



College of the Redwoods

Manufacturing Technology & Welding Technology Advisory Committee

Tuesday, May 17th, 2022

6:00 p.m. – 7:20 p.m.

7351 Tompkins Hill Rd, Eureka CA 95501

AT-127

Meeting Minutes

Attendance:

- John Barber, O&M Industries Project Manager
- Chris Albright, O&M Industries Chief Operating Officer
- Logan Olson, Olson Manufacturing Owner
- Kyle Shamp, Eureka High School Teacher
- Dave Stevens, Eureka High School Teacher
- Brett Roslosnik, Fortuna High School Teacher
- Chris Verderber
- William Row, Strong Workforce Program K-12 Pathway Coordinator
- Kenny Ingalls, South Fork High School Manufacturing Instructor
- Mike Haley, College of the Redwoods Career Education Executive Dean
- Madisyn Harlan, Shasta/CR Assistant Director of Employment Partnerships
- Montel Vander Horck, College of the Redwoods Career Center Manager
- Will Madaras, College of the Redwoods Construction Instructional Support Staff
- Mindy Bacon, College of the Redwoods Instructor
- Ian Cossar, College of the Redwoods Welding Instructional Aide / Fab Lab Coordinator
- Jerry Goodrow, College of the Redwoods Instructor
- Melissa Barker, College of the Redwoods Fab Lab Coordinator
- Mike Peterson, College of the Redwoods Instructor
- Morgan Solem, College of the Redwoods Grants Manager
- Augusta Solem, College of the Redwoods Career Education Secretary

Welding Technology Updates

- Jerry Goodrow shared that he and Morgan Solem toured the Shasta College Welding and Manufacturing programs. This helped them evaluate what updates will be needed for CR's Welding (WT) program and how the Manufacturing (MT) program can be more integrated with the WT program.
- New curriculum for the Fab Lab will be approved in Spring of 2023.

Manufacturing Technology Updates

- Mike Peterson shared a document with the advisory committee (Appendix A, page 4) that shows how the MT classes and degrees will be changed.
- Mike Peterson plans to have the certificates and degrees require less units for MT. There will also be an adjustment to MT classes, many four-unit classes will be replaced with two-unit classes.

Discussion Topics

- i. **How is CR successfully responding to industry needs?**
 - Chris Albright stated that at Fortuna Iron, another company owned by O&M, many high school graduates and CR graduates work there since less complex welding jobs are completed there.
 - Chris Albright shared that the best students typically leave the area for higher paying welding jobs.
- ii. **What industry needs exist that CR is not addressing?**
 - Chris Albright and John Barber find that students come to work at O&M and do not have a realistic concept of what it takes to be a welder/fabricator.
 - John Barber mentioned that students lack soft skills such as showing up on time. They also don't know what the job will entail and they lack skills in math and blue print reading which are very important in welding and fabricating.
 - Chris Albright mentioned that blue print reading is a desired skill for industry.
 - Chris Albright also shared that millwright work and safety skills are very valuable. Logan Olson agreed, sharing that a basic understanding of how to be safe around heavy equipment is invaluable in a manufacturing shop.
- iii. **What is CR doing within the program that it should, or should not be doing?**
 - Chris Albright shared that he is excited to see that the WT and MT programs will be collaborating more.
 - John Barber shared that CR should not be certifying students on 3/8 inch plates, because for structural welding the industry standard is testing for unlimited thickness using 1 inch plates.
 - John Barber stated that gas welding is valuable for hobbies, but MIG welding replaced gas welding a long time ago. Brett shared that gas welding is a cost-effective way to teach TIG and it is helpful to know how to braze, however it is outdated.
 - Logan Olson mentioned that it would be beneficial to see teaching focused on modern industry standards.
 - Logan Olson shared that it would be helpful for students when they graduate or earn their certificate to and have some sort of portfolio, showing that they completed specific tasks that are relevant to current industry standards.
 - Mindy Bacon shared that job shadowing could be a great way to have students develop a realistic expectation for what the work entails.
 - Chris Albright shared that O&M would be happy to have tours and job shadows, however they struggle with figuring out a way to make internships due to the complexity of the fabricating work that is completed at O&M.

- Logan Olson shared that internships would be a struggle due to the highly complex work that is done at his company.

General Discussion

- Montel Vander Horck shared that the Career Center would be willing to help facilitate internships or apprenticeships with local industry to create a step program for students.
- Montel Vander Horck shared that it could be beneficial to do a MT/WT Careers Exploration Summer Institute at CR. A MT/WT exploration summer program could be held for students interested in the MT/WT field. This program would bring them to CR to explore MT/WT pathways. The program could include job shadowing, touring local industry sites, and hands-on work all which could give students a clearer picture of the job expectations.
- Meeting was adjourned at 7:20 p.m.

APPENDIX A

Manufacturing Technology Report for WT MT Advisory Committee Meeting May 17, 2022

The Manufacturing Technology program has completed the development of a new Certificate of Achievement entitled *Manufacturing Maintenance Technician (MMT)*. This certificate is intended to fulfill a well-documented community need. This new certificate is being deployed next semester.

Moving forward, the MT program proposes the following changes:

1. Deactivate all current MT degrees and certificates (not including the new MMT CA). This would eliminate the four legacy programmatic offerings: MT.AS, MT.CA, CADD/CAM.AS, and CADD/CAM.CA.
2. Create a new Associates Degree entitled *Advanced Manufacturing Technology* described below. This degree would align with program titles utilized by sister colleges across the state and will better represent the direction of the program. This proposal reduces the number of credits required to 25 units (down from 42 and 46 units) and reduces typical course units to mostly 2-unit courses (down from 3-4 unit courses). These curricular modifications are purposely designed to increase rates of student completion and reduce the complexity of scheduling by attempting to offer all necessary courses within one academic year, not relying upon a multi-year schedule as we have previously.
3. Following the development of a new AS in item 2 (above), create a new Certificate of Achievement (CA) entitled *Manufacturing Production Technician*, described below. This CA would be a subset of the AS and will round out the program offerings to include a stackable CA to AS.

New and Proposed Certificates and Degree

Manufacturing Maintenance Technician (New, Starting Fall 2022)

Catalog Description

The Manufacturing Maintenance Technician certificate prepares students for careers in the manufacturing industry that are essential for keeping manufacturing facilities productive. These careers involve the set-up, preventative maintenance, troubleshooting, and repair of a wide range of industrial machinery. Students will learn hands-on skills in fabrication, machining, and welding through project-based lessons. Theoretical content in mechanics, fluid power, electronics, robotics, programming, and precision measurement will be reinforced with laboratory interactions using state-of-the-art industrial machinery. Students will specialize by selecting elective courses that emphasize curriculum in a variety of technologies.

Program Goals

Create a flexible educational pathway aligned with Manufacturing Technology that allows students to gain skills and be employable in one year.

Provide local industry with a workforce that has specific skills tailored to niche manufacturing in Humboldt County.

Offer an award that addresses targeted industrial concepts so that students will rapidly become eligible for occupations such as Helpers-Installation, Maintenance & Repair Workers (49-9098.00), Maintenance and Repair Workers, General (49-9071.00), Industrial Machinery Mechanics (49-9041.00), Millwrights (49-9044.00), and Maintenance Workers, Machinery (49-9043.00).

Enhance our Manufacturing Technology Program to include additional areas of study such as Industrial Systems Technology and Maintenance (0945.00) and Industrial Mechanics and Maintenance Technology (47.0303).

Outcomes

After successfully completing this program, a student will be able to:

1. Set-up, maintain, troubleshoot, and repair a variety of industrial machines.
2. Demonstrate safe work habits using a wide range of tools, chemicals, and materials.
3. Perform process optimization using industrial concepts such as statistical process control, root cause analysis, and lean manufacturing.

New Certificate of Achievement

- *Manufacturing Maintenance Technician* - Two semesters: Total Units 22 - 24

Core Courses	Units	
▪ CET-10 Survey of Electronics	3	
▪ CT-25 OSHA Construction Safety	2	
▪ IT-60 Basic Blueprint Reading	3	New Course
▪ IT-70 Fundamentals of Industrial Maintenance	3	New Course
▪ MT-10 Fundamentals of Manufacturing Technology	3	
▪ WT-53 Basic Gas and Arc Welding	2	
Core Total		16

Electives: Choose 6 to 8 Units

▪ AT-10 Introduction to Automotive Technology	4
▪ CET-10L Survey of Electronics Lab	1
▪ CT-21A Survey of Wood Technology	3
▪ DT-23 Engineering Design Graphics	3
▪ IT-152 Technical Computer Applications Lab	1
▪ MT-13 Advanced Manufacturing Processes	4
▪ MT-54A Fundamentals of CNC Machining	4
▪ MT-59A Mastercam 2-D Programming	4
▪ MT-52 Introduction to Metallurgy and Material Science	3
▪ WT-80 Welding Fabrication	2

Manufacturing Maintenance Technician CA Recommended Course Sequencing			
Fall Semester	Units	Spring Semester	Units
IT-70 Fundamentals of Industrial Maintenance	3	CET-10 Survey of Electronics	3
CT-25 OSHA Construction Safety	2	IT-60 Basic Blueprint Reading	3
MT-10 Fundamentals of Manufacturing Technology	3	WT-53 Basic Gas and Arc Welding	2
Elective(s) At least	4	Elective(s) At least	4
Total	12	Total	12

Advanced Manufacturing Technology Associates Degree (Proposed)

A proposed new offering to replace all legacy MT degrees and certificates.

Catalog Description

The Advanced Manufacturing Associates Degree prepares students for a wide range of careers in the manufacturing industry. These careers involve mechanical design skills as well as an understanding of various manufacturing processes including programming, set-up, and operation of production manufacturing machinery. Students will learn hands-on skills in Computer Aided Drafting (CAD), Computer Aided Manufacturing (CAM), Computer Numerical Control (CNC) machining, and manual

machining through project-based lessons. Theoretical content in machining, programming, robotics, precision measurement, metallurgy, and material science will be reinforced with laboratory interactions using state-of-the-art industrial machinery.

Program Goals

Create streamlined educational pathways in the program. This associates degree is top level award in a proposed program that includes the newly created Manufacturing Maintenance Technician Certificate.

Provide local industry with a workforce that has specific skills tailored to niche manufacturing in Humboldt County.

Offer a degree that addresses advanced concepts in manufacturing so that students will become eligible for entry-level occupations related to Metal Workers and Plastic Workers (51-4000), specifically those classified under Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic (51-4030), Machinists (51-4041), and Tool and Die Makers (51-4111). This associates degree will be closely aligned with the MMT certificate; thus, many students will be able to stack this new AS with the MMT and be prepared for additional careers including Maintenance and Repair Workers, General (49-9071.00), Industrial Machinery Mechanics (49-9041.00), Millwrights (49-9044.00), and Maintenance Workers, Machinery (49-9043.00).

Outcomes

After successfully completing this program, a student will be able to:

1. Program, set up, and operate automated manufacturing equipment.
2. Demonstrate safe work habits using a wide range of tools and materials.
3. Convert raw materials into finished machine parts using a variety of manufacturing technologies.

Proposed New Associates Degree

- *Advanced Manufacturing Technology* – Four semesters: Total Units 25

<u>Core Courses (20 total units required)</u>	<u>Units (Lecture, Lab)</u>
▪ MT-30A Manual Machining 1	2 (1,1) New Course
▪ MT-30B Manual Machining 2	2 (1,1) New Course
▪ MT-31A CNC Machining 1	2 (1,1) New Course
▪ MT-31B CNC Machining 2	2 (1,1) New Course
▪ MT-32A CADD/CAM 1	2 (1,1) New Course
▪ MT-32B CADD/CAM 2	2 (1,1) New Course
▪ IT-60 Basic Blueprint Reading	3 (2,1)
▪ WT-53 Basic Gas and Arc Welding	2 (1,1)
▪ MT-52 Introduction to Metallurgy and Material Science	3 (2,1)
<u>Area A CR General Ed (3 units required)</u>	<u>Units (Lecture, Lab)</u>
▪ CET-10 Survey of Electronics	3 (2,1)

Electives (2 units required)	Units (Lecture, Lab)
▪ IT-70 Fundamentals of Industrial Maintenance	3 (2,1)
▪ CET-10L Survey of Electronics Lab	1 (0,1)
▪ DT-23 Engineering Design Graphics	3 (2,1)
▪ IT-152 Technical Computer Applications Lab	1 (0,1)
▪ WT-80 Welding Fabrication	2 (1,1)
▪ WT-81 Open Lab for Welding Fabrication	2 (0,2)

Advanced Manufacturing AS Recommended Course Sequencing (Program Requirements)			
Year 1			
Fall Semester	Units	Spring Semester	Units
MT-30A Manual Machining 1	2	MT-30B Manual Machining 2	2
MT-31A CNC Machining 1	2	MT-31B CNC Machining 2	2
MT-32A CADD/CAM 1	2	MT-32B CADD/CAM 2	2
		IT-60 Basic Blueprint Reading	3
Total	6	Total	9
Year 2			
Fall Semester	Units	Spring Semester	Units
CET-10 Survey of Electronics	3	MT-52 Intro Metallurgy and Materials	3
Electives	2	WT-53 Basic Gas and Arc Welding	2
Total	5	Total	5

Manufacturing Production Technician Certificate of Achievement (Proposed)

A proposed new certificate to create a stackable CA to AS offering.

Catalog Description

The Manufacturing Production Technician certificate prepares students for entry-level careers in the production of manufactured goods, from raw materials to finished products. These careers involve the operation of a wide range of industrial machinery. Students will learn hands-on skills in common manufacturing processes including CNC machining and welding. Theoretical content in programming and operating machine tools will be reinforced with laboratory interactions using state-of-the-art industrial machinery.

Program Goals

Create a one-year educational pathway aligned with Manufacturing Technology.

Provide local industry with entry-level employees that have specific skills tailored to niche manufacturing in Humboldt County.

Offer a certificate that addresses concepts in manufacturing so that students will rapidly become eligible for entry-level occupations related to Metal Workers and Plastic Workers (51-4000), specifically those classified under Machine Tool Cutting Setters, Operators, and Tenders, Metal and Plastic (51-4030), Machinists (51-4041), and Tool and Die Makers (51-4111). This certificate will be closely aligned with the proposed AS in Advanced Manufacturing and will have some overlap with the MMT certificate.

Outcomes

After successfully completing this program, a student will be able to:

1. Operate automated manufacturing equipment.
2. Demonstrate safe work habits in an industrial environment.

Proposed New Certificate of Achievement

- *Manufacturing Production Technician* – Two semesters: Total Units 14

<u>Core Courses (14 total units required)</u>	<u>Units (Lecture, Lab)</u>
▪ MT-30A Manual Machining 1	2 (1,1) New Course
▪ MT-30B Manual Machining 2	2 (1,1) New Course
▪ MT-31A CNC Machining 1	2 (1,1) New Course
▪ MT-31B CNC Machining 2	2 (1,1) New Course
▪ MT-32A CADD/CAM 1	2 (1,1) New Course
▪ MT-32B CADD/CAM 2	2 (1,1) New Course
▪ WT-53 Basic Gas and Arc Welding	2 (1,1)

Mfg. Production Technician CA Recommended Course Sequencing (Program Requirements)			
Fall Semester	Units	Spring Semester	Units
MT-30A Manual Machining 1	2	MT-30B Manual Machining 2	2
MT-31A CNC Machining 1	2	MT-31B CNC Machining 2	2
MT-32A CADD/CAM 1	2	MT-32B CADD/CAM 2	2
		WT-53 Basic Gas and Arc Welding	2
Total	6	Total	8

Course to All Program Awards Map

Course	Adv. Mfg. Associates	Mfg. Production Tech	Mfg. Maintenance Tech
AT-10 Into Auto Tech			Elective
CET-10 Surv Electronics	✓		✓
CET-10L Electronics Lab	Elective		Elective
CT-21A Surv Wood Tech			Elective
CT-25 OSHA Safety			✓
DT-23 Eng. Graphics	Elective		Elective
IT-60 Basic Blueprint	✓		✓
IT-70 Fund Maintenance	Elective		✓
IT-152 Computer Lab	Elective		Elective
MT-30A Manual Mach 1	✓	✓	✓
MT-30B Manual Mach 2	✓	✓	
MT-31A CNC Mach 1	✓	✓	Elective
MT-31B CNC Mach 2	✓	✓	
MT-32A CADD/CAM 1	✓	✓	Elective
MT-32B CADD/CAM 2	✓	✓	
MT-52 Metallurgy	✓		Elective
WT-53 Basic Welding	✓	✓	✓
WT-80 Weld Fabrication	Elective		Elective
WT-81 FABLAB	Elective		
CR General Education	✓		