OAKLAND
COMMUNITY
COLLEGE

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COMPUTER HARDWARE ENGINEERING TECHNOLOGY

ADVISORY COMMITTEE MEETING

March 18, 1999

Members Present:

Daniel C. Bednarski, Road Commission of Oakland County
John P. Brooks, N.I.C.E. Inc.
Richard T. Collins, Oakland Technical Center - Northeast Campus
Gary Groce, General Motors
Barry Jocque, OCC Computer Hardware Student
Raymond J. Williams, DaimlerChrysler Corporation

OCC Ex Officio Members Present:

Sharon L. Blackman, Ed.D., Dean of Technology
Patrick Dean, Paraprofessional
Sally Kalson, Coordinator of Cooperative Education
Verna M. Love, Counselor
Dr. Robert Powell, Faculty
Willard Rush, Faculty
Ruth Springer, Secretary

Welcome and Review of Minutes

Dr. Sharon Blackman, OCC's new Dean of Technology, introduced herself and welcomed the group. She invited the members to introduce themselves.

The minutes of the Computer Hardware Engineering Technology Advisory Committee meeting held on October 30, 1997, were reviewed and approved as submitted.

Dr. Blackman invited the group to review the minutes of the follow-up meeting of OCC staff which was held on February 19, 1998. She asked the members to comment on any items which they felt needed to be discussed.

1. **That the College consider setting up an intranet which could be accessed by Computer Hardware students to obtain information and do assigned exercises from home if they wished.**

The group asked whether this recommendation had been completed, and Mr. Patrick Dean responded that it had.

Mr. Willard Rush reported that he is doing something new this semester. He has his own web site which students can access to take quizzes and submit lab assignments. About 20 percent of the students have taken advantage of this thus far. He believes the experiment has been successful enough to continue in the future.

The group asked whether this is done on the honor system, assuming that students are actually doing their own work and turning it in via the Internet. Mr. Rush agreed that there is a slim possibility that someone else could log on under a student's e-mail address and do the assignment for them. Mr. Rush still does testing on campus.

The group asked about recommendation 6 from the Electronics Advisory Committee minutes which was discussed at the last joint advisory committee meeting:

6. **That the College explore the possibility of including a co-op internship as part of the Electronics Technology curriculum.**

Dr. Robert Powell responded that a co-op class, ECT 170, already exists. It has been offered twice in the past, and no one registered for it. However, the course still exists, and could be used if a student was interested in a co-op experience. It could be activated and attached to another course as an independent study class. The faculty do not feel it is necessary to go through the curriculum process to formally make ECT 170 a part of the Electronics Technology curriculum.

Proposed Curriculum Revision

Copies of a proposed curriculum revision were distributed to the group (see attachment). Dr. Blackman explained that the first page shows the current Computer Hardware Engineering Technology curriculum in a sequence that a student could follow to complete the program in two years. The second page shows the revised curriculum which is being proposed. It is being proposed that one credit hour be added to each of the following courses: EEC 102, DC Fundamentals; EEC 104, AC Fundamentals; EEC 105, DC and AC - Circuit Analysis; EEC 127, Basic Electronics; and EEC 135, Digital Logic. Each of these three-credit courses would become four-credit courses. Each of the five courses would have 60 contact hours.

Dr. Blackman explained that she feels it is important to present our curricula in this type of format so students can see how they could complete all their associate degree requirements, including general education courses, within two years if they were able to attend school full-time. She pointed out that ENG 151, Composition I, has been included in the first semester of study. This is to help students get the foundational English skills they will need to be successful in their other classes. OCC students take an average of five to eight years to complete a two-year associate degree program. Students often take their technical courses but not the general education requirements. Then employers tell us their employees don't have the skills they need in such things as communication, problem solving, and teamwork. We know that our students often take a few courses and then stop out. They may work awhile and then come back later to take a few more courses. Many take the technical courses they feel they need but never complete their associate degree. One of the criteria used to evaluate institutional effectiveness is how many students are completing our programs and graduating. The graduation rate for Technology Department programs in general has not been good. Dr. Blackman has asked the faculty to look at their programs to determine whether there are natural stop-out points where students might take a few classes and earn a certificate, then come back to earn another certificate, which would serve as building blocks to achieve the associate degree.

Dr. Blackman asked the group to consider and discuss the following questions: Who are the products of this program? What are we preparing students to do? Are there different levels of skills necessary for various types and levels of work? How can we increase enrollment and increase the number of program completers? We need to think about the competencies for each class and consider whether we are providing the instruction students need in each course. We also need the advisory committee to advise us about the future in this industry and what skills students will need to be employed in the future.

Mr. John Brooks responded that all the advisory committee members represent just a tiny portion of this industry. It is tremendously diverse, and what one branch needs may be the opposite of what another needs. He believes OCC should train students on the basics and then let them become specialized on the particular job they acquire. We need to concentrate on the core electronics curriculum, AC and DC, and then teaching such things as computer repair and microprocessor technology. He believes the curriculum is pretty well structured the way it is now, including a solid core of instructional areas which will be needed by everyone going into the field. If students have a basic understanding of electronics, they should be able to get a job and then move up within the company and become specialized in the particular industry where they are working.

Dr. Blackman pointed out that enrollment is declining in this program and in many of our Technology programs. She asked the group for their ideas on how to attract students to the program.

The group pointed out that the industry is growing fast now and hiring people with less skills. That is why enrollment is down. It was suggested that perhaps a certificate could be offered that included just the electronics core courses. This would document for employers that students have some understanding of electronics. Then they could take the rest of the courses later, perhaps even paid for by the employer. Students each have their own individual goals in taking classes. Some may already be employed and be taking classes to improve their skills. Students just out of high school may take two years at OCC and then move on to a four-year institution. Students may seek employment in companies of varying size and type. We need to find out what these various types of companies expect of our students.

Mr. Barry Jocque commented that he believes part of the reason for the lower enrollment and lack of program graduates has to do with the current curriculum. He stated that he, personally, does not have the degree because he has had a problem with a couple of courses, in particular the Math requirements. He believes that Math requirements could be hindering other students from graduating or discouraging students from entering the program. Mr. Jocque has difficulty seeing the relationship between the MAT 156, Trigonometry, requirement and the work he is doing now with computers.

Dr. Powell agreed that only a small part of the contents of MAT 156 are applicable to the Computer Hardware Engineering Technology Program.

Dr. Blackman pointed out that, when employment is steady, we do not have as many students, so we need to look at other ways to increase enrollment. Also, when we have fewer dollars to work with, programs have to produce in order to get the funds that are available. We need to educate our own internal community to understand that there are at least three possible types of program completers: Marketable skills achievers; competency certificate recipients; and associate degree recipients. Those who receive a competency certificate have a document that shows employers what they can do. We can document those who receive a certificate or degree, because they have completed a specific program of study. It is much more difficult to document the marketable skills achievers as to why they came, who they are, and where they went. We need to find a way to document these students who take only a few classes to meet their personal goals, in order to show how we contribute to the economic development of our community.

Mr. Rush asked for input from the committee on the possibility of doing a trial run during the Fall term of offering some courses in 7 ½ weeks rather than the usual 15-week time frame. Students could take EEC 102 the first 7 ½ weeks by attending class two nights a week, and then take EEC 104 the second 7 ½ weeks. The same content would be covered as in the longer 15-week course. Several group members expressed their belief that this would be a good idea.

Mr. Brooks mentioned that students sometimes become discouraged when they are unable to continue with their prescribed sequence of courses because a prerequisite course was canceled when they needed to take it. Dr. Blackman responded that a packet is being put together for

counselors to use in advising students so they know when each course will be offered in sequence. If they know a particular course will only be offered once a year, they can plan accordingly.

Mr. Brooks suggested that the College offer a continuing education program covering current subject matter which would be of interest to people in the industry. Dr. Blackman agreed, stating that we would need to identify the kinds of courses that would be attractive to industry. We could offer non-credit courses that would allow people to see what we do and might encourage them to come back and take regular courses and possibly complete the degree.

Dr. Blackman called the group's attention to the proposed curriculum revision which had been distributed earlier in the meeting. Mr. Gary Groce asked whether the two-year course sequencing layout could be included in the College Catalog. He suggested that it would be easier for students to make their plans if they could see the progression of courses in the catalog. Dr. Blackman agreed that that would be a good idea.

Dr. Powell asked the group for their input regarding the two Drafting classes which have been included in the curriculum in the past: DDT 100, Fundamentals for the Drafting Industry, and DRT 114, Electronics Drafting. Dr. Powell stated that DRT 114 is only offered during the Spring/Summer term and always conflicts with some other required course. In the past when these courses were put into the curriculum, it was appropriate that they be included because more of our students were hoping to move up into management in the electronics field. However, this no longer seems to be the case. We are asking the committee to advise us as to the applicability of these two courses to this program. If they could be deleted, it would allow us to add one credit hour to the previously mentioned five EEC courses without increasing the total number of credit hours required for the associate degree.

Mr. Brooks agreed that this would be a good idea. If a person was interested in drafting, they could take those classes, but it would not be required of everyone. It would be good to have another credit hour added to the advanced EEC classes, which would allow time to cover more material.

Mr. Jocque stated that he learned a great deal in DRT 114 about circuit boards and the theory behind them. He felt it would be a shame to lose that instruction from the program. He asked whether that content could be included in the other Electronics classes if DRT 114 was deleted from the program.

Dr. Powell responded that they do not currently have time in the EEC courses to teach everything they would like to cover, and there is a need to add more time to those courses. He does not believe that today's students need to take DRT 114. They do get some drafting in the simulation package used in other Electronics courses. If more time was added to those courses, they would be able to use all the material in the simulation package. Dr. Powell does not believe students need the level of drafting taught in DRT 114.

Dr. Powell mentioned that he would also like to eliminate BUS 131, Principles of Supervision, from the Electronics Technology curriculum. He does not believe it is needed by today's students.

Mr. Ray Williams asked whether the Trigonometry class is really necessary for this program. Dr. Powell responded that, with the extra credit hour added to the Electronics courses, they would be able to teach the trigonometry which is needed by students in this program.

Dr. Blackman reported that OCC is in the process of designing a new Manufacturing Technology degree curriculum for the Manufacturing Technology Academy program being undertaken in conjunction with Oakland Schools and under the financial sponsorship of DaimlerChrysler. The team of faculty working on this project includes Math, English, and Physics instructors, as well as faculty from the Technology Department. The team is considering the possibility of integrating academics into technical courses. For example, students might be able to receive Math credit for the math content in an Electronics course. However, there is a whole mind set within the College that would need to change in order to do this.

Mr. Groce responded that that would be a good idea. The College Algebra and Trigonometry courses teach students to think in an abstract and theoretical manner. However, students in technical programs need an emphasis on application rather than theory.

Ms. Verna Love commented that, in the past, technical math courses were included in the Technology programs. However, those courses are not accepted for transfer to four-year institutions, so some curriculum developers have included the standard Math classes in their programs.

Dr. Blackman pointed out that the committee is saying we should take a look at the Math requirements. However, the College's general education requirements for an associate degree include a Math requirement, so we need to stay within those requirements. Dr. Powell responded that we could retain MAT 154, College Algebra, as a part of the curriculum to meet the general education requirement, but delete MAT156, Trigonometry.

At Dr. Powell's request, the group began to vote regarding the proposed curriculum changes.

Mr. Rick Collins made a motion that DDT 100, Fundamentals for the Drafting Industry, and DRT 114, Electronics Drafting, be deleted from the Computer Hardware Engineering Technology curriculum. The motion was seconded by Mr. Williams and approved by the group.

Mr. Brooks made a motion that one credit hour be added to EEC 102, DC Fundamentals, and EEC 104, AC Fundamentals, and that one credit hour and fifteen contact hours be added to EEC 105, DC and AC - Circuit Analysis, EEC 127, Basic Electronics, and EEC 135, Digital Logic.

Each of these five courses would then be four credits and sixty contact hours. Mr. Groce seconded the motion, and it was approved by the group.

Mr. Groce suggested that the group amend the first motion to make clear their intention that the content of DRT 114 which is relevant to this program be included in the appropriate Electronics courses. The group agreed that this was their intent, and there was discussion about the need for such an amendment. The group concluded that it would be clear from the meeting minutes that this was the intention of the recommendation to delete the Drafting courses.

Mr. Williams made a motion that MAT 156, Trigonometry, be deleted from the Computer Hardware Engineering Technology curriculum. Mr. Jocque seconded the motion, and it was approved by the group.

The group asked about the possibility of offering competency certificates which could be subsets of the complete program certificate. Ms. Love referred the group to the Business Information Systems curriculum on page 58 of the College Catalog. After taking four designated courses, students may apply to the discipline for a competency certificate. After taking several more designated courses, they may receive a certificate from the College. The competency certificate is given by the Business Information Systems discipline, not the College, and prepares students for an entry level position.

The group recommended that the College consider offering such competency certificates as part of the Computer Hardware Engineering Technology curriculum. Dr. Blackman and Dr. Powell responded that we would need to first identify the competencies for all courses and then consider what courses might be included in such a certificate and what it would prepare a student to do. OCC staff will need to look at this possibility and bring it back to the committee for their input at a later date.

Mr. Brooks mentioned again that he would like to see OCC pursue the possibility of offering non-credit courses covering new areas that would be of interest to those working in the field.

The group suggested that OCC consider offering courses via distance learning. Perhaps the computer courseware which Dr. Powell has developed could be put on the Internet with certain safeguards. Students might do the majority of their work via the Internet and come to campus to take the midterm and final. This would make it possible to include students who live farther away if they only needed to come to campus a few times to take tests.

Appreciation

Dr. Blackman thanked the group for their service as members of the advisory committee. She presented each member with a certificate of appreciation and a small gift.

Advisory Committee Recommendations

1. That OCC consider offering some Electronics/Computer Hardware Engineering courses on a trial basis during Fall 1999 in a 7 ½-week time frame, so students could take one course the first 7 ½ weeks and another the second 7 ½ weeks.

2. That the College consider offering a continuing education program of non-credit courses covering current subject matter which would be of interest to people in the industry.

3. That the College consider including in the College Catalog the two-year course sequencing layout of the Computer Hardware Engineering Technology Program.

4. That DDT 100, Fundamentals for the Drafting Industry, and DRT 114, Electronics Drafting, be deleted from the Computer Hardware Engineering Technology curriculum.

5. That one credit hour be added to EEC 102, DC Fundamentals, and EEC 104, AC Fundamentals, and that one credit hour and fifteen contact hours be added to EEC 105, DC and AC - Circuit Analysis, EEC 127, Basic Electronics, and EEC 135, Digital Logic. Each of these five courses would then be four credits and sixty contact hours.

6. That MAT 156, Trigonometry, be deleted from the Computer Hardware Engineering Technology curriculum.

7. That OCC consider offering competency certificates which could be subsets of the Computer Hardware Engineering Technology certificate and degree program. These could be competency certificates granted by the discipline, similar to the competency certificate offered by the Business Information Systems discipline.

8. That OCC consider offering Electronics/Computer Hardware Engineering courses via the Internet with students coming to campus only to take tests.

Respectfully submitted,

Ruth Springer

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OAKLAND COMMUNITY COLLEGE

Computer Hardware Engineering Technology (CHT)
Associate in Applied Science

FIRST YEAR

FALL SEMESTER		Credit Hour	Contact Hours
ECT 208	Introduction to Microprocessors	4	60
EEC 102	DC Fundamentals	3	60
CIS 105	Personal Computer Applications	4	60
ENG 151	*Composition I*	*3*	*45*
	Sub-total	14	225
WINTER SEMESTER			
ECT 215	Computer Repair I	4	60
EEC 104	AC Fundamentals	3	60
DDT 100	Fundamentals for Drafting	3	45
ENG 211	*Technical Writing*	*3*	*45*
	Sub-total	13	210
SPRING/SUMMER			
DRT 114	Electronics Drafting	3	45
	Social Science Elective	*3*	*45*
	Physical Education Elective	*1*	*15*
	Sub-total	7	105

SECOND YEAR

FALL SEMESTER			
EEC 105	DC and AC - Circuit Analysis	3	45
EEC 127	Basic Electronics	3	45
EEC 135	Digital Logic	3	45
MAT 154	*College Algebra**	*4*	*60*
	Sub-total	13	195
WINTER SEMESTER			
ECT 216	Computer Repair II	4	60
	Fine Arts/Humanities	*3*	*45*
POL 151	*American Government*	*3*	*45*
	Sub-total	10	150
SPRING/SUMMER			
ELT 207	Advanced Digital Systems	3	45
MAT 156	*Trigonometry **	*3*	*45*
	Social Science Elective	*3*	*45*
	Sub-total	9	135
	GRAND TOTAL	**63* - 66**	**975* - 1020**

Meets General Education Requirements

* Or MAT 163 can be taken in place of MAT 154 and MAT 156.

MAT 163	College Algebra and Trigonometry	4	60

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Computer Hardware Engineering Technology (CHT) - *PROPOSED*
Associate in Applied Science

FIRST YEAR

FALL SEMESTER		**Credit Hour**	**Contact Hours**
ECT 208	Introduction to Microprocessors	4	60
EEC 102	DC Fundamentals	4	60
CIS 105	Personal Computer Applications	4	60
ENG 151	*Composition I*	*3*	*45*
	Sub-total	13	225
WINTER SEMESTER			
ECT 215	Computer Repair I	4	60
EEC 104	AC Fundamentals	4	60
DDT 100	Fundamentals for Drafting	3	45
ENG 211	*Technical Writing*	*3*	*45*
	Sub-total	13	210
SPRING/SUMMER			
DRT 114	Electronics Drafting	3	45
	Social Science Elective	*3*	*45*
	Physical Education Elective	*1*	*15*
	Sub-total	7	105

SECOND YEAR

FALL SEMESTER			
EEC 105	DC and AC - Circuit Analysis	4	60
EEC 127	Basic Electronics	4	60
EEC 135	Digital Logic	4	60
MAT 154	*College Algebra**	*4*	*60*
	Sub-total	16	240
WINTER SEMESTER			
ECT 216	Computer Repair II	4	60
	Fine Arts/Humanities	*3*	*45*
POL 151	*American Government*	*3*	*45*
	Sub-total	10	150
SPRING/SUMMER			
ELT 207	Advanced Digital Systems	3	45
MAT 156	*Trigonometry **	*3*	*45*
	Social Science Elective	*3*	*45*
	Sub-total	9	135
	GRAND TOTAL	**65 - 68**	**1020-1065**

Meets General Education Requirements

* Or MAT 163 can be taken in place of MAT 154 and MAT 156.

MAT 163	College Algebra and Trigonometry	4	60

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