



OAKLAND
COMMUNITY
COLLEGE

Auburn Hills Campus
2900 Featherstone Road, Auburn Hills, MI 48326-2845

(248) 340-6500

Fax: (248) 340-6507

ROBOTICS/AUTOMATED SYSTEMS TECHNOLOGY

ADVISORY COMMITTEE MEETING

September 23, 1997

Present: Sue Barratt, Counselor, OCC
Phil Crockett, Manufacturing & Technological Services, OCC
Bob Lieblang, FANUC Robotics North America Inc.
Dr. Carlos Olivarez, Dean, Academic and Student Services, OCC
Thomas R. Rice, Oakland Technical Center Northeast
Dr. Diann Schindler, Campus President, OCC
Randy Schroeder, FANUC Robotics North America Inc.
John Sefcovic, Paraprofessional, OCC
Ruth Springer, Secretary, OCC
Doug St. Clair, Faculty, OCC

Progress Report on Advisory Committee Recommendations

The minutes of the Robotics/Automated Systems Technology Advisory Committee meeting held on March 24, 1997, were reviewed and approved as written. The minutes of the follow-up meeting of OCC members of the advisory committee held on July 8, 1997, were reviewed, and a progress report was given on each committee recommendation, as follows:

1. That a strong emphasis be placed on the teaching of troubleshooting skills.

This recommendation has been completed and will not appear in future follow-up minutes. Mr. Doug St. Clair and Mr. John Sefcovic explained that troubleshooting skills are taught on an ongoing basis in all classes.

2. That OCC explore the possibility of including a co-op experience in the Robotics Program.

Mr. St. Clair has spoken with Ms. Sally Kalson, Auburn Hills Coordinator of Cooperative Education, about this possibility. He and Ms. Kalson will work together to take through OCC's curriculum process the addition of a co-op class to the Robotics Program as an elective or supportive course.

Mr. St. Clair reported that he was contacted in the spring by someone from FANUC Robotics who was looking for a co-op student. Mr. St. Clair thinks the person may not have understood how OCC's co-op program works. He may have been looking for part-time help, rather than for an actual co-op student. However, FANUC might be a potential co-op site. Perhaps Ms. Kalson could approach FANUC and explain OCC's co-op program to them.

Mr. Bob Lieblang commented that he does not believe FANUC currently has co-op students at the community college level. He said it is important that Ms. Kalson be in contact with the appropriate people in the Personnel Department at FANUC.

3. That OCC explore the possibility of placing equipment from Dynalog, Inc. in the Robotics Lab on a consignment basis.

This recommendation was not approved. Mr. St. Clair and Mr. Sefcovic explained that, if equipment is placed in the lab on a consignment basis, the company can remove the equipment at their discretion. If the same equipment is not used every semester, it creates a gap in the curriculum, since some students receive instruction on that equipment, while others do not. For that reason, it was decided not to pursue this possibility.

4. That OCC attempt to provide some instruction in simulation as a part of the Robotics Program.

Mr. St. Clair reported that a capital equipment request has been approved for better computers which would make it possible to implement computer-based simulation into the Robotics Program. In October, 1997, a Deneb user group will be using simulation software with the robots. This will serve as a test for the feasibility of adding simulation to the curriculum.

5. That instruction in blueprint reading and schematic reading be included in the Robotics Program.

This recommendation has been completed. New instructional material has been developed for ROB 166, Sensor Technology, and ROB 250, Automated Controller Maintenance, which incorporates schematics and basic wiring.

6. That an advanced Programmable Logic Controller (PLC) class be added to the curriculum.

Mr. St. Clair reported that an Advanced PLC class has been developed. It has already been voted upon and approved by Technology Department members. It has been taken to the Campus Curriculum Committee for a first reading. It will have a second reading before that committee on September 24. On October 6, it will go before the College Curriculum Committee. By October 23, it should be approved by the College Curriculum Committee. It could possibly be offered as soon as Winter 1998.

Mr. St. Clair reported that ECT 208, Introduction to Microprocessors, will be deleted from the program, and the new Advanced PLC class will be added in its place.

7. That OCC explore the possibility of adding classes in the repair of personal computers and in C programming to the curriculum.

Mr. Sefcovic reported that the Advanced PLC course will include simple troubleshooting, including such things as identification of computer components, initial set-ups, and simple maintenance techniques.

Mr. Sefcovic explained that structured programming is covered in all Robotics classes. Programming languages are constantly changing. By teaching the robotic aspect of structured programming, students learn what they need to know in this area.

8. That instruction in basic wiring be included in the Robotics Program.

As mentioned under Recommendation 5, new instructional material has been added to two classes which incorporates schematics and basic wiring. Approval has been received from FANUC to use electrical prints on the RJ. They are using RJ schematics out of the maintenance manual.

9. That the material needed by Robotics students in the areas of Pneumatics and Hydraulics be taught in a single class, rather than requiring ATF 140 and ATF 147.

Mr. St. Clair reported that he has spoken with Mr. Tony Hildebrandt, the faculty member responsible for the Fluid Power Program. Mr. Hildebrandt agrees that it would be possible to develop a new course such as this recommendation describes. It would need to be a Robotics class. Substituting a single class for these two would eliminate three credits from the program. There is no hands-on equipment in the Robotics area to teach these subjects. The course could be taught as a theory course, or it could be taught using the equipment in the Fluid Power area. It will be a huge task to

develop such a course and take it through OCC's curriculum process. Mr. St. Clair stated that it will be done at some point in the future, but not right away.

Dr. Carlos Olivarez suggested that, if a new course was developed, perhaps it could be taught in the Fluid Power Lab, or the lab could be used a few times during the semester.

The group agreed that the emphasis of the new course should be on pneumatics.

10. That AC and DC Fundamentals be taught as a single class for the Robotics Program.

14. That EEC 102, DC Fundamentals, and EEC 104, AC Fundamentals, continue to be included as required supportive courses in the Robotics curriculum.

Recommendation 10 was made at the advisory committee meeting held on October 10, 1996. When the recommendation was discussed at the next advisory committee meeting on March 24, 1997, the group recommended that both classes be retained in the Robotics curriculum. Thus, it has been decided that both courses will continue to be included in the program.

Mr. Lieblang emphasized that AC power can be dangerous. If people do not know what they are doing, they can be killed. He feels strongly that the AC class should not be eliminated. Students need instruction in such things as three phase power. It must be taught on the job if students do not learn it here.

Mr. Sefcovic commented that there is a need to explore whether high power safety aspects are emphasized in the course.

11. That OCC explore the possibility of including more instruction in communication skills, including writing, speech, and listening skills, as a part of the Robotics Program.

Dr. Olivarez plans to talk with the instructor who teaches SPE 129, Interpersonal Communication, regarding how to incorporate the content of the technical programs into that class. This needs to be done in both speech and writing classes, so technical students can write and speak about their career area.

Ms. Sue Barratt commented that, in several of the English classes, students are allowed to choose their own topics, so they could choose a topic from their field of study if they wished to do so.

Mr. Randy Schroeder would like to see students receive more training in business communication skills, including good writing and listening skills. He hires people based on their technical skills. Some have needed to go back and get further training in communication skills.

Mr. Lieblang mentioned that, when he took electronics classes, he was required to write reports on experiments as he would need to do in the field. He asked whether this sort of thing is incorporated into the Robotics classes.

Mr. Sefcovic reported that this is not currently done, but it does fit in with the way the program is being revamped. Students are currently given lab assignments to do. If they do a certain number, they receive a grade of C; if they do more, they receive a higher grade. It would be possible to require them to do reports if they want to earn an A.

Mr. Lieblang responded that they should be required to do reports in order to receive a C.

Mr. Sefcovic agreed that this could be done in ROB 250, Automated Controller Maintenance. In that course, students are given problems to troubleshoot. They must then give written feedback as to how they determined how to solve the problem. It would be possible to increase these types of assignments.

Mr. Lieblang stated that everything technicians do on the job involves writing reports. It will be a part of the every-day routine that students will face in the future. He suggested that this type of experience needs to be incorporated into the standard Robotics curriculum as much as possible.

Dr. Diann Schindler commented that we should consider writing across the curriculum. Business keeps telling the College that employees need communication skills in addition to technical skills. She suggested that Technology Department faculty meet with English Department faculty to discuss how technical writing could be incorporated into technical classes. It should be possible to have an English teacher help the Robotics teachers decide on assignments in which writing skills could be incorporated with problem-solving assignments. The College would pay English instructors to help in that way.

Mr. Sefcovic stated that, when students are asked to document programs, they often just give a repeat of the assignment that was given. By working with the English Department, perhaps assignments can be structured to help students learn how to organize what they learn in Robotics and report on it.

Mr. Lieblang commented that he does not see the need for a Trigonometry course in a program designed to train students to work as technicians. Why should students be forced to take trigonometry at the technician level when they will only need it if they go on to earn a four-year engineering degree?

The group suggested that it would be good if students could be required to do presentations in front of the class. Mr. Sefcovic responded that class presentations could possibly be done in ROB 250 and ROB 166.

Dr. Olivarez stated that he will try to invite the English Department Chair to the next advisory committee meeting to discuss the possibility of integrating English and Speech into the technical programs.

Mr. Lieblang stated that he may be able to help with some other methods to help students do more troubleshooting. All the troubleshooting procedures in the RJ manual were written by people in his area. He should be able to get OCC some material so that better troubleshooting exercises can be written. He knows of one breakout box that could be used for that purpose.

12. That tours of area companies be included as a part of the instruction offered in the Robotics Program.

Mr. Randy Schroeder reiterated that the offer is still open for students to tour FANUC Robotics. FANUC's Vice President of Manufacturing likes the idea of tours. They provide an opportunity for students to see what is out there in industry, and a way for FANUC to recruit prospective employees.

Mr. Sefcovic said that Mr. St. Clair will be contacting Mr. Schroeder to arrange a tour for students in ROB 150, Introduction to Robotic Technology.

13. That if material needed by Robotics students in the areas of Pneumatics and Hydraulics is taught in a single class, the primary emphasis of the class be on Pneumatics.

This was covered in the discussion on Recommendation 9.

15. That OCC consider the possibility of deleting one math course from the Robotics Program and adding a course in the repair of personal computers.

It was reported that OCC staff believe that both the required math courses are needed in the program.

Mr. Lieblang asked how much trouble students have with these math courses. Mr. Schroeder responded that he took them, and he believes they should be there. Mr. Phil Crockett stated that he doesn't think most people have a problem with the classes if they take the prerequisites and use the support systems which are available within the College. Dr. Olivarez reported that, across the College, MAT 154, College Algebra, is a course which students have to repeat more often than others in order to pass.

Mr. Crockett suggested that perhaps students who know they do not plan to earn a four-year degree could substitute applied math courses for those listed in the program. Dr. Olivarez asked whether

MAT 115, Intermediate Algebra, might be substituted for MAT 154, or whether the content of MAT 154 was important enough that it should be kept in the program.

Mr. Lieblang stated that he does not see the need for trigonometry at this level.

Mr. Schroeder commented that Intermediate Algebra would provide students with all they would need to be successful in the Electronics classes. He believes trigonometry is important because robots work in 3D space. Students also need trigonometry if they get into Computer Aided Design and milling processes.

Dr. Olivarez suggested that they could invite a math instructor to come in and give an opinion. He believes that this recommendation needs to be considered again.

16. That Robotics students be surveyed to find out what kind of students the program is serving and what their needs and career goals are.

Dr. Olivarez reported that he is working with the Architecture program to finalize a survey of their students. He has not yet prepared a survey for general use by other programs. Perhaps the math question could be addressed in the survey.

Mr. Crockett commented that it is important to address whether students are already working in the field. This would be true for all Technology Department programs.

Mr. Sefcovic mentioned that, at the beginning of each semester, they have students answer questions such as why they took the class and what they are doing now. Mr. St. Clair has several years of those responses. They could help in deciding what questions need to be asked on the proposed survey.

Open Discussion

Mr. Sefcovic asked Mr. Lieblang and Mr. Schroeder whether we are dating ourselves because of the RJ controllers we currently have in the Robotics Lab. They responded that, if you teach the RJ controller properly, you have not dated yourself. The concepts behind the circuitry will remain the same even as more advanced models come out in the future.

Mr. Lieblang asked what kind of assistance OCC may be looking for from the advisory committee that has not yet been asked for. Mr. Sefcovic responded that the breakout boxes Mr. Lieblang mentioned earlier will be very helpful. OCC also needs answers to questions such as he just asked regarding the RJ controllers. We need to know whether we should be attempting to expose students to the newer technologies. Also, how can we facilitate interaction between FANUC and OCC to expose the more advanced students to the newer platforms which are coming out?

Mr. Lieblang stated that he believes OCC should be asking the same questions of all advisory committee members in industry: What is it that I don't know? What is new that we are not aware of? What should I do next in the curriculum? What is going on in the industry that I need to prepare for? OCC needs to use its advisory committees to help keep its programs up-to-date in technology. New curriculum suggestions need to be made a part of the agenda for every advisory committee meeting.

Mr. Sefcovic stated that we need to spend the next advisory committee meeting looking at the technical content of the program. We need to use our program competencies as the basis for advisory committee discussion in an effort to find out whether we have the right competencies and what in the future will necessitate a change in our competencies.

Dr. Olivarez suggested that it would be good if OCC staff could visit FANUC and spend time there, perhaps a couple weeks every year during an off time at the College, in order to see what is going on there.

Mr. Schroeder suggested that OCC staff could go through the training courses at FANUC.

Mr. Schroeder asked whether OCC has a hard time getting people from other companies to attend advisory committee meetings. Mr. Lieblang expressed the belief that the starting time of the meeting makes it difficult for people to attend. He believes that a 5:00 p.m. start time is too early; meetings should begin at 6:00, so people could come after their regular work day.

Mr. Lieblang commented that the College has taken a good step forward by the use of the follow-up minutes to keep track of and report back on what has been done in response to the advisory committee recommendations.

Mr. Tom Rice reported that he has an advisory committee for his high school program. He has to maintain a constant process of recruiting in order to keep getting companies to come in and be a part of the committee. There is always a need for new people on the committee in addition to the current members, in order to have better attendance.

New Advisory Committee Recommendations

17. That report-writing of the type normally done on the job be incorporated into the Robotics curriculum as much as possible.
18. That Robotics students be required to do presentations in front of the class.
19. That a review of competencies and opportunity for new curriculum suggestions be included in the agenda for every advisory committee meeting.

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20. That OCC seek to add representatives of more companies to the Robotics Advisory Committee.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Ruth Springer".

Ruth Springer

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Auburn Hills Campus
2900 Featherstone Road, Auburn Hills, MI 48326-2845

(248) 340-6500

Fax: (248) 340-6507

ROBOTICS/AUTOMATED SYSTEMS TECHNOLOGY

ADVISORY COMMITTEE

Eric R. Anderson
FANUC Robotics North America Inc.
3900 W. Hamlin Rd.
Rochester Hills, MI 48309-3253
248-377-7556

Doug Cicchini
Robotic Production Technology
30545 Stephenson Hwy.
Madison Heights, MI 48071
248-583-2185

Gary L. Clement, Ph.D.
Mail Drop 483-014-201
MFD Pontiac Manufacturing
General Motors Corp.
One Pontiac Plaza
Pontiac, MI 48340
248-857-4490

Bob Lieblang
FANUC Robotics North America Inc.
3900 W. Hamlin Rd.
Rochester Hills, MI 48309-3253
248-377-7443

Marv Long
United Training Services
26211 Central Park Blvd., Suite 500
Southfield, MI 48076
248-352-3620

Lisa A. Moore
Infinite Systems
2285 Opdyke, Suite D
Auburn Hills, MI 48326
248-377-9900

Thomas R. Rice
Oakland Technical Center - NE
1371 N. Perry
Pontiac, MI 48340
248-857-8500

Randy Schroeder
FANUC Robotics North America Inc.
3900 W. Hamlin Rd.
Rochester Hills, MI 48309-3253
248-377-7444

Tom Short
ABB Flexible Automation Inc.
1250 Brown Rd.
Auburn Hills, MI 48326
248-391-8549

Carl Traynor
Dynalog, Inc.
6001 N. Adams Rd., Suite 125
Bloomfield Hills, MI 48304
248-203-9602

OCC Members

Linda Casenhiser
Manufacturing & Technological Services
248-340-6711

Phil Crockett
Manufacturing & Technological Services
248-340-6819

Sally Kalson
Coordinator of Cooperative Education
248-340-6608

Tahir Khan
Chair, Technology Department
248-340-6688

Willie Lloyd
Director of Placement and Cooperative
Education
248-340-6735

Pat May
Counselor
248-340-6560

Dr. Carlos Olivarez
Dean, Academic and Student Services
248-340-6566

Dr. Diann Schindler
Campus President
248-340-6537

John Sefcovic
Paraprofessional
248-340-6685

Ruth Springer
Secretary
248-340-6525

Doug St. Clair
Faculty
248-340-6699

OCC Guests

Dr. David Doidge
Dean, Academic and Student Services
248-471-7707

Martin Orłowski
Director, Institutional Planning & Analysis
248-471-7746

12/15/97
(advw97:rob.lst)