




OAKLAND  
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COLLEGE

Memo

**DATE:** May 21, 1997

**TO:** Linda Casenhiser  
Dave Doidge  
Sally Kalson  
Tahir Khan  
Willie Lloyd  
Pat May  
Margaret McNeal  
Marty Orłowski  
Tom Sawasky  
Diann Schindler  
Donald Tremper

**FROM:** Carlos L. Olivarez   
Dean, Academic and Student Services

**SUBJECT: DRAFTING ADVISORY COMMITTEE MEETING**

There will be a meeting of the Drafting Advisory Committee on Friday, May 30, 1997, from 10:00 a.m. to 12:00 noon in room T6. Lunch will be served during the meeting. The meeting agenda is attached, as well as the minutes of the meeting held on April 11, 1997.

Please call Ruth Springer (extension 6525) or e-mail her (RASPRING) to let her know whether you will be able to attend.

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## DRAFTING

### ADVISORY COMMITTEE MEETING

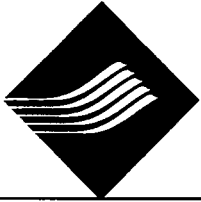
May 30, 1997

10:00 a.m. - 12:00 noon

Room T-6

## AGENDA

1. Welcome and Introductions
2. Review of Minutes of Previous Advisory Committee Meeting
3. Continuation of Discussion from Previous Advisory Committee Meeting Regarding Curriculum
4. Assessment of Graduates
5. Job Outlook: Pay, Promotion, Growth, Migration
6. Potential for Growth of Profession in Oakland County/Southeast Michigan
7. Student Membership in Professional Organization
8. OCC Mission and Purposes
9. Open Discussion
10. Lunch



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## DRAFTING ADVISORY COMMITTEE MEETING

April 11, 1997

Present: Linda Casenhiser, Manufacturing & Technological Services, OCC  
Sally Kalson, Coordinator of Cooperative Education, OCC  
Tahir Khan, Chair, Technology Department, OCC  
Pat May, Counselor, OCC  
Margaret McNeal, Adjunct Faculty, OCC  
Dr. Carlos Olivarez, Dean, Academic and Student Services, OCC  
Charles Rondeau, Saturn Corporation  
Tom Sawasky, Faculty, OCC  
Grant Sherman, General Motors Die Management Group  
Henry Sommerstorfer, General Motors Truck Group  
Ruth Springer, Secretary, OCC  
Robin Stewart, Universal Flow Monitors, Inc.  
Bruce Sutton, North Farmington High School  
Clifton E. Tally, Jr., MSX International  
Donald P. Tinsley, Hawtal Whiting Inc.

### 1. Welcome and Introductions

Dr. Carlos Olivarez welcomed the group and thanked them for their willingness to assist OCC as members of the advisory committee. He asked those present to introduce themselves. The group then toured the Board Drafting Lab, the Computer Aided Design Lab, and the lab used in teaching the Manufacturing Processes (MEC) classes.

### 2. Importance of Instruction in Board Drafting

Following the tour, Dr. Olivarez asked the group for their comments regarding the labs they had visited. Mr. Charles Rondeau stated that he was impressed with the number of stations and the variety of software.

Mr. Donald Tinsley commented that the focus on the manual side of the business is good. He stressed the importance of visualization in order to be successful on the job. Many people coming into the workplace today are good at operating the computer, but are poor designers.

Mr. Grant Sherman agreed, stating that visualization is the biggest problem that he sees. He finds that the best designers are those who excel in drafting.

Mr. Bruce Sutton commented that the college has to work with the students it receives from the high schools. Parents and industry leaders need to take a look at the training students are receiving in the high schools. High school administrators are emphasizing computers and saying that students do not need to work on drafting boards. However, industry knows that students must have the knowledge gained working on the boards in order to use the computer effectively. Industry needs to make statements that are quoted in the newspapers emphasizing that board drafting skills are essential for industry. That would help get the message to parents and high school administrators. Mr. Sutton stated that he has always emphasized drawing on boards, and he will continue to do so. He believes that what OCC is doing in this area is good. He has worked with Mr. Tom Sawasky and Mr. Tahir Khan on the Tech Prep curriculum which coordinates the training students receive in high school with what is offered at OCC. He stated that, if high school students do not receive the training they need on the drafting board, then the college must provide it.

Mr. Khan raised the question of how much training OCC can give students within the credit hour limits of an associate degree program. Ideally, students should be taught manual skills in high school, and then OCC would provide them with more advanced training. However, some high schools do not put the proper emphasis on drafting classes, having them taught by someone who is primarily an instructor in another area. Therefore, OCC makes sure students take manual drafting courses as a part of the Computer Aided Design Program.

Dr. Olivarez asked whether OCC really needs to teach board drafting when we have computers to do the job now. He has heard arguments on both sides of the question and wondered how industry would respond to this question.

The entire group agreed that training in board drafting is definitely needed, at least until a way is found to teach basic descriptive geometry on a computer.

Mr. Clifton Tally stated that manual drafting is needed because it gives students time to acquire the skills they need to go on and use the CAD system effectively. He would like OCC to be able to teach no manual drafting classes because students coming out of high school are already trained in manual drafting. He believes students should begin to take drafting classes in the seventh grade.

Mr. Sutton emphasized that industry needs to communicate with the parents and school boards about this issue. Parents must be convinced that this instruction is needed in the lower grades.

Mr. Henry Sommerstorfer mentioned that many schools are eliminating shop and drafting classes because not many students want to take them. He believes it would be beneficial to require every seventh and eighth grader to take a drafting class. The best designer is someone who has done the work manually and now uses a computer as a tool. The designer needs to understand the process, why things are done a certain way, rather than just moving things around on the computer screen.

Mr. Khan reported that OCC is attempting to set up a 2+2 agreement with the University of Michigan Dearborn so CAD students can earn an associate degree at OCC and then continue their studies at U of M Dearborn to earn a bachelors degree in mechanical engineering. OCC already has 2+2 agreements with Wayne State University and with Lawrence Technological University. He stressed that students will continue to take manual drafting at OCC until there is a way to teach descriptive geometry on the computer. He wondered whether we are defining the skills taught in the Drafting classes as they are needed today in industry. For example, is there a need for an emphasis on lettering? What kind of visualization techniques are needed before working on the computer?

Mr. Rondeau stated that the reason we have drafting is to communicate an idea to other users all down the line. There is still a need for a good knowledge of drafting and visualization. The important thing in industry is how fast something can be done for a minimum of expense. The strategy that should be taken at OCC depends on the industry or company toward which students are aiming. Some companies want students to be able to work immediately without additional company training.

Mr. Tally commented that there is an image problem in regard to the need for drafting instruction. Parents think of drafting as a blue-collar occupation, and they want their children to become engineers. We must change the concept of what is being taught in drafting classes, so people see it as a positive stepping stone to their children's future. We need to tell people that students need to have an understanding of spatial concepts in order to go on to become engineers. Drafting classes are then presented as tools which provide students with an understanding of spatial concepts.

### 3. Review of Curriculum

Dr. Olivarez asked Mr. Sawasky to provide the group with an overview of the curriculum. Mr. Sawasky asked the group to consider whether the Drafting Program as it currently exists would make a student employable in their organizations, and at what level. He also expressed the need for a definition of basic skills needed to prepare students to work efficiently in a CAD system.

Mr. Sawasky explained that the Drafting Program leads to a certificate, not an associate degree. He reviewed the courses included in the program, mentioning that DDT 125, Advanced Descriptive Geometry Applications, is no longer offered due to lack of enrollment. In regard to MAT 154, College Algebra, and MAT 156, Trigonometry, OCC has received feedback from students and employers that these courses are not relevant to the industrial world. The College does have other math courses listed under the APM course code in which math is taught as it is applied to industry. Math courses listed under the MAT course code are more theoretical. Mr. Sawasky asked the group whether the math courses included in the program should be theoretical or practical.

Mr. Sawasky reported on a phone conversation he had with Mr. Dave Barran, a member of the advisory committee who was unable to attend this meeting. Mr. Barran expressed the view that, in his organization, a graduate of this program would only be employable for shuffling blueprints. He does not believe this certificate program alone prepares students for a good career future.

Dr. Olivarez asked Ms. Robin Stewart, a recent graduate of the program, for her opinion. She reported that she has taken all the Drafting and Mechanical Technology classes required in the Drafting Program. The instruction she received in those classes helped her obtain the job she has now as a draftsman. Her supervisor was looking for someone who understood the basics of drafting. The person she replaced was good at using AutoCAD, but Ms. Stewart has spent a great deal of time fixing the drawings done by that person. Her knowledge of the little things that make a drawing look good and be correct has been important and useful in her current job. Ms. Stewart wishes that OCC had provided her with the opportunity to make a drawing of an actual part, including measuring it herself and working out a plan for setting up the drawing. She also feels there should be more instruction in stacking tolerances. She had to be taught on the job how to take the different tolerances of the pieces being put together to come up with the overall tolerance.

Dr. Olivarez asked the group whether the four Drafting courses currently included in the program are the courses that OCC should be teaching.

The group responded that those courses cover the fundamentals and must be included in the curriculum. It is probably not possible to include all the skills needed in industry in a single program. The industry is changing all the time. Students should receive instruction in the fundamentals, along with some exposure to CAD systems. Then, as an employer begins to use a new level of a certain software, employees can return and receive training on that particular CAD system. CAD systems are changing all the time. If students have the fundamentals of descriptive geometry and drafting, as well as an awareness of CAD systems, they will be able to move on to the particular software needed by their company.

Mr. Khan agreed, stating that OCC attempts to focus on the concepts of body design, using CAD software as the tool. The focus of the program is not to have the students become experts on a particular software package.

Mr. Rondeau commented that there is good value in having these Drafting requirements in the curriculum. They can teach the students discipline and help them get in line with the way industry works. However, industry is heading as soon as possible away from drawings. The amount of time spent in lettering and setting up drawings will be reduced. In the attempt to become more efficient, attention is being called to the fact that as much or more time is spent doing the drawing as is spent in producing the part. This may be changing to achieve greater efficiency. OCC will need to stay close to industry in order to stay abreast of this trend.

A question was raised as to whether the four Drafting courses cover the basic skills needed in industry.

Mr. Sommerstorfer responded that lettering and line work could be ignored. The important thing is that students understand the process, not just the mechanics of drawing. They need to understand why they are doing things. An applied drafting class is needed to emphasize these things. Ideally students should get this type of training in high school. If they have had it in high school, they should not be required to take it again at OCC. However, many students have never taken drafting before coming to OCC. The course descriptions of the four Drafting classes look great, as long as they are providing students with the application side of drafting. If students have not learned the fundamentals, they can be taught to use a CAD system, but they will not understand why things must be done in a certain way. They will just be manipulating things, so they look good on the computer screen, but are not workable in the real world.

Mr. Sawasky reported that a curriculum is being developed for use in 32 high schools across Oakland County. This curriculum is based on the content of OCC's DDT 100 and DDT 105 courses. Students coming to OCC may receive advanced standing of 4 credits for AutoCAD and 6 credits for the two Drafting classes. Mr. Sawasky asked whether we should set program prerequisites, such as these basic courses, which students must complete before being admitted to the program. In addition, what should we consider to be the fundamentals which students must have to be prepared for success on a CAD system?

Mr. Tinsley stressed the importance of visualization. Students must also understand manufacturing and assembly processes. He suggested that perhaps MEC 101 and MEC 102 should be prerequisites to the Drafting Program.

Mr. Tally stressed the need for an understanding of spatial concepts. He believes that this is covered in the four Drafting classes. He does not believe there is a need to teach lettering anymore.

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Mr. Rondeau suggested adding instruction in freehand sketching, to be used in sketching ideas and concepts. This could be included in the current courses by eliminating instruction currently being given which is not needed in industry today.

Mr. Tally agreed, stating that sketching is a tool that can be used to convey an idea, to help people see the model which is in your mind.

Mr. Khan asked whether we should begin instructing students directly in 3D design, rather than beginning in 2D. He has found that some students do well right away in 3D, but others are lost if they don't have the basic 2D concepts.

Mr. Rondeau responded that 2D should be forgotten, as it is just a way of doing board drafting on the computer. If students have already learned the basic concepts of drafting, they should be able to go straight on to 3D.

Mr. Sawasky asked the group whether the Drafting Certificate Program as it currently exists is a viable end in itself. Much has been said by the group about the fundamentals being needed for a person to become a good designer in CAD. But is the Drafting Certificate Program with no CAD included doing the students a service, or is it just taking up space in the catalog, since very few students are actually enrolled in it? Is this a viable program as it is?

Mr. Sommerstorfer responded that the program needs to include more than it does at present. Students must have the instruction included in the program, but even with this background, they are still not up to the level needed to be productive in industry. Perhaps a simulation class could be added, using real industry problems, rather than just blocks in a textbook.

Mr. Khan commented that many companies do their own CAD training on their own software. The Drafting Program would be useful for those companies, as it provides the fundamentals needed by students before they begin learning to work on a CAD system.

The question of applied versus theoretical math classes was raised. It was pointed out that the applied math classes are not recognized by universities if a student wants to go on to a four-year degree program.

Dr. Olivarez asked the group how soon they would like to meet again. Mr. Sawasky responded that he would like to see the committee meet more often than the required minimum of two times per year. He expressed the need to complete the discussion begun here by meeting again in the near future. He would like further direction as to how to include such things as visualization skills and freehand sketching in the program. He would like to see the group meet again in late May or early June.



Mr. Tally suggested that a way needs to be found to delete ENG 151, Composition I, from the program without losing the instruction which it provides. He reported on a program at another college in which every engineering report submitted by an engineering student is also checked by a member of the English Department. He wonders whether a similar system could be developed at OCC, in which an English emphasis could be incorporated into other classes required in the student's program of study.

Dr. Olivarez responded that a number of the advisory committees have made similar suggestions. He will contact the English Department Chair to arrange a meeting with Mr. Sawasky and Mr. Khan to see how this might be done.

The group agreed to meet again in May or June, preferably on a Friday morning.

#### Committee Recommendations

1. That OCC continue to provide the instruction in manual drafting which is essential to successful work on a CAD system.
2. That OCC attempt to provide students with the opportunity to make a drawing of an actual part as it would be done in industry.
3. That OCC provide more instruction in stacking tolerances.
4. That OCC consider deleting instruction in lettering and line work from the Drafting curriculum.
5. That instruction in the application side of drafting be included in the Drafting curriculum.
6. That visualization skills be emphasized in the Drafting curriculum.
7. That instruction in freehand sketching be included in the Drafting curriculum.
8. That a simulation class be added to the curriculum, using real industry problems.
9. That ENG 151 be deleted from the program, and that the English Department work with program instructors to include English instruction in the other courses which students are required to take.
10. That the advisory committee meet again in May or June, preferably on a Friday morning.

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Remaining Unanswered Questions

1. Is the Drafting Certificate Program as it currently exists a viable program? Would it alone prepare a student for employment, and at what level?
2. Should theoretical or applied math courses be included in the Drafting curriculum?
3. Should program prerequisites, such as the basic drafting classes, be required for admission to the program?
4. How should visualization skills be included in the program?
5. How should freehand sketching be included in the program?

Respectfully submitted,



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## DRAFTING ADVISORY COMMITTEE MEETING

May 30, 1997

Present: David Barran, Modern Engineering  
Sally Kalson, Coordinator of Cooperative Education, OCC  
Tahir Khan, Chair, Technology Department, OCC  
Pat May, Counselor, OCC  
Margaret McNeal, Adjunct Faculty, OCC  
Dr. Carlos Olivarez, Dean, Academic and Student Services, OCC  
Tom Sawasky, Faculty, OCC  
Grant Sherman, General Motors Die Management Group  
Henry Sommerstorfer, General Motors Truck Group  
Ruth Springer, Secretary, OCC  
Clifton E. Tally, Jr., MSX International

### 1. Welcome and Introductions

Dr. Carlos Olivarez welcomed the group and asked the members to introduce themselves. The minutes of the Drafting Advisory Committee meeting held on April 11, 1997, were reviewed and approved as written.

### 2. Viability of Drafting Certificate Program

The group discussed whether the Drafting Certificate Program as it currently exists is a viable program, and whether it alone would prepare a student for employment and at what level.

Mr. David Barran pointed out that the group of employers who are still doing manual drafting is small and dwindling rapidly. Mr. Henry Sommerstorfer commented that the existence of the certificate program might be fooling some people, as they might think that if they earned the certificate, they would be able to get an entry level position in industry. Mr. Grant Sherman mentioned that at his location, they are eliminating the manual die design and converting to all Computer Aided Design (CAD).

The group agreed that the drafting classes are valid and needed, but they expressed doubt as to whether the certificate is viable.

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Mr. Clifton Tally pointed out that in Tier Two and Three, they are still doing lots of manual drawings, so there is work out there in manual drafting.

Mr. Tom Sawasky drew the group's attention to research done by Ms. Ruth Springer which shows that from 1993 through 1996, only six students graduated with a Certificate in Drafting. Of those six students, five also received an Associate Degree in Computer Aided Design and Drafting. The sixth has not yet received an Associate Degree, but his curriculum is listed as Computer Aided Design and Drafting. It seems clear that none of the six graduates was seeking a Drafting Certificate as an end in itself. Mr. Sawasky questioned whether it is financially viable to support a program for six people over a period of four years.

Dr. Olivarez pointed out that many students in a degree program take the core courses first and receive a certificate. This gives them something to document the level of studies they have attained and is helpful in obtaining a job in their chosen field. He asked whether the courses in the Drafting Certificate Program correlate with the CAD Associate Degree Program.

Ms. Pat May responded that ten courses are required for the Drafting Certificate. Only two of those courses are not included in the CAD Program. Those two are DDT 125, Advanced Descriptive Geometry Applications, which is no longer offered, and ELT 101, Applied Electricity.

Mr. Khan pointed out that the College offers a certificate in CAD, and that students tend to take the CAD Certificate rather than the Drafting Certificate. Most students concentrate on the CAD and Drafting courses which will help them obtain a job, and then come back to school part-time for the rest of the courses required for the associate degree.

Mr. Sawasky pointed out that the three basic Drafting courses required for the Drafting Certificate are also required for the CAD Certificate. However, MEC 101, Introduction to Manufacturing Processes, and MEC 102, Manufacturing and Fabrication Processes, are not required for the CAD Certificate.

The group asked why those two courses are not required for the CAD Certificate, as they are a fundamental part of the education a student needs to work in the field. Mr. Khan responded that those courses are part of the associate degree program, but it is not possible to include all the courses in the certificate program. He asked whether we should be offering a certificate program in CAD.

Ms. May reported that very few students she has worked with ask about the Drafting Certificate. Students are more interested in the CAD Certificate.

Mr. Barran asked whether a student who has earned the certificate has an advantage in the job market over someone who has simply taken classes for a year in the associate degree program without earning the certificate. Mr. Khan responded that he does not believe the certificate gives a student an advantage. The important thing is to have taken the courses needed to get an entry level position.

Ms. May commented that most students like to have a certificate as a stepping stone, whether or not it is required to get a job. Earning the certificate is more of a personal goal for the student.

Dr. Olivarez asked the group what industry requires an entry level person to have. Mr. Barran responded that the smaller shops still do a lot of manual work and would hire people with less education than the larger companies would require. At Modern Engineering, an associate degree is required. He believes the number of jobs which can be obtained without an associate degree is shrinking. He believes the existence of a certificate program may imply to students that if they earn the certificate, they will be viable in the marketplace, and this is not the case. They may get an entry level job but never be able to advance without more education.

Ms. Margaret McNeal reported that she advises her students to get a certificate and get a job, and then to continue their studies to receive an associate degree. She tells them that many employers are looking for an associate degree now. However, in Tier Three, manual work is still being done. Although a student with the Drafting Certificate would not be marketable in the Big Three or in Tier One, there are other companies who would hire someone with the certificate because they want to train their employees themselves.

Mr. Henry Sommerstorfer commented that in industry, a certificate from a school does not mean a great deal. It simply shows the person has taken classes. ASBE certification is the industry standard.

Ms. May suggested that perhaps the catalog description of the Drafting Certificate Program could say that the certificate may not be enough to enable a person to get a job. However, Mr. Tally pointed out that it may help the student get a job. In reality, the certificates are just breaking the CAD Associate Degree into subsets.

Mr. Khan pointed out that the CAD Certificate has both manual Drafting and CAD classes. If students come with experience in the field, they are allowed to test out of certain classes.

Ms. Kalson asked whether there could be an assessment to receive the certificate.

Dr. Olivarez pointed out that ASBE certification involves levels of competency. He wondered whether it would be possible to come up with competency levels for each class so that a competency certificate could be given, rather than a certificate that shows certain classes were taken. The competencies would need to be set by industry, not the College.

Mr. Sommerstorfer agreed that a certificate would be worth more in the real world of industry if it was linked to competencies.

Mr. Barran commented that it appears most people in the business are not placing a great deal of confidence in a one-year certificate for job entry.

Dr. Olivarez responded that he believes a certificate program should be kept available for students who want to take their studies step by step. However, the program description in the catalog should make it clear that earning the certificate does not guarantee a job. Dr. Olivarez believes that students need to have levels of achievement available to them, especially as most are taking classes part-time.

Ms. May agreed that a short-term goal can help to motivate, but we must be sure not to misinform students by causing them to think the certificate will make them employable.

The group agreed that this problem could be solved by removing the last sentence in the description of the Drafting Certificate Program on page 82 of the catalog: "A graduate may be employed in either a large industrial establishment or a small business drawing parts and products."

Mr. Sawasky pointed out that there is a great deal of duplication between the Drafting and CAD Certificate Programs. Mr. Sommerstorfer suggested that MEC 101 and MEC 102 be added to the CAD Certificate and just have that one certificate available.

Mr. Tally responded that he would not want the certificate to be eliminated, as it is good for people who take courses slowly on a part-time basis. It can serve as an interim step and be a means of rewarding and encouraging students. We need an associate degree program with a certificate representing a subset of its courses which will get students a job. Completion of the degree can help the person achieve a promotion later. What needs to be determined is whether we need both a manual Drafting and a CAD Certificate.

Dr. Olivarez pointed out that we also need to add competency levels which we do not currently have.

Mr. Sawasky commented that we may need to consider requiring certain competencies or courses for entry into associate degree programs which are very long. He cited as an example OCC's nursing program, which has prerequisites, and which also has lots of students. Mr. Sommerstorfer agreed that students should not be required as a part of the program to do courses which are basically remedial.

Mr. Khan responded that we are a community college with an open door policy. We should not lower our standards, but at the same time, we should not have a great many program prerequisites which students must achieve before entering the program. He explained that 62 credits are required for a normal associate degree program. The CAD Body Design Option has 76 credits. In addition, some students must take more elementary math courses to prepare themselves for MAT 154, College Algebra, and this makes their program of studies even longer.

Mr. Barran pointed out that the industry is advancing rapidly, and there is continually more and more to learn. If OCC keeps its program requirements the same, the person graduating will be less prepared, even though the same material is covered. This will mean that the achievement of an associate degree will not prepare students for jobs in the industry.



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Mr. Tally commented that what we need to do is bring students from where they are now to where they want to be in the next step. He believes that a certificate program which represents a subset of the associate degree is the first step to which we must bring students.

Mr. Sawasky pointed out that many students come in with no technical background, while others have advanced education and experience. He asked whether we should be putting them all in the same classes.

Mr. Sommerstorfer suggested that a basic drafting course could be offered as a 0-level class to prepare students for regular college-level classes. This could be taken by students with no background in drafting.

Mr. Sawasky pointed out that students who come in through the Tech Prep Program are not required to take DDT 100, Fundamentals for the Drafting Industry, but we do not have a process in place to recognize work experience so students can get credit for it.

Dr. Olivarez asked whether this could be done through competencies. If students did not meet the competencies, they would need to take remedial classes to prepare them, as the College currently does in English and math.

Mr. Khan pointed out that, for English and math, there is a testing process. There would need to be a test in place to see if students have the drafting skills for the next class or should take a remedial course. Mr. Sommerstorfer commented that a list of necessary basic drafting skills was put together a few years ago. That list could perhaps be used to filter out those who need the remedial class.

Mr. Sawasky mentioned that many who originally say they want to test out of DDT 100 decide they should take it anyway, as a refresher course.

Dr. Olivarez asked the group to try to come to some conclusion as to whether we need a Drafting Certificate. If so, do we need to change the content?

Mr. Sawasky and Dr. Olivarez agreed that DDT 125, Advanced Descriptive Geometry Applications, has been discontinued and should not have appeared in the most recent catalog. Perhaps the paperwork was not completed to remove it from the catalog.

Mr. Sawasky pointed out that most students substitute another course for ELT 101, Applied Electricity.

Mr. Tally stated that the meaning of a drafting certificate should be that students have completed a certain sequence of drafting courses. But only three courses in the current certificate are Drafting courses. He believes that only those three courses and perhaps the MEC courses should be included in the Drafting Certificate. Those would be sufficient to indicate that students understand the manual art of drafting.

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Mr. Khan suggested that such a manual drafting certificate could be the first step, the CAD certificate could be the second, and the associate degree the third step.

Mr. Tally suggested that the manual drafting certificate could be a stepping stone that rewards and encourages the student and gives a sense of accomplishment. He would not like to see it eliminated, but he believes it needs a clear statement that earning the certificate does not mean students will be able to get a job in industry. He believes it would be good for students to have those three levels of achievement on their resume.

Mr. Sawasky read the group the statement he made about the Drafting Program as part of the press release regarding the Drafting Advisory Committee: "The Drafting Program is designed to prepare students to enter OCC's Computer Aided Design and Drafting Program." Mr. Sommerstorfer agreed that we would be safe with that statement.

Mr. Barran asked whether these programs could be listed on the same page or on adjacent pages. Mr. Khan explained that the catalog is arranged alphabetically. Mr. Tally suggested a footnote could tie them together. Mr. Sawasky suggested that the Drafting Certificate could be indicated on the CAD page in the catalog, with a mark other than an asterisk indicating the courses in the Drafting Certificate, while the asterisk indicates those in the CAD Certificate.

Dr. Olivarez commented that this change will be made as soon as he is able to get the paperwork done and through OCC's curriculum process.

### 3. Math Courses

The group discussed whether theoretical or applied math courses should be included in the Drafting curriculum.

The group agreed that math courses should be included in the associate degree program, but not in the Drafting or CAD Certificates. It would be beneficial if these could be applied math courses, but unfortunately, universities do not give transfer credit for those courses.

### 4. Instruction in Visualization and Freehand Sketching

The group discussed how visualization and freehand sketching should be included in the program.

Mr. Sommerstorfer suggested that these skills could be taught by using the many visual aids available in Mr. Sawasky's drafting room. Drawing these parts would be more helpful than just seeing something in a textbook.

Mr. Khan reminded the group that current student Ms. Robin Stewart stated at the last advisory committee meeting that she wished OCC had provided her with the opportunity to make a drawing of an actual part, including measuring it herself and working out a plan for setting up the drawing. Perhaps this kind of experience could be included in DDT 100. There is a need to bring more actual projects from industry to the classroom in both CAD and manual Drafting classes.

#### 5. Possibility of Aptitude Testing

The group suggested that there should be a way to help students realize whether they have the natural ability needed to be successful in the field before they waste years preparing for a career in which they cannot succeed. With an open door policy, we let students in who have no aptitude for the field. They waste their own time, and other students are burdened by these students who need a great deal of extra help in class.

Mr. Tally asked whether the College would be willing to do aptitude testing. Dr. Olivarez responded that, if we had a test that would be defensible in a court of law, it could be done.

Mr. Barran suggested that aptitude testing could be made mandatory. Students would not be required to pass the test to get into the program, but the aptitude test would be used in counseling students. If they do poorly on the test, they could be advised that they have chosen a field that will be hard for them. Dr. Olivarez agreed that perhaps aptitude testing could be done if it was used as an advisement tool.

Mr. Tally pointed out that, when we do not give students an aptitude test and advise them honestly before they enter the program, we are allowing them to fail. This is certainly not what we want to be doing.

Ms. May commented that students having the right to fail is an old community college philosophy. Now we believe students have the right to succeed. We already do ASSET testing in English and math. In English, students are required to take the class they place into, and then advance through the English classes as they are successful in each one. The math assessment is used as a recommendation. Students can still choose to take a class above the level they placed into on the test. Aptitude testing for CAD/Drafting would be no different than what we are already doing in math.

Mr. Sawasky suggested that there could be a test which must be passed in order to enter the CAD/Drafting Program. If students were not able to pass this test, they could take a remedial basic drafting class.

New Advisory Committee Recommendations

11. That competencies determined by industry be linked with each course, so that a competency certificate could be given, rather than a certificate that just shows that certain courses were taken.
12. That the last sentence in the description of the Drafting Certificate Program on page 82 of the catalog be deleted: "A graduate may be employed in either a large industrial establishment or a small business drawing parts and products."
13. That OCC consider testing students for competencies prior to their admission to the CAD/Drafting Program, with those not possessing the necessary competencies being required to take a remedial Drafting course before continuing to more advanced courses.
14. That the Drafting Certificate Program be made up of the following courses:

DDT 100	Fundamentals for the Drafting Industry	3 Credits
DDT 105	Product Drafting	3 Credits
DDT 115	Descriptive Geometry	3 Credits
MEC 101	Introduction to Manufacturing Processes	3 Credits
MEC 102	Manufacturing and Fabrication Processes	3 Credits
15. That the Drafting Certificate Program be linked with the CAD Certificate and the CAD Associate Degree Program by being located on adjacent pages in the catalog or linked by a footnote, or by being indicated on the CAD page in the catalog with a mark other than an asterisk indicating the courses in the Drafting Certificate, while an asterisk indicates those in the CAD Certificate.
16. That OCC consider requiring aptitude testing for students entering the CAD/Drafting Program, the results of this testing to be used for advisement purposes only.

Respectfully submitted,



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