Fullerton College

Manufacturing Technology

Machine-Metrology-Automated Technology Advisory Committee

Agenda

Fullerton College Manufacturing/Machine/Metrology/Automated Technology

321 E. Chapman Ave.

Fullerton, CA 92832

Friday May 5th, 2023, 3:00pm to 4:30pm

Room 728 in 700 building

- **Welcome and Introductions**: Dan O'Brien, Department Coordinator
- **Department Update:** Dan O'Brien/ George Bonnand, Faculty
- **Apprenticeship Program**
- **New and On-Going Department Grants**
- **New Curriculum/Courses/Certificates**
- **New Potential Curriculum**
- **New Equipment/Software**
- **Future Staffing and Space Requirements**
- **Donations**
- **Student Recruitment and Conference Activities**
- **Round Table Discussion**
- **Department Motions**
- **Committee Members**

Proposed Discussion Items

Department Update: (Note: Items will be discussed at varying levels of detail)

Apprenticeship Programs:
- Number of cohorts currently enrolled -we have 1 cohort of 2 students at this time.
- New Machinist Cohorts from CTMAA (California Tooling Machining Apprenticeships Association)-We have one cohort (2 individuals from Keysight Inc.) of apprentices starting this Fall 2021. We have one cohort (1 student from Keysight) starting in Fall 2022.

New and On-Going Department Grants:

- Strong Workforce Initiative Funding for Precision Machining and Metrology. No new funding has been requested this past year however funding may be requested for 2024-2025 academic year.
- VTEA Funding-No new funding has been requested this past year however funding may be requested for 2024-2025 academic year.

New Curriculum/Courses/Certificates -Review of Courses and Programs (Unit Revision, Descriptions, SLOs, Objectives, Course Content/Outlines, Textbook, etc.):

- Machine Technology Level I is State approved as of Fall 2018
- Machine Technology Level II is State approved as of Fall 2019
- Manufacturing Technology A.S. degree is State approved as of Fall 2019
- Mastercam Certificate is approved as of Fall 2018-Revised 2022 to include MACH 157 F
- Surfcam Certificate is approved as of Fall 2018-In process of being revised
- CNC certificate is State approved as of Fall 2019
- CNC Operator Certificate-revised certificate is State approved as of February 2021
- Conversational Programming Certificate is State approval as of October 2021
- Mini-Metrology Certificate is State approved as of February 2021.
- Metrology Certificate is State approved as of April, 2019
- Swiss Lathe Certificate is State approved as of April 2019
- Electro-Mechanical Technician Certificate-is State approved as of Fall 2021
- Automation Fundamentals Certificate-is State approved as of Fall 2022
- Industrial Maintenance Certificate-is State approved as of April 2019
- Engineering Technology Certificate-is State approved as of October 2021
- Industrial Technology AS-is State approved as of April 2019 and currently under revision
- Theme Park Technology Specialist is State approved as of July 2020
- Fusion 360 course-Mach 157 F has been approved but not offered as of yet.
- All Machine/Metrology Technology courses are now completely revised as Level-100 or higher and are State approved. See Table 1 and 2
- All courses have been reviewed to determine whether courses can be taught online/hybrid or not. Most courses can be taught Hybrid with only a few that can be taught totally on-line. Some courses in the Machine Technology and Technology departments simply cannot be taught in a hybrid or on-line fashion. Courses in the Machine, Metallurgy, and Technology are encouraged to be taught in person. As of Spring 2023 most course have returned to normal in person classes.
- Review of Courses and Programs for Descriptions, Objectives, Student Learning Outcomes (SLOs), Textbooks, Course Content, Methods of instruction, Methods of evaluation, etc. for all courses/programs per handout material. See Table 1, 2, 3, and 4.

Table 1-Machine/Metrology Technology related courses (** in front of the course name indicates courses have been reviewed/revised for online/hybrid instruction and/or other changes as deemed necessary by faculty.)

**MACH 101 F Introduction to Machine Tools *Active*	**MACH 110 F CNC Machine Set-Up and Operation *Active*	**MACH 142 F Advanced CNC Swiss Style Lathe Set-up and Operation *Active*	**MACH 157 F Computer-Aided Manufacturing *Active*
**MACH 102 F Intermediate Machine Tools *Active*	**MACH 115 F CNC Parts Programming *Active*	**MACH 145 F Basic CNC Swiss Style Lathe Programming and Applications *Active*	**MACH 180 F Introduction to Metrology *Active*
**MACH 103 F Advanced Machine Tools *Active*	**MACH 116 F Machine Tools *Active*	**MACH 150 F CNC Programming Using Mastercam *Active*	**MACH 182 F Introduction to CMM Inspection and Romer Arms *Active*
**MACH 104 F Advanced Topics in Machine Technology *Active*	**MACH 120 F Advanced CNC Machining *Active*	**MACH 151 F Mastercam Lathe "Pending State approval"	**MACH 184 F Advanced CMM and Romer Arm Inspection *Active*
**MACH 105 F Conversational Programming I *Active*	**MACH 130 F Multiple Axis CNC Set and Operation *Active*	**MACH 152 F Advanced CNC Programming Using Mastercam *Active*	**MACH 185 F CMM and Romer Arm Applications *Active*
**MACH 106 F Conversational Programming II *Active*	**MACH 140 F Basic CNC Swiss Style Lathe Set-up and Operation *Active*	**MACH 154 F CNC Programming Using Surfcam *Active*	**METL 192 F Metallurgy *Active*
		**MACH 156 F Advanced CNC Programming Using Surfcam *Active*	

Table 2-Technology Related Courses (** in front of the course name indicates courses are to be revised for online/hybrid instruction and/or other changes as deemed necessary by faculty.)

**TECH 081 F Technical Mathematics I *Active*	**TECH 108 F Manufacturing Processes *Active*	**TECH 135 F Introduction to Programmable Logic Controllers *Active*	**TECH 199 F Technology and Engineering Independent Study I *Active*
**TECH 082 F Technical Mathematics II *Active*	**TECH 127 F Industrial Safety *Active*	**TECH 136 F Computer Integrated Manufacturing and Advanced PLC *Active*	
**TECH 088 F Technical Science *Active*	**TECH 131 F Basic Electricity and Basic Electronics *Active*	**TECH 137 F Electronic Instrumentation and Networking *Active*	
**TECH 101 F Introduction to Technology *Pending*	**TECH 132 F Basics of Electric Motor Controls *Active*	**TECH 138 F Electronic Instrumentation and Networking II *Active*	

Table 3-Machine Technology Related Programs (** in front of the Program name indicates program may be revised for Unit revision, Description, Student Learning Outcomes (SLO) and/or other changes as deemed necessary by faculty.)

CNC Operator Certificate	Conversational Programming Skills Certificate	Manufacturing Technology AS Degree	Metrology Mini Skills Certificate
Computer Aided Manufacturing (CAM)*	Machine Technology Level I Certificate	Mastercam Certificate* and New Mastercam Certificate for Multi-Axis	Surfcam Skill Certificate
Computer Numerical Control (CNC) Certificate	Machine Technology Level II Certificate	Metrology Certificate	Swiss Lathe Certificate

Table 4-Technology Related Programs (** in front of the Program name indicates program may be revised for Unit revision, Description, Student Learning Outcomes (SLO) and/or other changes as deemed necessary by faculty.)

Automation Fundamentals Certificate	Industrial Maintenance Technician Certificate	Theme Park Technology Specialist Certificate
Electro-Mechanical Technician Certificate	Industrial Technology AS*	Engineering Technology Certificate

New Potential Curriculum
- **Open for discussion**

New Equipment/Software:
- **Open for discussion**

Future Staffing and Space Requirements:

- Additional space is needed for equipment (Romer arms) and Inspection Workstations. Another Instructor is needed to teach the Metrology Program and other disciplines. This request has been put into the Program Review for approval.

Donations:

- Gene Haas Scholarship- $15,000-for year 2022-2023
- CAM Tooling Association Scholarship-$1500
- Horatio Alger Association-$2500
- Master Chemical/Coast Industrial's donations include—Trim Sol Microsol 585xt Coolant, oils, cleaners, and cutting tools.
- Esprit Software-CAD/CAM software

Student Recruitment and Conference Activities:

- Machine Technology Facebook Page
- Fullerton College Machine Technology LinkedIn Page
- Technology and Engineering Website-revised
- Major Declaration Day-March 2023
- Mfg. day-October 2022
- Vital link Manufacturing College Panel Discussion-February 2023

Round Table Discussion

- **Directed by Faculty**

Note: See addendum materials for Programs and Courses above.

Committee Members request and comments (Open forum)

Meeting Minutes

Please note that zip files containing the courses and programs for Machine Technology and Technology departments were emailed (on April 11th, 2023) to committee members prior to the meeting on May 5th, 2023 for review.

Attendees:

Field Nguyen, Career Education Counselor,
Ken Starkman-Dean of Technology and Engineering,
Kyle Hammell - Keysight Technologies,
Brooke Haueisen- Metrology Instructor
Chris Redpath- Patriot Racing Industries
Victor Okhuysen-Cal Poly Pomona-Engineering
Dan O'Brien-Machine Technology Department Coordinator
George Bonnand-Machine Technology Instructor
Christi Subia-Bedard Machine Incorporated
Chrissy Soret-Network Kinection, LLC
Andrew Aguillon-Eminence Technology
Ray Moore-Raycon Industries
Justin Hearons-Raycon Industries
Maroun Nehme-Buena Park High School

Meeting came to order at approximately 3:15 PM on 5-5-23 in room 728 at the Fullerton Campus.

Ken Starkman (Dean of the Technology and Engineering) welcomed everyone to the meeting and made some introductory comments to the committee.

Dan O'Brien (Department Coordinator) welcomed committee members and asked that everyone introduce themselves to the committee. Members introduced themselves to everyone during the meeting. Dan then began by presenting the agenda items for the meeting.

Department Overview:

Dan O'Brien gave an overview and history of the courses and programs that we currently have in place to serve the students of the Machine Technology, Metrology Technology, and the Technology programs.

Apprenticeship Programs:

A brief overview of the programs and the apprenticeship programs at Fullerton College was presented by Dan O'Brien. We currently have two apprentices from the CTMAA program at Fullerton College who are with Keysight Technologies. We have two other apprentices who are in the program who will be continuing with the program next semester. Dan also gave a recap of the Disney apprenticeship program which is no longer available to Disney employees. We have encouraged former and current of employees of Disney who are in machine courses/program currently (and in the past) to pursue their educational goals at Fullerton College.

New and On-Going Department Grants:

An overview of past and present funding from SWP was given. Dan gave a summary of where money was spent and where money is needed next. New equipment, software, and repair of existing equipment is necessary currently. SWP funding proposals for the 2024-25 has not been submitted at this time however money will be requested in the future.

An overview of past and present funding from VTEA was given. Dan gave a summary of where money was spent and where money is needed next. VTEA funding has not been requested from our department for the up-and-coming year/cycle at this time. A request for funding may be requested in the future.

Discussion from committee members ensued around types of funding, the origins of funding, and how funding was secured/awarded.

New Curriculum/Courses/Certificates -Review of Courses and Programs (Unit Revision, Descriptions, SLOs, Objectives, Course Content/Outlines, Textbook, etc.):

Dan O'Brien and George Bonnand gave a history and summary of the programs and courses in Table 1, 2, 3, and 4. A status of current programs under revision was given. Revisions to the current Mastercam certificate, Surfcam certificate as well as a new Mastercam certificate was discuss with members of the committee. New software/updates for these programs/courses will be necessary. Committee members agreed with all suggestions made for updates and improvements.

New Potential Curriculum

Dan O'Brien gave a brief overview of the new potential curriculum. The Surfcam Certificate program will be renamed to the Computer Aided Manufacturing (CAM) certificate and will be a 9-unit certificate. This course will include the MACH 154 F, 156 F, and the 157 F courses. A new course (MACH 151 F) will be added to the machine technology mix to teach students advanced skills in programming CNC lathes. The Mastercam certificate will be revised and updated to include the new MACH 151 F course making it a 9-unit certificate. These courses/programs are all in the Curriculum process pending approval.

Dan stated he would like to develop a new additional Mastercam Certificate for multi-axis machines. A conversation/discussion ensued around the type of software that should be used for screw machines and multi-axis machines. A question was asked as to which type of software would be best for this type of course. One member stated that Esprit and Part Maker were used in his company and suggested a common ideal software such as Esprit could be used in many applications. Members of the committee and faculty agreed with this suggestion and the suggestion of a new Mastercam certificate for multi-axis machines. A spirited discussion ensued regarding PC Dimas and Veri-Surf between committee members. A wealth of information and insights to current software was discuss and shared. Both software's seem to be used interchangeability to some extend depending on business needs, equipment, and complexity of parts at companies.

Several committee members made suggestions that perhaps short or small specialized certificates could be developed and given to address immediate employer needs. This could be done by partnering with businesses. Other colleges such as Cerritos and Saddleback are doing this currently. This was done in the past with through our Contract Education department at the district. Suggestions for short

certificates included courses GDT, ASME, PC Dimas, Veri-Surf, and similar areas. Another member suggested that perhaps a small course for the fundamentals of Mazak or Okuma could be made available to students and employers. A comment was made that Boeing is using Veri-Surf now in all of it's manufacturing areas.

George Bonnand stated that our Manufacturing Processes course (TECH 108 F) was going to be offered in the Summer 2024 as a Study Abroad course with 4 weeks of instruction in person on campus and two weeks in Germany. There will be 6 plant tours in 9 days in Germany. One member of the committee stated that perhaps this course could be a transferable course to Cal Poly Pomona upon approval from Cal Poly Pomona. George Bonnand agreed and stated he would look into this further.

One member of the committee suggested that a Manufacturing Entrepreneurship program/course should be developed that explains step by step how to start a business. Discussion ensued around what this might entail and possible other courses in the college that could be doing this as well. A joint effort between divisions and departments would be required. Further investigation into this would be required as we currently have at least one certificate and one AS degree in the Entrepreneurship area.

One member of the committee suggested that we recruit more heavily veterans into the program. Veterans entering Fullerton typically register at the Veterans Resource Center. A suggestion of going to VA office at Fullerton as well as going to offsite facilities such as Camp Pendelton and the VA hospital could yield more students. This was welcomed by the committee and faculty alike. The issue of who is to do this was discussed. Currently, there is no CTE director since the vacancy of this position 3 months ago.

New Equipment/Software:

Dan O'Brien gave an update on the new Esprit software that was donated to the college. Issues and problems have occurred with the implementation of this new software at the college. IT support has been trying to fix re-occurring issues that impair the operation of this software with college computers. At this time no real solutions have been developed to fix this issue with college computers. The software appears to work well in the private sector however with school firewalls in place this seems to be an issue that is a challenge to fix.

Future Staffing and Space Requirements:

Committee members were made aware of additional space that is needed for equipment (Romer arms) and Inspection Workstations. Discussion between faculty and members ensued on this subject. Advisory Committee Members supported this addition.

Committee members were made aware of an additional Instructor that is needed to teach the Metrology Program and other disciplines. This request has been put into the Program Review for approval. Discussion between faculty and members ensured on this subject. Advisory Committee Members supported this request for extra space.

Donations:

Dan O'Brien spoke about donations from several organizations (listed below) including past donation from private individuals that have donated tools.

- Gene Haas Scholarship- $15,000-for year 2022-2023
- CAM Tooling Association Scholarship-$1500
- Horatio Alger Association-$2500
- Master Chemical/Coast Industrial's donations include—Trim Sol Microsol 585xt Coolant, oils, cleaners, and cutting tools.
- Esprit Software-CAD/CAM software

Student Recruitment and Conference Activities:

Dan O'Brien spoke about several recruitment efforts made by faculty during the year (listed below):
- Machine Technology Facebook Page
- Fullerton College Machine Technology LinkedIn Page
- Technology and Engineering Website-revised
- Hexagon Live-June 2022
- Hexagon Live-June 2023-Panel Discussion
- Major Declaration Day-March 2023
- FC Day-May 2023
- Mfg. Day -October 2022
- Vital link Manufacturing College Panel Discussion-February 2023

Several Committee members made some helpful suggestions regarding current social media efforts that could be made to boost recruitment. The following is a list of suggestions:

- Develop a Tik-Tok, Twitter, and Instagram account for the Machine Technology program.
- Obtain or create a video of the Machine Technology program which could be posted onto these accounts.
- Ask a communication or journalism student or a student in the communication or journalism club to help with the development and management of these accounts.
- Advertise the "Promise Program" to students.
- Advertise the 2-year free tuition program to students at Fullerton.

Round Table Discussion

   Round Table Discussion
- **Directed by Faculty**
   - **Department Motions by Committee Members to Approve the following:**

New	Revised	Programs or Courses or other agenda items in need of updating and endorsement by the Advisory Committee	First Motion	Second Motion	Approved
x		Motion and vote to maintain a class size of 20 or less.	x	x	x
x		Addition of 1 Head count	x	x	x
x		Additional space for Metrology lab and/or other programs	x	x	x

x	x	All course materials (with new/updates as necessary by faculty) mentioned in Table 1 and 2	x	x	x
x	x	All programs associated with Machine, Metrology, Technology, Metallurgy, Technology, and others (with new/updates as necessary by faculty) in Table 3 and 4	x	x	x

A spirited discussion around the programs and courses and how to recruit students into the program and courses occurred. Many other subjects arose and were discussed.   One committee member suggested that any suggestions or request be made via email to the faculty so that it may be included in proposals or meeting minutes as later proof to support a request or suggestion.

Meeting was adjourned at 5:11 PM