

COLLEGE OF
MARIN

Machine and Metals Technology Advisory Committee Meeting

MINUTES

Tuesday, October 13, 2020; 4 – 5:30 p.m. PST

Welcome and Introductions

Industry guests included:

- Jim Dour, owner of Megacycle Cams, has been in business for 51 years. His business works with machining and CNC to modify and create high performance cams for motorcycles and automobile engines. Megacycle has approximately 5-8 employees. Megacycle has hire COM students and graduates in the past.
- Joe Osborn, founder of OMW Corporation, is in business in making aerospace – rocket, launch and space vehicles parts. This company has approximately 40 employees and 20 CNC machines. They consider themselves as a contract manufacturing company. The manufacturing work pertains to programming and quality control. OMW has hire COM students and graduates in the past.
- Becky Rivera, Tesla, recruiter currently hiring for general assembly and powertrain
- Ricky Baeza, Tesla, recruiter also supporting efforts for general assembly, powertrain, and the manufacturing group including CNC castings.

College of Marin attendees included:

- Ron Palmer, Instructor and Chair for Career Education programs
- Alina Varona, Dean of Career Education and Workforce Development
- Derek Wilson, Instructor and Curriculum Committee member, assisting with new curriculum for Machine and Metals Technology
- Alex Jones, Internship and Student Services Coordinator
- Heather Rahman, Workforce Development and Program Partnership Specialist

Marin County of Education attendees included:

- Jesse Madsen, Project Manager with Career Technical Education with area high schools
- Araceli Nunez, Assistant Project Supervisor involved with pathway coordination at the K-12 level

Ron Palmer opened the meeting with welcoming everyone. He explained the meeting would concentrate on machining education and education. Historically, College of Marin (COM) has integrated welding with machining, but for specialized items the college has decided to separate the two sectors to provide relevant training in each sector.

Alina stated our goal is to update our programs in a way that best prepares the students for employment after completion. The validation from industry leaders can help bring together the academic talent and technical content expertise with the what's happening out in the field.

Discussion in changes in the industry and job changes

Discussion in minimum skills for entry position

Jim stated Megacycle Cams has a 3-axis CNC machine, a very unique CNC cam shaft grinder plus manual machines and grinders. They are trained for other jobs by that time. New employees typically enter at the ground floor position with on the job training upon hiring as a general helper or machine operator depending on their experience. The company looks to College of Marin for talent and has hired several MACH students as permanent employees. Megacycle entry-level employees start at \$20-26 per hour with medical benefits and are paid \$40 per hour at the top level. The work is repetitive, but the quality results comes from paying attention and doing things right. After 10 years, employees tend to burn out as result of the repetition and transition to other companies—one employee went to work for TiNi Aerospace, Inc. in San Rafael to machine high-precision aerospace parts, another student is now the foreman at General Grinding in Oakland, and a third student opened his own machine shop in Richmond.

Joe stated the OMW Corp. has a larger hierarchy of positions from apprentice machine operator all the way to CNC programmer. The highest CNC programmer position earns a salary in the 6-figure range. They recruit sometimes from job postings in Craigslist or look for skilled labor from other companies laying off employees.

Joe continued pointing out that through the curriculum, students can benefit most by learning the industry language/vocabulary and getting a good feel for cutting metal. But, also, they can also benefit in learning to program the CNC machine. They should be exposed to CAD (computer aided drafting) and CAM (computer aided machining).

Both Jim and Joe said the commute difficulties and cost of living creates challenges in hiring and retaining employees at their companies in the entry and mid-level positions. Jim added that he would like to see skilled candidates from the College of Marin MACH program, and in addition to technical skills should possess excellent soft skills—such as showing up on time and independent problem solving.

Alina asked for job descriptions to see what employment looks like for entry level positions and progressing into higher roles. COM would ultimately let students know COM is a place for training and that they can connect to employment as competitive candidates.

NOTE: Joe Osborn provided OMW Excel sheets that outlines skills required by position and the corresponding level (see attached PDF).

For Tesla, Ricky stated the basic entry level would be a material handler or a production assistant/associate in manufacturing. Technicians are the equipment maintenance for CNC, programming, process and quality control. Some entry level positions are technicians with a starting salary at about \$28K and go up, and as employment progresses titles often stay the same but the experience can lead to over \$100K salaries.

Students finishing a program should be ready to interview for entry level positions if they have picked up skills such as PLC (Programmable Logic Controllers), hydraulic and pneumatic systems, including CNC operation and basic programming. Transferable skills also are big at Tesla such as welders, support for hiring veterans/armed forces, particularly those with technical trained skills or aviation. The robotic technology at Tesla is manufactured by Kuka and Fanuc. This is such a niche skill that most people would not already possess. As a result, this is where existing training and skills can be transferrable.

CNC, Lathe and Metal Machine Upgrades

The machine shop at College of Marin has been running for about 40 years, with retirements including where we have seen a couple of retirements. Since Arthur Lutz's retirement last year. Since Professor Lutz's retirement, Ron has been overseeing the program. With the shutdown due to COVID-19, the CE Department and the college are using this time to revamp the facility with the upgrade with a new CNC mill and a CNC lathe, and other necessary equipment. However, this will not take place until after the current facility is assessed for regional and state code, and ADA accessibility compliance requirements are determined for the space within the machine shop

Review of Curriculum

Derek shared a slide demonstrating what the current MACH course requirements are for the COM AS degree and a Certificate of Achievement in Machine Metals Technology, in comparison with the proposed courses and programs for a revised COM AS degree and a Certificate of Achievement in Machine Metals Technology, and potential viability of smaller Skill Certificates for Machine Metals Technology.

(see Figure 1: Machine Metals Technology Program Current and Proposed Courses slide, below)

The committee feedback was as follow:

- Add CAD and CAM stand-alone classes and CAD-CAM concepts early in the program.
- CAD can tie in with other programs in other educational sectors, whereas CAM may be specific to machining. Perhaps CAD-CAM would be beneficial for Engineering and Industrial Design transfer students.
- 3D Solid modeling programs are preferred as opposed to 2D surface modeling programs for CAD-CAM.
- AutoDesk paradigm is a preferable choice at OMW Corp and is highly recommended. NOTE: Autodesk has been purchasing other CAD-CAM companies to incorporate into their suite of CAD-CAM software, like Fusion 360. As an educational institution, the college can install any and all Autodesk applications for free. In addition, any COM students have free educational licenses for all Autodesk applications.
- MCOE participants noted that "the high schools already have several CTE pathways that use Autodesk software (AutoCAD, Fusion 360, Inventor, etc.), and SolidWorks. Jesse: "I would have to gather more information on how advanced the students get with this software used in the classes - namely Architecture and Engineering classes. 3D modeling is also done in VR game design. Students will use Unity for game design but might use Adobe and Autodesk modeling software to create 3D assets to plug into a VR game."
- Students completing with a Certificate of Achievement or AS degree would put a student in a good pathway to interview for a machine operating position.
- The skills certificates would not necessarily prepare the student for entry-level or other employment.
- Existing workforce could be interested in a CAD/CAM courses depending full scope of the classes offered and the equipment utilized.
- Add quality control and quality assurance systems such as ISO 9000.
- Offering online lecture classes with flexible lab times (i.e. DE Hybrid classes) would probably attract those working in the industry to enroll to up their skills.

Figure 1: Machine Metals Technology Program Current and Proposed Courses slide

CURRENT	Machine Metals Technology
MACH120	Machine Technology I (4.0)
MACH121	Machine Technology II (4.0)
MACH140	Intermediate Machine Tool Processes (4.0)
MACH145	Computer Numerical Control Machining/Mill (3.0)
MACH155	Computer Numerical Control Machining/Lathe (3.0)
MACH240	Advanced Machine Tool Processes (4.0)
MACH250	Applications of Machine Tool Technology (2.0)

PROPOSED	Machine Technology
MACH100	Career Math & Measurement (4.0)
MACH101	Introduction to Machine Technology (4.0)
MACH102	Intermediate Machine Technology (4.0)
MACH103	Machine Tool Processes (2.0)
MACH104	Advanced Machine Tool Processes (2.0)
MACH105	Machine Production Manufacturing (2.0)
MACH106	Introduction to CNC Machining (2.0)
MACH107	Advanced CNC Machining (2.0)

AS COM Degree in Machine Metals Technology	Credits
AS COM Degree in Machine Metals Technology	24.0

AS COM Degree in Machine Technology	Credits
AS COM Degree in Machine Technology	22.0

Certificate of Achievement Machine Metals Technology	Credits
Certificate of Achievement Machine Metals Technology	24.0

Certificate of Achievement Machine Technology	Credits
Certificate of Achievement Machine Technology	22.0

Skill Certificate in Machine Technology I	Credits
Skill Certificate in Machine Technology I	12.0
MACH100	Career Math & Measurement (4.0)
MACH101	Introduction to Machine Technology (4.0)
MACH102	Intermediate Machine Technology (4.0)

Skill Certificate in Machine Technology II	Credits
Skill Certificate in Machine Technology II	6.0
MACH103	Machine Tool Processes (2.0)
MACH104	Advanced Machine Tool Processes (2.0)
MACH105	Machine Production Manufacturing (2.0)

Skill Certificate in Machine Technology III	Credits
Skill Certificate in Machine Technology III	4.0
MACH106	Introduction to CNC Machining (2.0)
MACH107	Advanced CNC Machining (2.0)

Conclusions:

Ron specified that we want to make career pathways that attract the students for the MTT programs looking for skills to prepare for employment opportunities. Perhaps next time, we can think of the next level of course sequencing to prepare students beyond the entry level jobs to address displaced professionals looking to uplift skills for emerging positions in Machine Metals Technology.

Actionable items include:

- Derek and Ron will share a summary of revised course outlines and student learning outcomes with the industry representatives.
- The industry leaders will send some of their job descriptions or job postings to Ron and Derek which will help in curriculum building. Send to rpalmer@marin.edu and/or dwilson@marin.edu.

Thank you to all who attended and contribute!

The meeting adjourned at 5:30 p.m.