

## **A Department-Wide Distributed Advising System**

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### **ABSTRACT**

In the spring of 1997 the department of chemical engineering at the University of Michigan decided to implement a distributed advising system, wherein the responsibility for advising our undergraduate students would be distributed among the faculty. This paper describes the components of the advising system, training and informational materials developed, and reports on the first semester's implementation.

### **INTRODUCTION**

The department of chemical engineering at the University of Michigan is composed of approximately 450 undergraduate students and 22 faculty members. Prior to the development of the distributed advising system all undergraduate students were advised by a single faculty member. Unfortunately, this system did not allow the faculty member to provide personalized attention to our students, and only the mechanics of course planning could take place. Students were very interested in a system that would allow them to spend more time with their advisor. At the same time, a number of the faculty, who teach undergraduate classes of 150-180 students, were interested in getting to know and mentor a smaller subset of students. It was decided that a distributed advising system which included a large number of faculty members, would best serve the needs of both students and faculty. Some faculty expressed concern, though, as to their lack of familiarity with college rules and the curriculum, which might result in misinformation.

### **INFORMATION ON UNDERGRADUATE ADVISING**

Certain books <sup>1</sup>, World Wide Web sites <sup>2-4</sup>, and articles <sup>5-6</sup> provided much useful background information about advising in general. In addition I made some inquiries as to how other departments within our college, as well as other chemical engineering departments with large undergraduate populations, managed their undergraduate advising. The college's Advising Center had a faculty advising handbook and a first year student handbook that also provided much valuable information.

## ORGANIZATION OF THE ADVISING PROCESS

The department agreed that every faculty member with a greater than 50% appointment in the department would participate fully in the advising of our undergraduate students, with no exceptions. This resulted in an advising load of approximately 28 students per faculty member. In the first year of implementation faculty would be assigned students who were all in the same class (sophomore, junior, senior) and advise these students through graduation, after which they would get a new contingent of sophomores. By assigning students from the same class to a given advisor they would be more likely to have to deal with a smaller number of issues, and only one version of an ever-changing curriculum.

## ADVISOR ASSIGNMENTS

The faculty were assigned to classes in such a way as to ensure that a range of interests were represented in each class' set of advisors. Students were given an 'advisor selection sheet' through which they expressed their area of interest (bio, catalysis, control), and future plans (industry, graduate school, law school, medical school, etc.). We purposely did not allow students to select from a list of faculty assigned to their class, so as to avoid popularity contests.

Faculty also expressed their advising interests. We then did our best to assign students as much as possible to someone whose interests matched theirs, while keeping the advising load equitable between faculty members. E-mail groups were created for each advising group. To help students and faculty to get to know each other student-faculty mixers were organized by our AIChE and NOBCChE (National Organization of Black Chemist and Chemical Engineers) chapters.

## ADVISING HANDBOOK

In order to provide faculty with as much information as possible in an organized form, we assembled advisor handbooks, which included the information described below in a 1" binder. In the binder itself this information was divided into 15 sections, for easy retrieval.

Advising	Tips on advising, gleaned in large part from Panitz <sup>5</sup> Suggestions for meetings with students What to look for: Personal problems and distraught students <sup>6</sup> .
Curriculum	Required program Sample audit sheet (see Figure 1) Sample schedule by term Suggestions for elective courses, divided by area of interest Representative schedule for combined programs with other majors. Courses approved for advanced science credit Description of various math sequences Description of Humanities and Social Science Requirements List of courses approved for Humanities and Social Science credit by the College

Information Frequently asked student questions, regarding such issues as drop/add process, dual degree, pass/fail options, transfer credits  
Academic calendar  
Useful phone numbers and contact information at the department, college and university level.  
Resource Centers/ tutoring information  
Brochures from cooperative education office, office of international programs  
Department and college scholarship and award information  
Financial aid information  
Phone course registration, grade reporting, etc. information  
Services for Students with Disability office Faculty Handbook  
Counseling and Psychological Services Referral Guide for Faculty and Staff  
Information for students who are on probation  
Test anxiety and campus resources  
College of Engineering Honor Code booklet  
University Sexual Assault Policy  
Office of lesbian, Gay, Bisexual and Transgender Affairs information  
FE/PE <sup>7</sup>, GRE, LSAT <sup>8</sup>, MCAT <sup>9</sup>, DAT <sup>10</sup> exam information  
Information on our joint BS/MS programs

NAME JANE STUDENT ID 555-12-1212-3 e-mail jstudent@umich.edu  
 ADDRESS: \_\_\_\_\_ Phone: \_\_\_\_\_ Grad Date May 2000

ChE Courses

Humanities, Soc.Sc., Econ

(ChE)

	Hrs	Grade	Substitutions
230	4	<u>A-</u>	_____
330	4	<u>B+</u>	_____
341	4	<u>B</u>	_____
342	4	<u>C+</u>	_____
343	3	<u>A-</u>	_____
344	4	_____	_____
360	4	_____	_____
460	4	_____	_____
466	3	_____	_____
486	4	_____	_____
487	<u>4</u>	_____	_____
	42		

Courses	Hrs	Grade
Econ.	3/4	<u>A</u>

Humanities: 6 hrs.

<u>ENGL 1X1</u>	<u>AP</u>	<u>3</u>
_____	_____	_____

HU/SS Sequence: 6 hrs. (1 course 300 or above)

<u>AMCUL102</u>	<u>A-</u>	<u>3</u>
<u>AMCUL345</u>	<u>A-</u>	<u>3</u>

Chemistry

Other HU/SS:

130	3	<u>B-</u>	_____
210	4	<u>B</u>	_____
211	1	<u>A+</u>	_____
215	3	<u>B</u>	_____
216	2	<u>A-</u>	_____
261	1	<u>C</u>	_____
302	3	_____	_____
461/463	<u>3</u>	_____	_____
/Adv. Sci.	20		

<u>AFAM426</u>	<u>P</u>	<u>3</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	16	_____

Math, Physics, Engineering Science

Free Electives

Engr 100	4	<u>B</u>	<u>ENGL 125</u>
Engr 101	4	<u>A</u>	<u>ENGR 103</u>
Math 115	4	<u>AP</u>	_____
Math 116	4	<u>A</u>	_____
Math 215	4	<u>A</u>	_____
Math 216	4	<u>B+</u>	_____
Phys 140	4	<u>AP</u>	_____
Phys 141	1	<u>AP</u>	_____
Phys 240	4	<u>B-</u>	_____
Phys 241	1	<u>B</u>	_____
Engr.Elec.	3	_____	_____
Engr.Elec.	<u>3</u>	_____	_____
	40		

<u>FRNCH101</u>	<u>AP</u>	<u>4</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

10 (reduced from 12 because Physics is currently 10-hours)

Total Cr. Hrs 86  
GPA 3.325

**THIS FORM IS NOT AN OFFICIAL UNIVERSITY RECORD. IF YOU NOTICE A DISCREPANCY BETWEEN THE INFORMATION ON YOUR ACADEMIC REPORT AND THIS FORM, PLEASE TELL YOUR ADVISOR OR SANDY SWISHER**

MONTGOMERY

Figure 1. Student audit sheet

## ADVISOR TRAINING

During the summer 1997, and early Fall 1998 all our faculty went through two hours of training, with the primary focus being the curriculum. Prior to these training sessions faculty had received copies of the advising handbook, as well as bulletins for both the College of Engineering and the College of Literature Science and the Arts, where many of the non-engineering courses are taught. While it would have been desirable to spend considerably more time on advising issues, the realities of busy faculty careers had to be considered as well. In the winter term they will receive a refresher the week prior to advising.

## FILE MANAGEMENT

We felt it was important that faculty have access to their advisees' files at all times, so we created duplicate files for all of our students. These files consist primarily of audit sheets and transcripts, as well as any previous advising checklists and advising reports, described below. Advisors were instructed as to the confidentiality of the students' grade information and the corresponding need for security.

## ADVISING CHECKLISTS

The primary concern faculty had going into the advising process was that they would unintentionally misinform students, possibly delaying their graduation. To decrease the chances of this occurring and increase the consistency in advising, advising checklists were developed that walk the advisor through the audit sheet. A sample advising checklist is shown in Figure 2.

## THE ADVISING PERIOD

Advising takes place during the two weeks prior to registration. A week before this faculty are given updated copies of their advisees' transcripts and audit sheets, as well as calendars for the two weeks, with class times for the Chemical Engineering core courses for their class (sophomore, junior, senior) crossed out. Faculty cross out other times they are not available and post the calendars outside their doors. They then e-mail their advising group, asking them to sign up for a half-hour appointment.

During the advising appointment the advisor works through the advising checklist with the student, and provides advice accordingly. Additional advising would take place as needed. Course selections are recorded on the Advising Report Form, shown in Figure 3. Additional details from the advising session, such as courses the student needs to repeat, or reminders that the student is to transfer some course credit from another university or is considering a joint degree program, are also recorded on the sheet. These sheets are signed by both student and advisor. They both keep a copy, with a third copy going to the undergraduate office for the student's permanent files.

We have considered using the World Wide Web and computers in general to record and retrieve student and advising information during the advising sessions, but discussions with faculty members resulted in the decision to use Advising Report forms instead. It was felt that

communications with students would be more comfortable without having to meet around the computer screen. In addition, using a triplicate form made it easier to provide students with a copy of it, rather than have to go possibly to another room to retrieve a printout.

## ChE ADVISING CHECKLIST JUNIORS, FALL 1997

### Review student file:

- \_\_\_ See if there are any prior Advising Report Forms, as a starting point.
- \_\_\_ Look over audit sheet to see what courses student has taken.
- \_\_\_ Look at transcript for an overview of previous course loads, performance, etc.

The student should bring to the meeting an Advising Report Form with their current courses, ideas for what they want to take next term. You'll be editing their selections and advising by working your way down the Audit Sheet. Keep in mind that a nice load is three technical courses and a non-technical course each term.

### Is audit sheet OK?

- \_\_\_ Give student a copy of audit sheet (it's theirs to keep), ask them to check for possible errors while you go through the advising session. Note errors on your copy, give to Sandy Swisher to fix.

### Do any courses have to be repeated?

- \_\_\_ The audit form notes which courses are a prerequisite for another course, with a "+" after the course name, following the same format as the college bulletin. If their grade in one of these courses is less than a C-, they have to repeat it before they take the following course. Only Susan Montgomery can grant exemptions.

### Chemical Engineering Courses:

- \_\_\_ Should already have or be taking: 230, 330, 341, 342, 343, might be taking 486 also.
- \_\_\_ Should plan to take Winter 1998: 344, 360
- \_\_\_ Advise them that they might not get into 360 lab, only 1/2 the class gets in this semester, so they should look for an alternative, maybe an Engineering Elective. If they don't get in Winter term they are guaranteed a place in the Fall. As of now, ChE 360 will not be offered in the Spring term.

### Chemistry:

- \_\_\_ Chemistry, sets of courses they take: 130 (may have been exempt from this), 210/211, 215/216, 261, 302, then 461 or an Advanced Science substitution.
- \_\_\_ Warn them that although Chemistry 261 (prereq for 302) is a 1 credit course, it's actually the first third of Chem 260, meets as a 3 credit course for the first third of the semester, so if they are signed up for 16 credits, it will feel like 18 credits at the beginning of the semester. They can't drop the class after the exam.
- \_\_\_ Students can replace the physical chemistry requirement (461) with an Advanced Science. Advise them that if they are planning on ChE graduate school they should consider taking Physical Chemistry. For suggestions on substitutions, refer student to green "Advanced Science Electives" handout for list of courses that have been previously approved as substitution. You can approve any courses on this list as an advanced science elective, list it on the "Advanced Science Elective" slot in the ChE Advising Report Form. Otherwise, have student check with Susan Montgomery for approval.

### Math, Science, Engineering:

- \_\_\_ Engr. 100 is the Intro to Engineering, replaces the old freshman writing requirement. If they haven't taken it yet they should take English 124 or another freshman composition course.
- \_\_\_ Engr. 101 is the computing course, replaces the Engr. 103,104,105,106 series.
- \_\_\_ Should be done with their math sequence. If they are planning on graduate school, suggest a ChE numerical methods course or advanced math class such as Math 450.
- \_\_\_ Should have Physics 140,141, probably 240, 241. Should plan to take them soon otherwise.

### Engineering Electives:

- \_\_\_ They need at least 6 credits of engineering electives, at the 200 level or higher, and at least one must be outside chemical engineering. AOSS courses do not count as engineering electives.
- \_\_\_ Typical electives include MSE 250, IOE 301, 330, CEE 280, ME 211 or 240. Courses must have enough engineering content to count as engineering electives (e.g. Biomed 295 (seminar) and CEE 400 (contract law), EECS 284, wouldn't count).
- \_\_\_ If they have already taken a ChE course and want to take another one to count as an Engineering Elective, suggest they check if it's crosslisted with another department, and if it is to sign up for it in the other department (e.g. take ChE 412 as MSE 412).

### **Humanities and Social Science:**

- \_\_\_ Check if total credits, including Economics (check Audit Sheet to see if they took that for 3 credits or 4) add up to 16.
- \_\_\_ ChE requires an Economics course, typically Econ 101 is taken. Note that it is a 4 credit course during the school year, a 3 credit course in the summer...
- \_\_\_ At least 6 of their HU/SS credits must be humanities. They can be the same courses they use for their sequence.
- \_\_\_ Make sure whether course they want to take counts as HU or SS. Check the Advising Handbook for definition of what constitutes a HU/SS sequence, and the list of web pages listing whether the course is classified as HU or SS, or check the LSA Course Guide to see how the course is classified. (The web page is more liberal than the LSA Course Guide)

URL for engineering listing (printout in your handbook):

URL for LSA Course Guide:

### Humanities/Social Science Sequence:

- \_\_\_ Check that the courses are within the same department, add up to at least 6 credits, that one of the courses is 300 level or higher. Students can count their required Econ course as part of a sequence. Students can count their freshman writing requirement as part of a sequence, even though the freshman writing requirement itself doesn't count as part of the HU/SS sequence.

### **Free Electives:**

- \_\_\_ Don't get too picky about counting up free electives, the key is that students fulfill all above requirements and have at least 128 credits when they graduate. For suggestions on courses to take for free electives, refer student to blue handout, "UG ChE Elective Opportunities"

### **WRAP UP**

- \_\_\_ Edit the proposed schedule in the Advising Report Form as necessary. Do as much future course planning as the student asks for assuming you have enough time.
- \_\_\_ Check for courses to repeat, advanced science elective chosen (if applicable).
- \_\_\_ Use the "additional notes" to note e.g. Student will double check with Susan Montgomery re. Advanced Science elective, Student plans to go to graduate school in Bioengineering, anything that will help in future planning or that the student has said he/she will do.
- \_\_\_ Sign form, have student sign it too.
- \_\_\_ Keep original, give student yellow copy, return the pink copy to the department, in Sandy's mailbox.
- \_\_\_ Make any additional personal notes for your files.

Figure 2 - Sample advising checklist



### Chemical Engineering Advising Report

**Proposed Schedule - by Term**

**Name** \_\_\_\_\_

FALL ____ Course	Credit hrs	WINTER ____ Course	Credit hrs	Course	Credit hrs
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Total Credits:	_____	Total Credits:	_____	Total Credits:	_____
FALL ____ Course	Credit hrs	WINTER ____ Course	Credit hrs	Course	Credit hrs
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Total Credits:	_____	Total Credits:	_____	Total Credits:	_____
FALL ____ Course	Credit hrs	WINTER ____ Course	Credit hrs	Course	Credit hrs
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Total Credits:	_____	Total Credits:	_____	Total Credits:	_____

**Course(s) student must repeat:** \_\_\_\_\_

**Advanced Science elective:** \_\_\_\_\_

**Additional notes:** \_\_\_\_\_

**NOTE: The student is ultimately responsible for fulfilling all degree requirements.**

**Advisor's signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Student's signature** \_\_\_\_\_ **Date** \_\_\_\_\_

Original: Faculty Advisor

Yellow copy: Student

Pink copy: Department

Figure 3 - Advising Report Form

## IMPLEMENTATION, ASSESSMENT, AND FUTURE PLANS

Students were surveyed following the first advising period Fall 1997 through an e-mail survey. Approximately 20% of each class replied. Table 1 records typical student comments, and Figures 4 through 6 summarize student responses. Overall students seem satisfied with the new system. Some of the concerns involve our inability to match student interest and advisor backgrounds

TABLE 1 - STUDENT OPEN COMMENTS ABOUT THE ADVISING PROCESS

### SOPHOMORES

So far, I like the new advising system. My advisor was able to give me the name and email address of a professor with whom I am doing an independent study. He also made me aware of some technical elective options that I was unfamiliar with.

I'm interested in going into Medicine. I was supposedly grouped with an advisor who had some knowledge of Medical Schools, Admissions procedures. However, my advisor did not know really anything that had to do with medical school.

Teach the faculty members which courses we need to take before sending us to them.

### JUNIORS:

I really like the new advising system. It is very helpful to have an advisor who takes the time to look over your information and help you in making decisions about the next term. I think that the new system works very nicely.

My advisor gave me 40 minutes of her time. That is more time than I have ever received in an advising appt. She was so friendly and genuinely concerned. I think that is critical during our time of big decisions. Thanks so much!

My advisor knew little to nothing about the requirements I need to meet. I basically told him what I have left to take and what I need to graduate. I only hope that I meet all of the requirements when graduation comes along in Dec.

### SENIORS:

I know my advisor was great, but I'm not sure if other students are doing as well with their advisors. One possibility is a training session for all advisors before the advising "season," just to make sure they know the time and energy commitment involved. If this is already happening, then I don't have any other suggestions. Thanks for the new system--it really is much more thorough and helpful!

The new advising program is an excellent idea. The few complaints which I have relate to the fact that this is the first time for everybody. Some of the questions required some research to

answer and I felt a little like I was wasting the professor's time (when I shouldn't.) I'm sure that after a couple of runs, things will go smoother as people learn.

My advisor did not seem very prepared at all to be one. He had no idea what the program requirements were for classes and graduation.

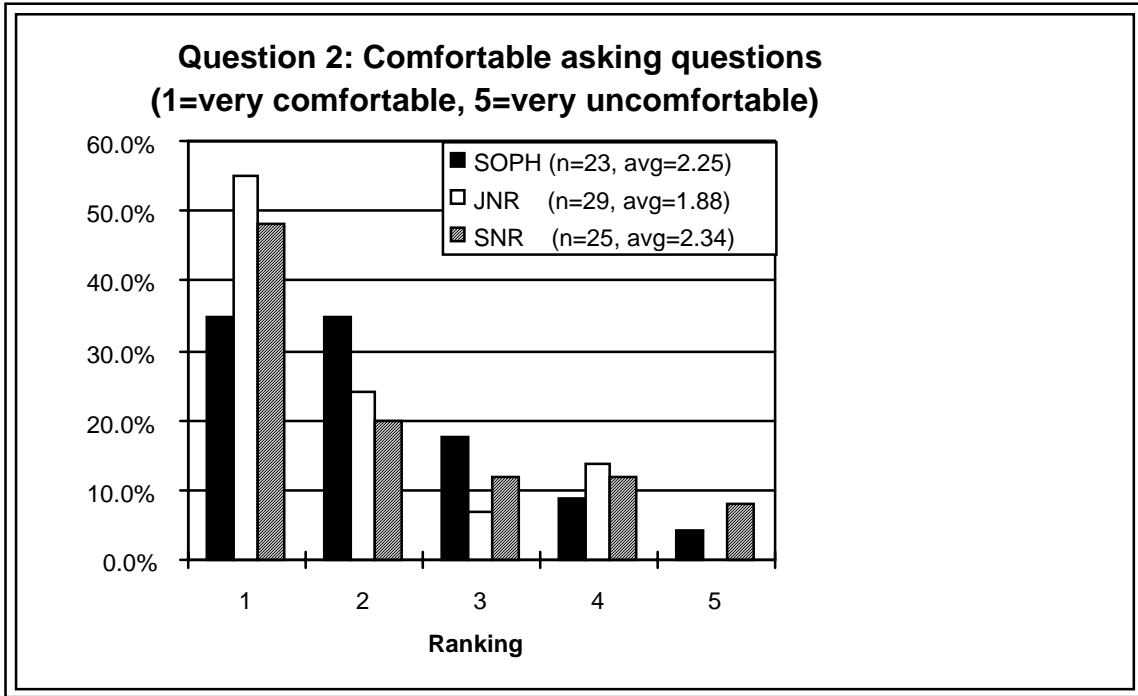


Figure 4. Response to “Were you comfortable asking your advisor questions?” question

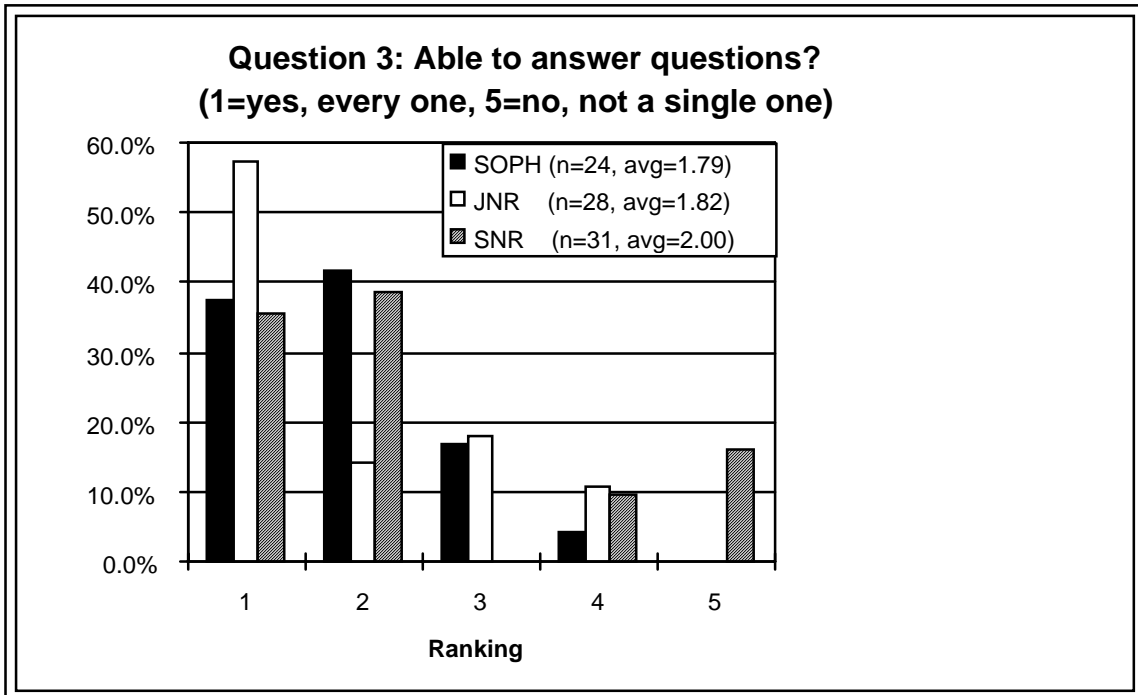


Figure 5. Response to “Was you advisor able to answer your questions, or direct you to a source of information?” question

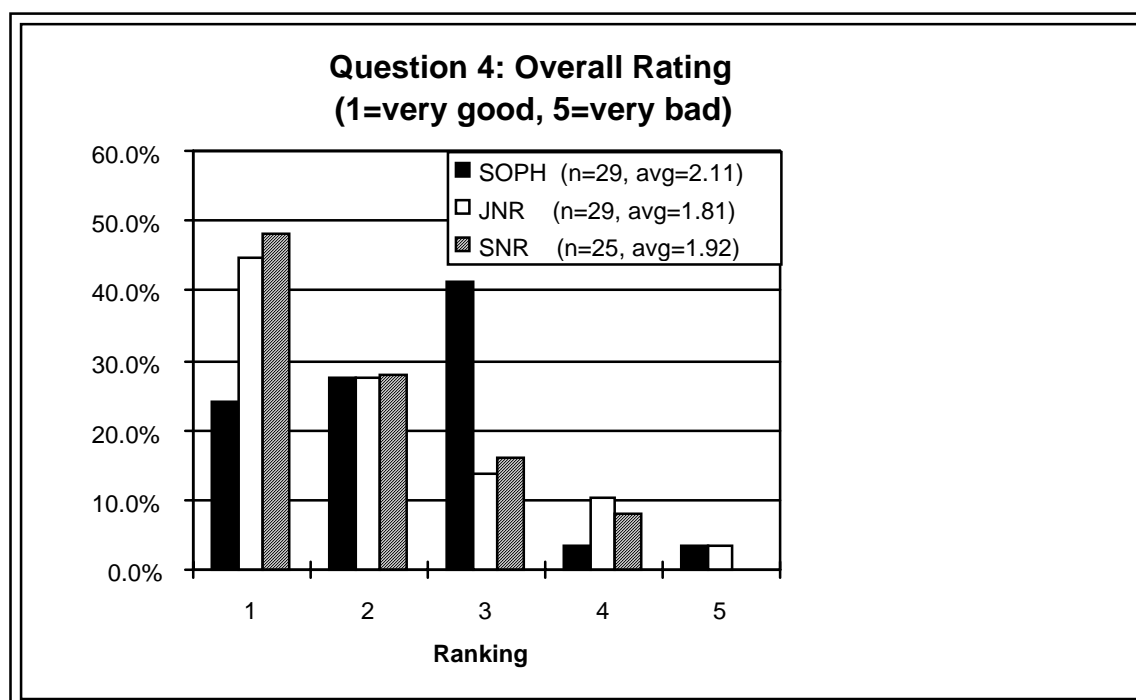


Figure 6. Response to “Overall, how would you rate the advising system?” question

Based on the responses, it appears that, although all faculty went through the training sessions, more needs to be done to ensure that all faculty are familiar with requirements. In many cases, these comments could be attributable to the student being one of the first ones advised by a given professor, as the same professor would often get both unfavorable and favorable comments about the extent of their knowledge.

Future plans include:

- Faculty-specific assessments. For the first student survey we elected to not record professor-specific comments, but in future surveys, when the faculty has had appropriate time to become acquainted with the curriculum, we will be following individual performance more closely, and offering additional training to those who seem to require it.
- Assignment of sophomores in the second semester. We felt it was important that students’ first advising session as chemical engineers be with the head advisor, so that a course plan could be started and to ensure consistency in advising. Having met with the head advisor, some students questioned the need to meet with their assigned faculty advisors. By assigning students in the second semester we hope to be able to assign them early in the term.

- Additional training for faculty, particularly in the future professional schools, such as medical school, law school and business school.
- Use of the World Wide Web in the advising process. Currently students have access to advising information through our Web page, <http://www.engin.umich.edu/dept/cheme/undergrad.html>. We continue to investigate ways to use the Web to improve our process.

## SUMMARY

This paper summarizes our implementation of a department-wide distributed advising system. The key features are an advisor's handbook, training, checklist, and report form. We hope others will find this information useful in implementing or updating their advising systems.

## ACKNOWLEDGEMENTS

The author would like to commend the faculty in the department for their overwhelming support and participation in the advising process. She also thanks Ms. Sandy Swisher, undergraduate student services assistant, for her help in developing and implementing the system, and Ms. Christine Garman for her able clerical assistance.

## REFERENCES

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10. <http://www.ada.org/prac/careers/dat-01.html>

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