ft.jpg  
Welding NO! Must be 35Ft.jpg  
Manage Welding NO! Must be 35Ft.jpg  
Welding Safety in Welding.png  
Welding Safety in Welding.png  
Manage Welding Safety in Welding.png  
Welding.pptx  
Welding.pptx

### **Other Instructional Materials**

Week 1 Discussion- Introductions  
Week 2 Discussion- 5 Tips for Transitioning from a Maintenance Paper Trail to a CMMS  
Week 3 Discussion- Building a Better Maintenance Organization  
Week 4 Discussion- Four Principles TPM  
Week 5 Discussion- TPM improvements  
Week 6 Discussion- Operations: Maintenance Metrics that Matter  
Week 7 Discussion- Field Trip Reflection  
Week 8 Discussion- Course Reflection

### **Major Laboratory or Learning Activity Tools/Equipment**

Amatrol Mechanical Equipment  
Labvolt Power training Unit.  
MSSC Website  
OSHA Website  
Bandsaw, Drill press, Grinder, and various hand tools

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MACC Catalog #IND100

CIP #15.0612

DATE: January 2017

Moberly Area Community College

**Common Syllabus**

IND 100: Introduction to Manufacturing – CPT Module 3

Spring 2017

**Instructor:** Allan Sharrock

**Office number:** C31

**Office hours:** MW 9-3 Virtual or by Appointment

**Contact information:** allans@macc.edu

**Classroom number:** C33

**Class days and time:** 2<sup>nd</sup> 8 weeks M 10:00-11:55

**Catalog Description:** IND 100 Introduction to Manufacturing (3-0-3)

This course will introduce the student to the manufacturing industry including industrial safety, industrial terminology, material properties, material processes, workflow processes, supply chain management, design and engineering and quality management systems including the concepts of lean manufacturing. Students will also participate in job-shadowing experiences with local industries. Upon successful completion of this course, the student will be certified in Module 3, Manufacturing Processes and Production, with the nationally-recognized Manufacturing Skill Standards Council Certified Production Technician certificate. The student can receive the full Certified Production Technician (CPT) certificate upon successful completion of IND100, IND101, IND103 and AMD110

**Prerequisite/Co-requisite:**

None

**Text(s):**

Online LMS furnished by Amatrol, Inc. and MSSC.

**Other Required Materials:**

None

**Equipment Provided:**

Student must have online access.

**Purpose of Course:**

Participants will learn basic concepts and principles of industrial management and practices. The course is designed for use by technologists, engineers and managers..

**Course Objectives:**

Students will have a basic understanding of the manufacturing process and how mechanical principles are used in manufacturing..

**Course Content:**

- Unit 1: Mechanical Principles
- Unit 2: Mechanical Linkages
- Unit 3: Machining Processes
- Unit 4: Machine Tooling
- Unit 5: Machine Operations
- Unit 6: Equipment Procedures
- Unit 7: Production Planning and Workflow
- Unit 8: Production Controls

**Connection with Career and Technical Education (CTE) Outcome Statement:**

In compliance with MACC's CTE outcomes, the student who successfully completes this course will be able to:

- Students will apply principles of professionalism and safety standards when entering the workforce
- Students will demonstrate effective written and oral communication skills.
- Students will demonstrate an understanding of discipline-related math and scientific principles
- Students will think critically while systematically assessing problems, identifying issues and implementing solutions

## **ASSESSMENT OF STUDENT LEARNING**

### **Grade Scale:**

A = 90-100%

B = 80-89%

C = 70-79%

D = 60-69%

F = 59% and below

The Mechatronics faculty continually strives to meet the needs of their students through program improvements. These improvements are a result of program assessments and the consultation and advisement of the Mechatronics Advisory Committee. In addition to the course assessments outlined in this syllabus, the objectives achieved in this course will also be an integral part of the Mechatronics program assessment. Students will be assessed on the mastery of course concepts and essential skills attained in this course.

### **Assessment:**

(400 points total):

160 points: Threaded Discussions (40%)

100 points Final (25%)

40 points: Business Research Paper (10%)

100 points: Average of online quizzes (25%)

The instructor reserves the right to use/not use the curve grading system.

## **Description of Assignment(s)/Project(s)**

### **INSTRUCTOR POLICIES**

-

#### **Tardiness:**

All students are expected to be on time for class. Excessive tardiness will be dealt with on a one on one basis with the instructor.

#### **Make-up and late work:**

Any late work that is accepted will have points deducted for tardiness. Due to the nature of labs and associated instrumentation and components, no labs will be allowed to be made up except as posted.

#### **Extra-credit work:**

Extra credit may or may not be awarded.

-

#### **Use of Personal Communication Devices During Class:**

Due to the nature and complexity of the material being covered and its relation to labs, applied theory, and safety – the use of personal communication devices (i.e., smart phones, iPads, etc.) during class periods is strictly prohibited.

#### **Schedule of Student Assignments/Activities:**

(Instructors will identify a Student Assignment/Activities schedule. Instructors have the prerogative to construct the schedule by class periods, weeks, or an overview of topics to be covered.)



## COLLEGE POLICIES

### **Attendance:**

Any student who misses two consecutive weeks of class during a regular sixteen-week semester or the equivalent proportion of class time during a shorter session will be dropped from the class by the instructor unless acceptable justification is supplied. Additionally, any student who misses more than one-fourth of the entire number of in-seat class meetings in a regular 16-week semester or the equivalent proportion of class time during a shorter session, may be dropped from that class by the instructor if, in the opinion of the instructor, the student does not have reasonable opportunity to succeed in the class. **A student's attendance rate will be calculated based upon the first day of the semester (not the student's date of enrollment in the course).**

Student attendance must be defined in a different manner for online, hybrid, and virtual courses. Student attendance in these courses is defined as active participation in the course. Online, hybrid, and virtual courses will, at a minimum, have weekly mechanisms for student participation, such as any or all of the following methods:

1. Completion of quizzes or exams
2. Submission of assignments
3. Participation in threaded discussions
4. Communication with the instructor

A student who does not participate in an online, hybrid, or virtual course for two consecutive weeks will be dropped by the instructor unless acceptable justification is supplied. **As with ground courses, a student's attendance rate in online courses will also be calculated based upon the first day of the semester. If a student does not demonstrate active participation in the online course within the first week (or the equivalent proportion of class time during a short session), the student will be dropped as "never attended." Simply logging into an online class does not constitute active participation.**

**Students should be aware that their dropping a course and their last date of attendance in the course may impact their financial aid.**

### **Academic Dishonesty:**

MACC board policy is as follows: "Academic dishonesty by students damages institutional credibility and unfairly jeopardizes honest students; therefore, it will not be tolerated in any form." Forms of academic dishonesty include but are not limited to the following: violations of copyright law, plagiarism, fabrication, cheating, collusion, and other academic misconduct.

Incidents of dishonesty regarding assignments, examinations, classroom/laboratory activities, and/or the submission of misleading or false information to the College will be treated seriously. The procedure for handling academic dishonesty is outlined in the Student Handbook (*Policy Handbook M.010*). In cases of alleged academic dishonesty, the burden of proof is on the student, not on the instructor.

**ADA Statement:**

Students who have disabilities that qualify under the Americans with Disabilities Act may register for assistance through the Office of Access and ADA Services. Students are invited to contact the Access Office to confidentially discuss disability information, academic accommodations, appropriate documentation and procedures. For more information, please call either the Moberly office at (660) 263-4100 Ext. 11240 or the Columbia office at (573) 234-1067 Ext. 12120, or visit our web page at <http://www.macc.edu/index.php/services/access-office> ([Links to an external site.](#))[Links to an external site.](#).

**Title IX Statement:**

MACC maintains a strict policy prohibiting sexual misconduct in any form, including sexual harassment, sexual discrimination, and sexual violence. All MACC employees, including faculty members, are considered mandated reporters of sexual misconduct and as such are expected to contact the Title IX Coordinator when they become aware, in conversation or in writing, of an incident of sexual misconduct. For more information on this policy or to learn about support resources, please see <http://www.macc.edu/sexual-misconduct-policy> ([Links to an external site.](#))[Links to an external site.](#) or contact Dr. Jackie Fischer, MACC's Title IX Coordinator, at 660-263-4110, Ext. 11236 or [jackief@macc.edu](mailto:jackief@macc.edu).

Course Summary:

Date	Details
Sun Mar 19, 2017	<a href="#">Week 1 Discussion</a>
Sun Mar 26, 2017	<a href="#">Week 2 Discussion</a>
Sun Apr 2, 2017	<a href="#">Week 3 Discussion</a>
Sun Apr 9, 2017	<a href="#">Week 4 Discussion</a>

Date	Details
Sun Apr 16, 2017	<u><a href="#">Week 5 Discussion</a></u>
Sun Apr 23, 2017	<u><a href="#">Week 6 Discussion</a></u>
Sun Apr 30, 2017	<u><a href="#">Week 7 Discussion</a></u>
Sun May 7, 2017	<u><a href="#">Week 8 Discussion</a></u>
	<u><a href="#">Business Paper</a></u>
	<u><a href="#">MSSC Post Quizzes</a></u>
	<u><a href="#">Roll Call Attendance</a></u>

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Course Syllabus  
MACC Catalog #IND101  
CIP #15.0612  
DATE: January 2017

Moberly Area Community College

**Common Syllabus**

IND 101: Fundamental of Industrial Maintenance – CPT 4 module  
Spring 2017

**Instructor:** Allan Sharrock

**Office number:** C31

**Office hours:** MW 9-3 Virtual or by Appointment

**Contact information:** allans@macc.edu

**Classroom number:** C33

**Class days and time:** 2<sup>nd</sup> 8 weeks W 10:00-11:55

**Catalog Description:** IND 101 Fundamental of Industrial Maintenance (3-0-3)

This course provides a basic survey of industrial and preventive maintenance concepts and practices used by industrial maintenance mechanics in the installation, troubleshooting, and repair of mechanical systems and machines found in industry. Topics include mechanics' tools, practices, and safety; basic types; operating concepts and principles of mechanical equipment and systems-gears, bearings, seals, mechanical drive systems; and basic fluid power. Course includes selection and use of proper lubricants by application, mechanical troubleshooting, and methods of scheduling preventive maintenance. Upon successful completion of this course, the student will be certified in Module 4, Maintenance Awareness, with the nationally-recognized Manufacturing Skill Standards Council Certified Production Technician certificate. The student can receive the full Certified Production Technician (CPT) certificate upon successful completion of IND100, IND101, IND103 and AMD110. (FA)

**Prerequisite/Co-requisite:**

None

**Text(s):**

Online LMS furnished by Amatrol, Inc. and MSSC.

**Other Required Materials:**

None

**Equipment Provided:**

Student must have online access.

**Purpose of Course:**

Participants will learn basic concepts and principles of industrial management and practices. The course is designed for use by technologists, engineers and managers..

**Course Objectives:**

Students will have a basic understanding of the manufacturing process and how mechanical principles are used in manufacturing..

**Course Content:**

- Unit 1: Welding
- Unit 2: Basic Electrical Circuits
- Unit 3: Electrical Measurements
- Unit 4: Electrical Power
- Unit 5: Pneumatic Power Systems
- Unit 6: Hydraulic Power Systems
- Unit 7: Lubrication Concepts
- Unit 8: Bearings and Couplings
- Unit 9: Belt Drives
- Unit 10: Chain Drives
- Unit 11: Machine Control Concepts
- Unit 12: Machine Automation

### **Connection with Career and Technical Education (CTE) Outcome Statement:**

In compliance with MACC's CTE outcomes, the student who successfully completes this course will be able to:

- Students will apply principles of professionalism and safety standards when entering the workforce
- Students will demonstrate effective written and oral communication skills.
- Students will demonstrate an understanding of discipline-related math and scientific principles
- Students will think critically while systematically assessing problems, identifying issues and implementing solutions

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**Assessment:**

(400 points total):

160 points: Threaded Discussions (40%)

100 points Final (25%)

40 points: Business Research Paper (10%)

100 points: Average of online quizzes (25%)

The instructor reserves the right to use/not use the curve grading system.

**Description of Assignment(s)/Project(s)****INSTRUCTOR POLICIES**

-

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**Extra-credit work:**

Extra credit may or may not be awarded.

-

**Use of Personal Communication Devices During Class:**

Due to the nature and complexity of the material being covered and its relation to labs, applied theory, and safety – the use of personal communication devices (i.e., smart phones, iPads, etc.) during class periods is strictly prohibited.

### **Schedule of Student Assignments/Activities:**

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MACC maintains a strict policy prohibiting sexual misconduct in any form, including sexual harassment, sexual discrimination, and sexual violence. All MACC employees, including faculty members, are considered mandated reporters of sexual misconduct and as such are expected to contact the Title IX Coordinator when they become aware, in conversation or in writing, of an incident of sexual misconduct. For more information on this policy or to learn about support resources, please see <http://www.macc.edu/sexual-misconduct-policy> ([Links to an external site.](#)) ([Links to an external site.](#))[Links to an external site.](#) or contact Dr. Jackie Fischer, MACC’s Title IX Coordinator, at 660-263-4110, Ext. 11236 or [jackief@macc.edu](mailto:jackief@macc.edu).

## Course Summary:

<b>Date</b>	<b>Details</b>
Sun Mar 19, 2017	<u><a href="#">Discussion Week 1</a></u>
Sun Mar 26, 2017	<u><a href="#">Discussion Week 2</a></u>
Sun Apr 2, 2017	<u><a href="#">Discussion Week 3</a></u>
Sun Apr 9, 2017	<u><a href="#">Discussion Week 4</a></u>
Sun Apr 16, 2017	<u><a href="#">Discussion Week 5</a></u>
Sun Apr 23, 2017	<u><a href="#">Discussion Week 6</a></u>
Sun Apr 30, 2017	<u><a href="#">Discussion Week 7</a></u>
Sat May 6, 2017	<u><a href="#">Business Research</a></u>
Sun May 7, 2017	<u><a href="#">Discussion Week 8</a></u>
Wed May 10, 2017	<u><a href="#">MSSC Quizzes</a></u>
	<u><a href="#">Final</a></u>

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## MoSTEMWINS

### Overview Table of Course Components: Course Objectives, Module/Unit Objectives, Activities and Assessments

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Course Title: \_\_\_\_\_ IND 103- Safety \_\_\_(CPT 1)\_\_\_\_\_

COURSE OBJECTIVE	MODULE-/UNIT-LEVEL OBJECTIVE	LEARNING ACTIVITIES	ASSESSMENTS
Production Teams	<ul style="list-style-type: none"> <li>• Evaluate how a product design meet customer requirements.</li> <li>• Use engineering principles to improve a design.</li> <li>• Perform a Role on a team.</li> </ul>	<ul style="list-style-type: none"> <li>• Students will engage in a discussion to determine which product meets the requirements of the customer.</li> <li>• Students will develop an improvement on an existing product.</li> <li>• MSSC Pre-quiz</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>
Training and Leadership	<ul style="list-style-type: none"> <li>• Provide training to another employee</li> <li>• Set and review team goals.</li> <li>• Set and review team goals.</li> <li>• Make team member assignments.</li> <li>• Use good conflict resolution techniques.</li> </ul>	<ul style="list-style-type: none"> <li>• Students will engage in a discussion on the best method for conflict resolution.</li> <li>• MSSC Pre-quiz</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>
Safety Organization	<ul style="list-style-type: none"> <li>• Identify safety responsibilities of individuals and of the organization.</li> <li>• Report a unsafe act.</li> </ul>	<ul style="list-style-type: none"> <li>• Students will learn how to navigate the OSHA website for reporting accidents.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>

	<ul style="list-style-type: none"> <li>• Perform job safety analysis.</li> <li>• Respond to an emergency.</li> <li>• Identify and address improper workplace behaviors</li> </ul>	<ul style="list-style-type: none"> <li>• Students will determine how to best prevent an unsafe act.</li> <li>• Complete Pre-quiz</li> </ul>	
Protective Personal Equipment	<ul style="list-style-type: none"> <li>• Select the proper eye and face protection</li> <li>• Select the proper hearing protection.</li> <li>• Select the proper hand protection for the task.</li> <li>• Select the proper footwear for the job site.</li> <li>• Identify proper helmet and hard hat based upon the job performed.</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be presented various glasses and headgear and determine their safety rating.</li> <li>• Complete the pre-quiz</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>
Fire and Electrical Safety	<ul style="list-style-type: none"> <li>• Select and use a fire extinguisher based upon the fire type.</li> <li>• Perform a lockout tag out.</li> <li>• Understand basic first aid steps.</li> <li>• Use an eyewash station.</li> </ul>	<ul style="list-style-type: none"> <li>• Complete the pre-quiz.</li> <li>• Students will examine a fire extinguisher and determine its use.</li> <li>• Students lockout tag out a machine in the lab.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>
Work Area Safety	<ul style="list-style-type: none"> <li>• Analyze workplace safety</li> </ul>	<ul style="list-style-type: none"> <li>• Complete the pre-quiz.</li> <li>• Students examine various scenarios</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>

	<ul style="list-style-type: none"> <li>Analyze various workplace permits and their use.</li> </ul>	<p>and determine what permits are required for the area.</p>	
Hazardous Material Safety	<ul style="list-style-type: none"> <li>Classify a hazardous material.</li> <li>Interpret a hazardous material safety data sheet.</li> <li>Locate and interpret a material safety data sheet.</li> <li>Know how to ship, receive, and store hazardous material.</li> <li>Clean up a hazardous material spill.</li> </ul>	<ul style="list-style-type: none"> <li>Complete the pre-quiz.</li> <li>Students will determine the proper location to store materials.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Final Quiz</li> <li>Online Discussion</li> </ul>
Tool and Machine Safety	<ul style="list-style-type: none"> <li>Analyze machine operator safety</li> <li>Perform a pneumatic lockout tag out.</li> <li>Perform an electrical Lockout tag out</li> <li>Analyze tool safety</li> <li>Determine proper ladder use.</li> </ul>	<ul style="list-style-type: none"> <li>Complete the pre-quiz.</li> <li>Students will lockout an electrical machine.</li> <li>Students will explain and demonstrate the proper use for various tools.</li> <li>Students will identify the proper ladder for the job to be performed.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Final Quiz</li> <li>Online Discussion</li> <li>Students will conduct a lockout tagout.</li> </ul>

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## MoSTEMWINs

### Overview Table of Course Components: Course Objectives, Module/Unit Objectives, Activities and Assessments

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**Course Title:** \_\_\_\_\_ **AMD110 Industrial Print Reading: CPT2**

COURSE OBJECTIVE	MODULE-/UNIT-LEVEL OBJECTIVE	LEARNING ACTIVITIES	ASSESSMENTS
Blueprint Reading 1 (Multi-View Drawings)	<ul style="list-style-type: none"> <li>• Interpret Blueprint Drawings When Shown an Object</li> <li>• Identify Views on a Blueprint</li> <li>• Identify Line Types Given a Blueprint Drawing</li> <li>• Select the Front View of an Object</li> <li>• Identify all types of Dimensions of an Object by Reading a Print</li> </ul>	Complete the Multiview Drawing lab assignment MSSC Pre-Quiz MSSC learning module with Skill Reviews.	MSSC Final Quiz MSSC Certification Exam/Course Final Exam
Blueprint Reading 2 (Assembly Drawings and Fasteners)	<ul style="list-style-type: none"> <li>• Determine a Dimension of an Object Given an Undimensioned Scaled Drawing</li> <li>• Interpret the Information in a Blueprint Title Block</li> <li>• Identify the Size and Type of Fastener Given an Example</li> <li>• Interpret an Assembly Drawing</li> </ul>	Complete the Blueprint Reading & Multiview Drawings Discussion MSSC Pre-Quiz MSSC Learning module with Skill Reviews.	MSSC Final Quiz MSSC Certification Exam/Course Final Exam
Blueprint Reading 3 (Geometric Dimensioning and Tolerancing)	<ul style="list-style-type: none"> <li>• Determine If a Part Dimension Is within Tolerance Using Conventional Tolerancing</li> <li>• Calculate the Limits of a Dimension Given Its Tolerance</li> <li>• Determine the Type of Fit between Two Mating Parts</li> <li>• Identify Correct Baseline Dimensions</li> <li>• Identify the Correct Datum to Use as a Reference Point</li> <li>• Select a Feature Control Frame for a Part Drawing</li> </ul>	Complete the MSSC Pre-Quiz MSSC Learning module with Skill Reviews.	MSSC Final Quiz MSSC Certification Exam/Course Final Exam
Basic Measurement	<ul style="list-style-type: none"> <li>• Use a Metric Machinist's Rule to Measure an Outside Length of a Part</li> <li>• Use a Decimal Inch Machinist Rule to Measure a Length</li> <li>• Use a Rule Graduated in Common Fractions of an Inch to Measure a Length</li> <li>• Use a Tape Measure to Measure a Length</li> </ul>	Complete the Measurements & the Tools Used Discussion MSSC Pre-Quiz MSSC Learning module with Skill Reviews.	MSSC Final Quiz MSSC Certification Exam/Course Final Exam

	<ul style="list-style-type: none"> <li>Convert between US Customary Units and SI Metric Units</li> </ul>		
Precision Measurement Tools	<ul style="list-style-type: none"> <li>Calibrate a Dial Caliper</li> <li>Use a Caliper to Measure an Outside Length of a Part</li> <li>Use a Caliper to Measure an Inside Length of a Part</li> <li>Use a Digital Caliper to Measure an Outside Length of a Part</li> <li>Use a Digital Caliper to Measure an Inside Length of a Part</li> <li>Use an Outside Micrometer Graduated in English Units to Measure the Length of a Part</li> <li>Use an Outside Micrometer Graduated in Metric Units to Measure the Length of a Part</li> <li>Use a Micrometer to Measure the Outside Diameter of a Cylindrical Part</li> </ul>	<p>Complete the Using Precision Measuring Tools lab assignment  MSSC Pre-Quiz  MSSC Learning module with Skill Reviews</p>	<p>MSSC Final Quiz  MSSC Certification Exam/Course Final Exam</p>
Dimensional Gauging	<ul style="list-style-type: none"> <li>Master a Dial Indicator</li> <li>Measure a Dimension Using a Dial Indicator</li> <li>Collect and Display Data Using Data Acquisition Software</li> </ul>	<p>Complete the MSSC Activities - Dial Caliper Operation, Digital Caliper Operation, Micrometer Operation, Dial Indicator Operation, and 1-2-3 Gauge Block Inspection  MSSC Pre-Quiz  MSSC Learning module with Skill Reviews</p>	<p>MSSC Final Quiz  MSSC Certification Exam/Course Final Exam</p>
Quality Systems	<ul style="list-style-type: none"> <li>Perform an Operation According to a Sampling Plan</li> <li>Perform a Product Inspection</li> </ul>	<p>Complete the PDCA Data Collection and Analysis lab assignment  MSSC Pre-Quiz  MSSC Learning module with Skill Reviews</p>	<p>MSSC Final Quiz  MSSC Certification Exam/Course Final Exam</p>
Introduction to SPC (Statistical Process Control)	<ul style="list-style-type: none"> <li>Identify the Type of Variation Given a Cause</li> <li>Calculate the Mean of a Set of Data</li> <li>Calculate the Range of a Set of Data</li> </ul>	<p>Complete the PDCA lab assignment  MSSC Pre-Quiz  MSSC Learning module with Skill Reviews</p>	<p>MSSC Final Quiz  MSSC Certification Exam/Course Final Exam</p>
Control Charts	<ul style="list-style-type: none"> <li>Classify Types of Given Data</li> <li>Manually Record Process Data on an X-Bar and R Chart</li> <li>Manually Construct an X-Bar and R Chart</li> <li>Analyze an X-Bar and R Chart</li> </ul>	<p>MSSC Pre-Quiz  MSSC Learning module with Skill Reviews</p>	<p>MSSC Final Quiz  MSSC Certification Exam/Course Final Exam</p>
Continuous Improvement I	<ul style="list-style-type: none"> <li>Construct a C&amp;E Diagram Given a Set of Causes</li> <li>Create a Cause and Effect Diagram as Part of a Brainstorming Process</li> <li>Manually Construct a Pareto Diagram</li> <li>Determine How to Respond to a Quality Problem</li> </ul>	<p>Complete the Continuous Quality Improvement Discussion  MSSC Pre-Quiz  MSSC Learning module with Skill Reviews</p>	<p>MSSC Final Quiz  MSSC Certification Exam/Course Final Exam</p>

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**MoSTEMWINS**

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**Course Title:** \_\_\_\_\_ IND 100- Intro to Manufacturing \_CPT 3 \_\_\_\_\_

<b>COURSE OBJECTIVE</b>	<b>MODULE-/UNIT-LEVEL OBJECTIVE</b>	<b>LEARNING ACTIVITIES</b>	<b>ASSESSMENTS</b>
Mechanical Principles	<ul style="list-style-type: none"> <li>• Use a spring scale to measure weight and force.</li> <li>• Understand how to calculate torque</li> <li>• Measure the mechanical advantage of a lever.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to use a spring scale.</li> <li>• Pre-Quiz</li> <li>• Calculate torque and mechanical advantages.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> <li>• Final Exam</li> </ul>
Mechanical Linkages	<ul style="list-style-type: none"> <li>• Calculate the coefficient of friction</li> <li>• Measure the amount of force needed to move an object.</li> <li>• Demonstrate knowledge of inclined planes.</li> <li>• Describe the different types of linkages.</li> <li>• Describe the different types of cams.</li> <li>• Demonstrate a turnbuckle</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate rolling friction</li> <li>• Calculate and measure the mechanical advantage of a inclined plane.</li> <li>• Connect the different types of linkages.</li> <li>• Connect the different types of Cams.</li> <li>• Utilize a turnbuckle.</li> <li>• MSSC pre-quiz.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> <li>• Connect and operate a turnbuckle.</li> </ul>



<b>Machining Processes</b>	<ul style="list-style-type: none"> <li>• Demonstrate a understanding of stock sizes of metal.</li> <li>• Know how to use a bandsaw.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify machine tools</li> <li>• ID various stock sizes and shapes of metal.</li> <li>• Change a bandsaw blade.</li> <li>• MSSC pre-quiz.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> <li>• Students will show how to change the bandsaw blade.</li> </ul>
<b>Machine Tooling</b>	<ul style="list-style-type: none"> <li>• Understand how to layout a work piece using various tools.</li> <li>• Explain the safety and use of a drill press.</li> </ul>	<ul style="list-style-type: none"> <li>• Use punches, square, and hammer to layout a work piece.</li> <li>• Students will drill a hole using the proper drilling bit and lubricant.</li> <li>• MSSC pre-quiz.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>
<b>Machining Operations</b>	<ul style="list-style-type: none"> <li>• Describe and to select a drill and hole for reaming.</li> <li>• Describe how to countersink a hole.</li> <li>• Describe how to counterbore a hole.</li> <li>• Describe the function of tapping a hole.</li> </ul>	<ul style="list-style-type: none"> <li>• Students will tap a hole.</li> <li>• Students will countersink a hole.</li> <li>• MSSC pre-quiz.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>
<b>Equipment Procedures</b>	<ul style="list-style-type: none"> <li>• Describe the role of a machine operator</li> <li>• Describe how to operate a automatic machine.</li> <li>• Describe methods for material handling.</li> </ul>	<ul style="list-style-type: none"> <li>• Set up and operate a automated machine.</li> <li>• Respond to a machine malfunction.</li> <li>• Troubleshoot a machine operation.</li> <li>• MSSC pre-quiz.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>
<b>Production Planning and Workflow</b>	<ul style="list-style-type: none"> <li>• Understand production workflow</li> <li>• Define three measures of capacity.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyze a manufacturing process and determine how to improve.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>

	<ul style="list-style-type: none"> <li>• Describe Production Planning</li> <li>• Determine cost of a final product</li> <li>• Understand how productivity is determined.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyze bottleneck and determine how to reduce them.</li> <li>• Interpret a routing sheet.</li> <li>• Calculate the materials used in a product.</li> <li>• MSSC PreQuiz</li> </ul>	
Production Control	<ul style="list-style-type: none"> <li>• Describe how to interpret a master production schedule</li> <li>• Define Kanban and JIT principles.</li> <li>• Determine packing methods for shipping products.</li> </ul>	<ul style="list-style-type: none"> <li>• Interpret a work order</li> <li>• Students will learn how to requisition tools and materials</li> <li>• Interpret inbound and outbound shipping manifests.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>

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**Course Title:** \_\_\_\_\_ **IND 101 Fundamentals of Industrial Maintenance (CPT 4)**

<b>COURSE OBJECTIVE</b>	<b>MODULE-/UNIT-LEVEL OBJECTIVE</b>	<b>LEARNING ACTIVITIES</b>	<b>ASSESSMENTS</b>
Welding	<ul style="list-style-type: none"> <li>Define the various welding processes and their uses</li> <li>Describe how to transport and store fuel for welding.</li> </ul>	<ul style="list-style-type: none"> <li>Students practice various types of welding</li> <li>Students will show how to store tanks and how to operate a torch.</li> <li>MSSC Pre Quiz</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Final Quiz</li> <li>Students will cut a pipe in half.</li> <li>Students will weld a gap.</li> </ul>
Basic Electrical Circuit	<ul style="list-style-type: none"> <li>Describe the two types of currents.</li> <li>Describe the function of a circuit tester.</li> <li>Understand the function of an electrical Schematic</li> </ul>	<ul style="list-style-type: none"> <li>Students will test a circuit.</li> <li>MSSC PreQuiz</li> <li>Students will identify symbols on a schematic</li> <li>Connect and operate a buzzer, solenoid, motor, and resistor.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Final Quiz</li> </ul>
Electrical Measurement	<ul style="list-style-type: none"> <li>Describe the function and operations of multimeters.</li> <li>Understand the difference between single and parallel circuit.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Prequiz</li> <li>Students will use a multimeter.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Final Quiz</li> <li>Students will operator a mulimeter.</li> </ul>

	<ul style="list-style-type: none"> <li>Describe how to use as ohmmeter.</li> </ul>		
Electrical Power	<ul style="list-style-type: none"> <li>Understand a knowledge of Ohms law.</li> <li>Understand power and give their units of measurements.</li> <li>Understand the importance of circuit breakers.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Prequiz</li> <li>Calculate voltage, ohms, and Amps.</li> <li>Operate a circuit using a circuit breaker.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Final Quiz</li> <li>Online Discussion</li> </ul>
Pneumatic Power Systems	<ul style="list-style-type: none"> <li>Know how the power system of a pneumatic system works.</li> <li>Understand basic maintenance of the pneumatic system.</li> <li>Understand the limitations of a pneumatic systems.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Prequiz</li> <li>Drain a filter.</li> <li>Change a filter.</li> <li>Identify parts of the system.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Final Quiz</li> <li>Online Discussion</li> <li>Students will build a pneumatic system.</li> </ul>
Hydraulic Power Systems	<ul style="list-style-type: none"> <li>Know how the power system of a hydraulic system works.</li> <li>Understand basic maintenance of the hydraulic system.</li> <li>Understand the limitations of a Hydraulic systems</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Prequiz</li> <li>Change hoses on a hydraulic system.</li> <li>Build a hydraulic system based upon a diagram.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Final Quiz</li> <li>Online Discussion</li> </ul>
Lubrication Concepts	<ul style="list-style-type: none"> <li>Define Total Predictive Maintenance</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Prequiz</li> <li>Use a Viscometer.</li> <li>Pull a oil sample.</li> </ul>	<ul style="list-style-type: none"> <li>MSSC Final Quiz</li> <li>Online Discussion</li> </ul>

	<ul style="list-style-type: none"> <li>• Describe how to conduct an oil analysis</li> <li>• Describe what a viscometer is.</li> </ul>		
Bearings and Couplings	<ul style="list-style-type: none"> <li>• Students will be able to describe the uses and preventative maintenance of various bearings and couplings.</li> <li>• Students will be able to understand gear drive systems.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Prequiz</li> <li>• Students will install a bearing on a shaft.</li> <li>• Students will be able to calculate gear ratios.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> </ul>
Belt Drives	<ul style="list-style-type: none"> <li>• Describe how to calculate a pulley ratio</li> <li>• Describe how to properly tension a belt.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Prequiz</li> <li>• Students will install and properly tighten a belt.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> </ul>
Chain Drives	<ul style="list-style-type: none"> <li>• Students will learn how to install a chain.</li> <li>• Students will learn the differences in mechanical chains.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Prequiz</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> <li>• Online Discussion</li> </ul>
Machine Control Concepts	<ul style="list-style-type: none"> <li>• Students will describe the different logic functions.</li> <li>• Students will understand ladder diagrams.</li> <li>• Describe the function of a power diagram.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Prequiz</li> <li>• Students will operate a ladder diagram.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> </ul>
Machine Automation	<ul style="list-style-type: none"> <li>• Describe the function of a relay operation.</li> <li>• Describe the function of a seal in circuit.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Prequiz</li> <li>• Students will operate a rely switch.</li> <li>• Students will design a logic circuit.</li> </ul>	<ul style="list-style-type: none"> <li>• MSSC Final Quiz</li> </ul>

	<ul style="list-style-type: none"><li>• Students will understand what a logic circuit is and its use.</li></ul>		
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## **Statement of Programmatic Innovation**

Participants enrolled in the CPT will gain first hand experience of the basic concepts of safety, print reading, manufacturing and maintenance. MACC's CPT program was designed as a hybrid combining the Manufacturing Skill Standards Council (MSSC) online curriculum and hands on lab component. The Certified Production Technician is offered as both credit and a mobile non credit program at MACC, allowing the certification to be utilized throughout our 16 county service region. This in turn has allowed our degree seeking students to earn a nationally recognized certification and the ability to attain gainful employment during progress to the AAS completion.

Strategy 1: College administration and the mechatronics instructor have all attended presentations/conferences on CBE. By using the MSSC curriculum for the CPT, we have developed a CBE model that has the potential to be expanded to the mechatronics and other technical programs in the future. The MSSC curriculum breaks down all material for the CPT into competencies with an online curriculum developed around those competencies. Students move through the online curriculum at their own pace with frequent pre- and post-testing of the material. Our program has added a required once a week lab to the online curriculum so that students have exposure and practice with the physical skills needed to enhance the curriculum. In the future, we hope to offer these labs by offering several open lab periods per week with students signing up for the most convenient lab times. Skills would be demonstrated by instructors in small groups or one-on-one and then students would practice the skills and be checked off for competency by the instructor. This would allow more flexibility for students and would also allow students to move through at their own pace. In addition, we have expanded credit for prior learning in the program.

Strategy 2: As mentioned, the CPT is offered as credit and non credit at MACC. Development and delivery of the curriculum evolved over the last year. For our credit program, we have incorporated the nationally recognized certification in four existing courses housed in four Associate of Applied Science majors, which include Mechatronics, Maintenance, Machine Tool and Welding. MACC has created clear program maps to show students how CPT stacks in the four different majors. Courses are as follows:

1. Module 1 Safety – IND103 Industrial Safety and Health (3 credit hours)
2. Module 2 Quality Practices and Measurement – AMD110 Industrial Print Reading (3 credit hours)
3. Module 3 Manufacturing Processes and Production – IND100 Introduction to Manufacturing (3 credit hours)
4. Module 4 Maintenance Awareness – IND101 Fundamentals of Industrial Maintenance (3 credit hours)

A 48-64 hour lab component has been added to MSSC's online curriculum. Students complete one to two modules in an 8 week session, with hopes of completing all four modules and assessments in 16 weeks.

Our non credit delivery is geared for completion at 8 weeks, providing the participants 30 hands on hours in our mobile lab or off campus location, if available. If a non degree seeking student

pursues an AAS degree at a later date, the CPT will be articulated in the previously mentioned programs.

**Strategy 3:** Grant lead, Faculty and Dean of CTE work with local industry and WIBS to recruit participants and students to programs. Navigators and faculty offer advising and career counseling on a daily basis and assist participants in finding internships. Students who are currently enrolled and employed by local facilities have opportunities to gain internship experience within the company and continued efforts are placed with incumbent workers. Building and maintaining relationships with local industry continue to be a priority. The President, Dean and CTE personnel serve on boards for WIB, regional economic development groups in order to build current and future business relationships.