



OAKLAND
COMMUNITY
COLLEGE

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MACHINE TOOL TECHNOLOGY ADVISORY COMMITTEE MEETING

September 30, 1997

Present: Steve Atma, Faculty, OCC
Bruce De Bruyne, Bridgeport Machines Inc.
James Doherty, Ford Motor Company
Bob Harsha, Lapeer Metal Stamping Companies
Dave Johnson, C. M. Smillie & Co.
Charlie Kurzer, Counselor, OCC
Edwin Marcum, Manufacturing Engineering Specialist
Dr. Carlos Olivarez, Dean, Academic and Student Services, OCC
Karen Pagenette, Workforce Preparation Services, OCC
Ruth Springer, Secretary, OCC
Paul Wayrynen, Paraprofessional, OCC

Current and Future Trends: Feedback from Industry

Dr. Carlos Olivarez welcomed the group and asked the members to introduce themselves. He then asked the industry representatives to provide feedback regarding changes projected in the industry in the next few years, so that the College can plan to remain current and stay ahead of those changes.

Mr. Dave Johnson responded that there will always be a demand for manual machining, and this can serve as a good stepping stone to learning Computer Numerical Control (CNC) programming. CNC is a wide open field. Things happen faster than can be predicted. At C. M. Smillie & Co., they are constantly upgrading machines, but there are a lot of older machines that continue to be used. Mr. Johnson doesn't believe manual machining will ever be replaced, because if only one or two parts are needed, it is a waste of time to use a CNC machine. Employment demand is good, and entry level pay is good, better than many other jobs which are more respected in the public perception. People see being a machinist as a job where you get your hands dirty. However, it takes an intelligent person to be a good machinist.

Mr. Bruce De Bruyne agreed that there is a constant need for machinists in this area.

Mr. Bob Harsha commented that his company deals with a number of smaller shops that still do manual machining. He believes that the making of fixtures should be addressed in OCC's Machine Tool Program.

Machine Tool Technology Advisory Committee

September 30, 1997

Page 2

Mr. Edwin Marcum stated that he sees OCC's Machine Tool Program and facilities as a graduate school for engineers. Universities turn out fine engineers, but they need practical, hands-on machining experience. He believes OCC should market its program to Ford, General Motors, and Chrysler as an opportunity for engineers to learn processing by working hands-on with the machines. Mr. Marcum described a successful EDS program in which engineers are given 11 weeks of theoretical training and then spend several days at OCC trying to apply what they have learned in a situation which is as much as possible like a real world experience. By the time they have finished, they have learned how to run several machines. Those who have taken the program describe it as being very valuable. It is for that reason that Mr. Marcum believes that OCC can serve as a graduate school for the universities.

Mr. Charlie Kurzer asked about the range of pay in the field, and whether there is much difference between the manual machinist and a person doing CNC. Mr. Johnson responded that operators who are simply pushing buttons would receive an entry-level pay rate of \$7 - \$8 an hour. Those doing their own set-ups would be better paid, probably \$10 an hour. Employees could receive \$2 - \$3 an hour more if they are graduates of the Machine Tool Program.

Mr. Harsha commented that, if a person took the program at OCC, then became an apprentice, then a journeyman, he or she could make a very good living. In his own case, he began as a machinist, then went into Computer Aided Design work. CAD/CAM software is being used in more shops all the time, and it is possible to make \$60,000 - \$70,000 a year. This would be true for a good die maker as well.

Ms. Karen Pagenette referred to the Machine Tool training program conducted by OCC's Workforce Development Services. It is a 15-week program, and students earn 24 credits. The average entry level salary for those who complete the program is \$10.86 an hour. People with experience begin at \$12 - \$15 an hour.

Mr. Harsha stated that, in Lapeer County, wages are not as high as in Oakland County.

Mr. Kurzer asked whether machinists and tool and die people frequently jump from shop to shop in order to receive better pay. Mr. Atma responded that it is often easier to get a raise that way than to stay in the same shop and try to get a raise there. Mr. Johnson agreed, saying that in some places, more experienced people are not willing to show a newer employee what they know, because of their concern about job security. Mr. Marcum mentioned that seeing how people do things in other companies also helps to round out an employee's experience. Mr. Harsha pointed out that the trend to jump from shop to shop is prevalent in the automotive industry as a whole.

Dr. Olivarez asked whether more shops are being established in this area. Mr. De Bruyne responded that there is growth, but there are also a lot of acquisitions taking place in which a large company acquires a smaller company. It is often easier to expand in that way, rather than constructing another building. Mr. Harsha agreed, stating that mega-suppliers to the automotive industry often buy up

smaller shops, which then continue to do what they did before, but now as a part of the larger company.

Mr. De Bruyne and Mr. Doherty stated that a big growth area is in rapid prototyping.

Tour of Machine Tool Facilities

Mr. Steve Atma led the group on a tour of the recently updated Machine Tool facilities, so that members could see the equipment which has been obtained in response to previous advisory committee recommendations.

Curriculum Revision

Dr. Olivarez explained that, following each advisory committee meeting, OCC members of the committee meet to determine what actions need to be taken in response to the advisory committee recommendations. He called the group's attention to the minutes of the follow-up meeting of OCC staff members held on June 19, 1997, and stated that the rest of the meeting would be spent reviewing those minutes and providing a progress report as to what has been done. If there is not enough time to report on all recommendations, the remainder will be covered at the next advisory committee meeting to be held during Winter 1998. The group considered Recommendation 1.

- 1. That ATM 215, APT Programming Applications, and ATM 216, APT Language Programming, be removed from the Numerical Control curriculum and replaced with more current subject matter.**

Mr. Steve Atma reported that he is working on a plan for curriculum revision to bring OCC's Machine Tool Program into line with the curricula at Oakland Technical Center - Southeast (OTC-SE) and Ferris State University, in order to provide a smooth transition for OTC graduates who wish to continue their studies at OCC and then go on to Ferris. As a part of this process, Mr. Atma is attempting to work with Mr. Bob Globke of OTC-SE to establish a Tech Prep agreement for the Machine Tool Program.

Mr. Atma asked the group's opinion as to what changes might be made in the program to encourage students at the Oakland Technical Centers to continue their studies at OCC. We now have the capability of teaching SurfCam, which will replace what is currently being taught in ATM 220, Numerical Control Machining, and ATM 230, Three-Dimensional Contour Machining. Mr. Atma believes we will also need a third SurfCam class in order for students to become marketable. We are licensed to install SurfCam on 15 computers.

Mr. Atma does not believe that the Technical Centers have SurfCam, and he believes their students would be interested in learning to use it. He believes we need advertising to attract them to visit and study here. He asked the group what else we need to be doing.

Mr. Marcum suggested that OCC produce a video to show to high school students. Mr. Atma responded that we will be sending out 100 videos to industry and schools. He believes that will help.

Dr. Olivarez suggested that we need to invite the Technical Center instructors to OCC for a tour and luncheon.

Mr. Harsha suggested that, once a semester, OCC staff take equipment to the high schools and do a demonstration for the students. Mr. Johnson suggested that students could get entry-level positions straight out of high school, and then companies would pay for them to take classes at OCC.

Mr. Harsha pointed out that some of the Technical Centers are doing the same type of thing that is being done at OCC. He suggested that OCC introduce rapid prototyping in its classes, so students can see it is possible to move on from machining parts to a more advanced level.

Ms. Pagenette suggested that perhaps high school students who earn a particular grade point average could be offered scholarships to take advanced level courses at OCC.

Mr. Harsha commented that, since students take two years of machining at the Technical Centers, they graduate from there as pretty good machinists. They would probably not need to take the first year of OCC's Machine Tool Program. Mr. Atma agreed, stating that we need a program that would be more advanced than what we have now.

Mr. De Bruyne suggested that a letter be written to Technical Center students explaining what is available at OCC and inviting them to attend.

In regard to ATM 215 and ATM 216, it was explained that the instruction which would have been given in those classes is not appropriate now, as APT Language Programming is no longer used in the industry. Those courses will be replaced with more current subject matter as part of the curriculum revision being put together by Mr. Atma.

Mr. Kurzer pointed out that students in the Numerical Control Option are currently required to take the following math courses:

- APM 811 Geometry Algebra
- APM 821 Plane Trigonometry
- APM 823 Solid Trigonometry
- APM 827 Compound Angles
- MAT 115 Intermediate Algebra
- MAT 156 Trigonometry

Mr. Kurzer asked whether any of these courses could be removed from the program. He pointed out that there is duplication between the APM and MAT courses and asked whether we could choose one set of math requirements and eliminate the other.

Mr. Harsha agreed that this might be a good idea, as he believes the math requirement probably scares a lot of students away from the program.

Mr. Johnson suggested that basic Drafting and Descriptive Geometry courses be added to the program. He stated that, when he took the Compound Angles course, he had not taken Drafting classes, and he had difficulty doing the work. He believes Drafting classes would help students in the Solid Trigonometry and Compound Angles classes.

Mr. Harsha expressed the opinion that Machine Tool students should take the apprentice math (APM) courses, as that would put them ahead if they go on to become journeymen.

Mr. Kurzer pointed out that APM 827 lists as prerequisites DDT 100, Fundamentals for the Drafting Industry, and DDT 105, Product Drafting. Perhaps those two courses should also be included in the Machine Tool curriculum.

Mr. Atma will work with Mr. Kurzer to make appropriate changes in the curriculum. A draft of those changes will be presented to the group at the next advisory committee meeting.

Mr. Kurzer suggested that perhaps some CAD courses could be added to the program. Mr. Johnson suggested adding DDT 100 and DDT 105 or DDT 115, Descriptive Geometry.

Dr. Olivarez suggested that perhaps a new course could be developed using the new equipment that is now available. Mr. Atma agreed that this must be done in order to attract students from the Technical Centers. We must not eliminate the basic Machine Tool program which we currently have in place, but we need to add more advanced courses.

Mr. Harsha suggested that there could really be three programs, if OCC develops courses in advanced machining, which could be targeted at people already working in the field who need more advanced skills beyond the level at which they are currently working. Perhaps the basic Machine Tool Program could be combined with the Numerical Control Option, as students will be more marketable if they have had training in CNC and computer work.

New Advisory Committee Recommendations

16. That the making of fixtures be addressed in OCC's Machine Tool Program.
17. That OCC consider marketing the Machine Tool Program as an opportunity for engineers to learn processing by working hands-on with the machines.

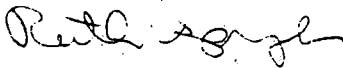
Machine Tool Technology Advisory Committee

September 30, 1997

Page 6

18. That the Technical Center instructors be invited to OCC for a tour and luncheon.
19. That OCC staff attempt to take equipment to high schools and do demonstrations for the students.
20. That OCC consider introducing rapid prototyping into its classes.
21. That OCC take steps to eliminate the duplication in math courses in the Numerical Control Option.
22. That OCC consider adding DDT 100, Fundamentals for the Drafting Industry, and DDT 105, Product Drafting, or DDT 115, Descriptive Geometry, to the Numerical Control Option.
23. That OCC consider combining the basic Machine Tool Program with the Numerical Control Option and/or creating an additional option to include courses in advanced machining targeted at people working in the field who need more advanced skills.

Respectfully submitted,



Ruth Springer

(advf97:atm0930.min)

**PROCESS MANUFACTURING
TECHNOLOGY (PMT)
WORKING COPY 2-26-98**

AUBURN HILLS

ASSOCIATE IN APPLIED SCIENCE

MAJOR REQUIREMENTS		CREDITS
* ATM130	INTRODUCTION TO NUMERICAL CONTROL	3
* ATM210	BASIC N/C PROGRAMMING	3
* ATM220	CAD/CAM INTRODUCTION	3
* TED 103	BASIC BLUEPRINT READING	3
* APM 811	GEOMETRY ALGEBRA	3
* MEC101	INTRODUCTION TO MANUFACTURING PROCESSES	3
* CIM110	INTRODUCTION TO COMPUTER INTEGRATED MANUFACTURING	4
* QAT102	STATISTICAL PROCESS CONTROL	3
* ROB150	INTRODUCTION TO ROBOTICS	4
REQUIRED SUPPORTIVE COURSES		
ATF140	INTRODUCTION TO HYDRAULICS	3
ROB204	PROGRAMMABLE CONTROLLER APPLICATIONS	4
EEC102	DC FUNDAMENTALS	3
EEC104	AC FUNDAMENTALS	3
CAD110	INTRODUCTION TO COMPUTER AIDED DESIGN AND DRAFTING	3

**GENERAL EDUCATION REQUIREMENTS
SEE GRADUATION REQUIREMENTS FOR
ASSOCIATE IN APPLIED SCIENCES
DEGREE ON PAGES 48, 49, 50, & 51.**

TOTAL CREDITS 65

*** WHEN ALL COURSES MARKED WITH AN ASTERISK ARE COMPLETED, THE STUDENT MAY APPLY FOR A CERTIFICATE.**

**ADVANCED MANUFACTURING
TECHNOLOGY (AMT)**

WORKING COPY 2-25-98

AUBURN HILLS

ASSOCIATE IN APPLIED SCIENCE

MAJOR REQUIREMENTS **CREDITS**

* ATM 110	INTRODUCTION TO MACHINE TOOLS	3
* ATM 112	PRECISION MACHINING APPLICATIONS	3
* ATM 114	MULTIPLE PART MACHINING	3
* ATM 118	SURFACE & CYLINDRICAL MACHINING	3
* ATM 130	INTRODUCTION TO NUMERICAL CONTROL	3
* ATM 210	BASIC N/C PROGRAMMING	3
* ATM 220	CAD/CAM INTRODUCTION	3
* ATM 230	ADVANCED CAD/CAM	4
* TED 103	BASIC BLUEPRINT READING	3
* APM 811	GEOMETRY ALGEBRA	3
* APM 821	PLANE TRIGONOMETRY	3

REQUIRED SUPPORTIVE COURSES

QAT 102	STATISTICAL PROCESS CONTROL	3
CIM 230	INTRODUCTION TO CAD/CAM	4
CIM 240	FLEXIBLE MANUFACTURING SYSTEM	4
ROB 150	INTRODUCTION TO ROBOTICS	4

**GENERAL EDUCATION REQUIREMENTS
SEE GRADUATION REQUIREMENTS FOR
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TOTAL CREDITS 69

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