



# Advanced Manufacturing Sector- Far North

*Educate, Train, & Connect the Manufacturing Workforce!*

## College of the Redwoods

### Manufacturing Technology Advisory Committee

#### Minutes

Thursday, January 24, 2019

6-7:30 PM

Eureka Main Campus Room AT133F (Machine Laboratory Computer Room)

#### 1. Welcome and Introductions

Committee members present:

Timothy Daniels	Kokatat Inc.
Kenny Ingalls	SFHS CTE Faculty
Todd Curry	MHS CTE Faculty
Lex Rohn	AHS CTE Faculty
Will Madaras	Humboldt County
Chia Hinchliff	College of the Redwoods
Cat Ory	College of the Redwoods
Molly Blakemore	College of the Redwoods
Marty Coelho	College of the Redwoods
Chris Albright	O&M Industries
Jack Sheppard	HCOE
Johanna Helzer	College of the Redwoods
Mike Peterson	College of the Redwoods
John Schmidt	Shasta College

#### 2. Discussion Items

##### a. Minutes from Last Meeting

- i. Reviewed and approved
- ii. Will provide previous meeting minutes prior to meeting for review for future advisories.
- iii. New advisory meeting organization announced; changes and improvements to communications are coming

- b. ATMAE Update
  - i. The program is currently preparing for a Spring 2019 accreditation team visit from ATMAE.
  - ii. ATMAE Accreditation Standard 7.2

Competency Identification & Validation: Measurable competencies shall be identified and validated for each program/option. These competencies must closely relate to the general outcomes established for the program/option and validation shall be accomplished through a combination of external experts, an industrial advisory committee and, after the program is in operation, follow up studies of program graduates.

- c. Manufacturing Day 10/5/2018 was highlighted
  - i. College of the Redwoods held a successful Open House on Manufacturing Day 10/5/2018 which showcased the programs lab and curriculum to students from Fortuna High School along with nearly 2 dozen others from the general public.
  - ii. Goal for 2019 is to have select local Shasta and Humboldt manufacturing companies' stage open house events (similar to other regions). Group expressed interest in playing a bigger role for the next Manufacturing Day (which will be Friday 10/4/2019 this year).
    - 1. John Schmidt and Mike Peterson will reach out to the committee in the Spring/Summer to solicit ideas and interested companies.
- d. Grants Update
  - i. Strong Workforce and CTEA Grant Updated (by Johanna/Mike)
  - ii. Advanced Manufacturing Sector Spring 2019 Supplies/Equipment grant announced
    - 1. This grant is to assist colleges with supplies or equipment purchases for existing or in-development Industrial Maintenance, Automation, and Mechatronics programs. The grant requires a one-to-one match, but SWP can be used to match. College of the Redwoods has submitted a grant request, pending selection in mid-February.
- e. Industry and Employment Trends Reviewed
  - i. The overall economy remains strong with unemployment running at near historic lows for Humboldt County (and lower vs the state and national rates)
  - ii. Manufacturing total labor has shown a year-over-year improvement of 4.8%
  - iii. Discussion from committee on importance of understanding the economic and labor data at a more local/regional/sector level (i.e. breakdown unemployment rate for manufacturing in Humboldt County).
    - 1. John Schmidt to follow up with Center of Excellence for data/reporting/analysis assistance

- f. Program Review- Presented by Mike Peterson
  - i. Non-substantial Change Required

<b>Associate of Science Degree, Manufacturing Technology</b>	
	Units
<b>General Education Requirements</b>	<b>18.0</b>
<b>Program Requirements</b>	
<b>Core Courses</b>	<b>43.0</b>
CET 10* Survey of Electronics	3.0
IT 60A Basic Manufacturing Blueprint Reading	3.0
IT 60B Machine Parts Blueprint Reading	3.0
MT 10 Fundamentals of Manufacturing Technology	3.0
MT 11 Advanced Manufacturing Turning	4.0
MT 12 Advanced Manufacturing Milling	4.0
MT 13 Advanced Manufacturing Processes	4.0
MT 52 Ferrous Metallurgy	3.0
MT 54A Intro to Computer Numerical Control	4.0
MT 54B Computer Numerical Control Machining	4.0
MT 59A Mastercam 2D Programming	4.0
MT 59B Mastercam 3D Programming	4.0
<b>Restricted Electives</b>	<b>3.0</b>
<i>(Choose 3 units from the list below)</i>	
DHET 167 Hydraulics and Pneumatics	3.0
DT 23 Engineering Design Graphics	3.0
or ENGR 23 Engineering Design Graphics	3.0
IT 25 Occupational Safety & Health Management	3.0
IT 46** Computers in Industrial Management	3.0
MT 54L Computer Numerical Control Lab	2.0
WT 53 Basic Gas and Arc Welding	2.0
<b>Unrestricted Electives - as needed to complete 60 units total</b>	
<b>Total Units</b>	<b>61.0</b>
<small>*Course can be double counted toward General Education.</small>	
<small>**Course inactivated. Please see department for appropriate substitution.</small>	

From the Nonsubstantial Change Documentation

If the associate degree program goal selected is “Career Technical Education (CTE)” or “Career Technical Education (CTE) and Transfer,” then the set of requirements must reflect the thinking of the advisory committee, as indicated in advisory committee minutes that are submitted as part of the proposal. If the CTE program requirements do not reflect the advisory committee’s recommendation, then the college must explain its departure from those recommendations.

- g. Program Plans from the 2018-2019 Program Review Report- Presented by Mike Peterson
  - i. Continue to work toward increasing enrollment by improving marketing materials, visiting local high school technology classes, hosting high school field trips, participating in community outreach events such as Science Night and other open house events.
    - 1. Marketing and outreach materials and supplies.
  - ii. Improve the MT and CET laboratories.
    - 1. Hire a full-time ISS 3. This is a replacement position.

2. Replace one manual vertical milling machine. The ATMAE accrediting agency identified a need to replace old equipment. Four well-worn milling machines will need to be replaced. This request is part of a strategy to replace all worn and obsolete machinery over a period of several years.
  3. Modernize and update electrical infrastructure in the MT laboratory AT133.
  4. Replace five manual engine lathes. The ATMAE accrediting agency identified a need to replace old equipment. The MT laboratory has many well-worn engine lathes that will need to be replaced. This request is part of a strategy to replace all worn and obsolete machinery over a period of several years.
  5. Purchase laboratory equipment relative to the North Far North Advanced Manufacturing Network Initiative. This includes manufacturing and machining equipment, electronics laboratory instruments and equipment, and mechanical training systems. The requested amount has been funded by a regional Strong Workforce grant project.
- iii. Develop one-year options that train students skills in electromechanical sciences.
  - iv. Participate in professional development related to ATMAE accreditation and program improvement.
    1. Travel to relevant professional development training.
- h. Manufacturing Technology Program MT Certificate and Degree Program Learning Outcomes (PLOs)- Presented by Mike Peterson
- i. Set up and operate manual machine tools including milling machines, lathes, precision grinders, Electrical Discharge Machines, and support equipment including drill presses, grinders, and saws.
  - ii. Set up and operate Computer Aided Manufacturing systems and Computer Numerical Control machine tools, including machining centers, turning centers, and rapid prototyping machines.
  - iii. Produce machine parts from engineering drawings within dimensional tolerances.
  - iv. Determine the best way to manufacture a given part, and produce it utilizing the available tools and equipment.
- i. Manufacturing Technology Program Student Learning Outcomes (SLOs) by Course Number- Presented by Mike Peterson

#### **MT-10 Fundamentals of Manufacturing Technology**

1. Set up and operate industrial machine tools using correct feed and speed calculations.
2. Use precision metrology instruments to accurately measure machine parts.
3. Research and report on current topics in manufacturing technology.

#### **MT-11 Advanced Manufacturing Technology - Turning**

1. Set up and operate manual lathes and grinding machines to accurately produce precision machine parts.
2. Perform the calculations required for producing various screw thread forms on an engine lathe.

3. Determine the appropriate use of the surface grinder with accuracy based on project parameters.

### **MT-12 Advanced Manufacturing Technology - Milling**

1. Set up and operate manual vertical and horizontal milling machines to accurately produce precision machine parts.
2. Perform the calculations required for industrial indexing systems.
3. Describe gear nomenclature and gear production techniques.

### **MT-13 Advanced Manufacturing Processes**

1. Program, set up, and operate multi-axis machine tools and CNC lathes using standard industry practices.
2. Program, set up, and operate industrial robotic systems.
3. Program, set up, and operate additive manufacturing systems and industrial lasers.

### **MT-42 Cooperative Education Work Experience in Manufacturing Technology**

1. Successfully complete three objectives that are site specific and related to career goals or degree / certificate requirements.
2. Demonstrate job retention skills identified as critical to the employer or supervisor.

### **MT-52 Introduction to Metallurgy and Material Science**

1. Explain the terms and processes of ferrous and nonferrous metals as well as the use of other materials of modern industry.
2. Set up, run, and document tensile strength tests, the Metcalf's experiment, and microscopic examination of polished, etched metal specimens.

### **MT-54A Introduction to Computer Numerical Control**

1. Program, set up, and operate CNC machine tools to perform basic machining operations.
2. Research and report on current topics in the manufacturing industry.

### **MT-54B Computer Numerical Control Machining**

1. Program, set-up, and operate CNC machine tools to perform complex machining operations.
2. Research and report on current topics in CNC machining.

### **MT-54L Numerical Control Lab**

1. Program, set-up, and operate automatic systems to perform complex functions.

### **MT-59A Mastercam 2-D Programming**

1. Create Mastercam solid model computer files that represent manufactured objects, display machining simulations, and produce CNC machine tool code.
2. Interpret basic technical drawings and instructions.
3. Research and report on current topics regarding CAM systems and CNC machining.

### **MT-59B Mastercam 3-D Programming**

1. Create Mastercam programs, incorporating wireframe, surface, and solid models for multi-axis machining.
2. Plan machining operations, select tooling, set parameters, and produce machine parts, utilizing computers and CNC machine tools.

### **IT-60A Basic Manufacturing Print Reading**

1. Interpret basic engineering drawings used in the manufacturing industry.
2. Create orthographic, isometric, and oblique sketches from given information.
3. Read and understand industrial welding prints.

### **IT-60B Machine Parts Print Reading**

1. Interpret the terminology and nomenclature used on advanced industrial prints.
2. Visualize three-dimensional objects from complicated engineering drawings and solid models.
3. Understanding of the Geometric Dimensioning and Tolerancing system as used on advanced engineering drawings.

### **CET-10 Survey of Electronics**

1. Describe the operation of electrical and electronic devices, circuits, and systems.
2. Analyze circuits and compute electrical and electronic variables.
3. Explain the influence of electricity and electronics on world history and cultures.

### **CET-10L Survey of Electronics Lab**

1. Interpret electrical and electronic circuit diagrams.
2. Design, build, and test electrical and electronic circuits.

- j. Reviewed Committee Recommendations for Program (from May Advisory)
  - i. Need more industry relationships for a stronger committee and student opportunities
    - 1. To be addressed through face-to-face industry site visits (see work plan below)
  - ii. Pursue dual and concurrent enrollment with high schools
    - 1. General discussion; more research needed
    - 2. One idea is to support NIMS certification at high school and college
      - a. Action to look into to having Mike Peterson obtain certification to help facilitate
  - iii. Integrate Fusion 360 into Cam courses
    - 1. Mike P has trained on this software; more research needed
  - iv. Create more marketing
    - 1. Incorporated in program work plan (see below)
- k. Reviewed and Discussed Program Work Plan and Curriculum Update
  - i. In late 2018, the AM DSN and the CoR Manufacturing Technology team met to review the current MT program, and develop a work plan for 2019 based on current program status, industry needs and trends, the advisory committee recommendations, and in alignment with the statewide AMS strategic goals.
  - ii. Work Plan Program Highlights for 2019
    - 1. CoR MT program is very comprehensive and robust
    - 2. But the manufacturing landscape has changed since the 1990's
    - 3. Design smaller certifications which can be completed in a year (i.e. CNC Operator and Maintenance Mechanic)
    - 4. Invigorate marketing to highlight the new offerings
    - 5. Re-assess list of local manufacturers including non-traditional manufacturers such as food processing, agriculture, small-batch, etc. and engage in face-to-face engagements to understand industry needs and communicate college capabilities (thru the Spring and Summer)
    - 6. Increase high school outreach including developing high school panels with parent involvement (similar to Jim River example)
- l. Announcements
  - i. Spring 2019 Internship Program
    - 1. This grant is to assist local manufacturers with hiring manufacturing technology students from their local community colleges during the Spring 2019 term with the opportunity of re-couping half of their cost (up to \$1,500)- see attached flyer.