

Engineering Department Assessment Report Academic Year 2002-2003

Approved by Department: November 23, 2003

The engineering department has completed this year's assessment activities and analysis. This report includes recommendations for departmental action based on the results and documentation of the assessment process relative to our established program objectives and outcomes. Section I is a summary of department action items and progress on activities addressing those items. Section II (p. 5) presents the departmentally approved action items added to the summary as a result of this year's assessment activities. Section III (p. 6) presents the analysis of 2003 assessment activities, including the outcomes assessment tables showing to what extent the 2002/2003 survey results indicate that we are meeting our program outcomes. Section IV (p. 19) provides results (or summaries of results) of all of the assessment activities that have taken place.

I. Assessment Summary and Progress Report

A. Active Items (see end of table for explanation of source codes)

Source	Item	Priority	Progress	Evidence of Success
AR02	Include surveys of employers or graduate schools in assessment process	1	No activities have begun.	
AR02	Strengthen ME labs by adding modern equipment	1	Spring/02 HVAC lab purchase to be used in spring 04. We are waiting for the college to remodel the SB first floor and basement.	
AR02	Evaluate opening library and EB on Sunday and Fri/Sat evenings	3	Spring/03. Access to the Engineering Building on evenings and weekends was provided for senior design students on a temporary basis.	
AR02	Evaluate eliminating the 17 SH tuition penalty	2	A waiver for our students was obtained for 2002/3 for the computer science course. The administration is looking at eliminating the fee for next year.	
AR02	Make sure students have the ability to use statistics to analyze and interpret data	1	9/01 The math sequence has been changed to include statistics for all students. Fall 2002 students started the new sequence.	
SS01	Outcome (b) requires that graduates have an ability to design and conduct experiments, as well as analyze and interpret data to extract meaning. We decided that students were not as well prepared as they could be to formulate their own experiments and to interpret their data in light of fundamental engineering principles	2	02/03 Physics labs and ENGR 204 labs have been updated.	

SS01	Outcome (f) requires that graduates have an understanding of professional and ethical responsibility from a Christian, holistic perspective. Outcome (j) requires that graduates have engaged contemporary issues demonstrating how their Christian faith relates to their profession. The department agreed that more discussion is needed as to how these outcomes can be addressed more formally in the concentration specific courses.	1	No formal activities have begun.	
AR00	Continue to work on curricular issues with redesign of engineering program.	1	Fall/01 Implementation of the revised program began. Spring/02 The plan received faculty approval. Fall/02 Some new courses are still being designed Spring/03 New courses submitted for approval	
AR00	We need to develop an integrated plan for industry exposure for our students.	3	Fall/02 Freshmen mentoring is now required.	First year student reports indicate that these visits are very valuable

B. Completed Items

Source	Item	Priority	Activities	Evidence of Success	Complete
AR02	Add an oral communication requirement to the new curriculum	1	11/02 The CAS department has agreed to provide two 3 SH interim courses and a two 3 SH courses during the semester. 10/03 The requirement has been approved starting with the class of 2006. Current juniors are highly encouraged to take the course.	The course is an approved part of the curriculum.	11/03
AR02	Present evidence of CEAC participation in program evaluation	1	11/01 Minutes of CEAC meetings are now included in assessment activities	CEAC recommended the addition of a speech course. This item was added to the assessment action item list.	11/01

AR02	Modify the accreditation statement in the college catalog	1	The statement was changed for the 2002 catalog. The assessment committee will monitor all college publications for correct use of the statement.		9/01
AR02	Educate students about the nature of a general BSE degree with concentrations	3	The degree and program mission are shared with students in designated places in the curriculum (in ENGR 101, one sophomore course, and in senior design)	First and second year surveys show 95%+ of students understand the program objectives	11/01
AR01	We need to find ways to improve seminar attendance since it has not improved to desired levels.	2	Seminar requirements were discussed at a Fall, 2002 department meeting. No changes to the current system were made, but faculty were encouraged to find more interesting speakers and promote seminars more heavily. If seminar assessment worsens, this item should come back.	62% of seniors in 2003 graduated with seminar credit (30% in 2002, 43% in 2001). Senior student evaluation of the seminar program has improved.	10/03
AR00	If seminar attendance measures have not improved then we need to address this issue.	2	Item added to agenda in 2001 Cycle.	Too few students graduated with seminar credit	4/01
AR00	Improvement is needed in instructional labs.	1	2001 Several labs have been improved or updated. Specifically we have added a concrete lab, the chemical engineering lab, remodeled the thermal/fluids lab and added some equipment to this lab. This topic reappears in the ABET response.	Senior students assessment of engineering labs has improved	12/01

Source Code:

- AR 03 – Assessment Report of 2003 (Approved November, 2003)
- AR 02 – Assessment Report of 2002 (Approved December, 2002)
- AR 01 – Assessment Report of 2001 (Approved September, 2001)
- AR 00 – Assessment Report of 2000 (Approved April, 2001)
- SS 00 – ABET Self Study of 2001

II. **Actions recommended based on the assessment activities of 2002-2003**

- Develop better advising for grad school

Rationale:

- Only 10% of graduates attended grad school following graduation in 2003
- Senior students were less than satisfied with advising for graduate school (average of 2.7 where 3.0 would be satisfied)

III. Analysis and Evaluation

A. Analysis of 2002/2003 Survey Results

- *Senior surveys.* Curriculum assessment: seniors viewed Chemistry, Computer Science, the Liberal Arts Core, Professional Society Chapters and Engineering Seminars as having less than important value. Abilities and attributes: seniors gave good ratings for all items. Environment/Support Services: seniors were less than satisfied with advising for graduate education and food services.
- *Recent graduates.* Curriculum/Facilities: responses indicated that chemistry, philosophy, and international interims had less than important value. There was some dissatisfaction with engineering laboratories, although not as much as in the past.
- Job offers and interviews were similar to last year.
- Only 10% of students indicated they will be going to grad school.
- 62% of graduating students received seminar credit, a much better number than in the past.

B. Evaluation of 2002/2003 Survey Results against program outcome goals.

The outcomes assessment tables which follow show how this year's survey results meet program goals.

Outcome Assessment Table (a)			
Program Outcome	<i>Graduates have an ability to apply knowledge of mathematics, science, and the engineering sciences as appropriate guidelines for design decision making</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Faculty reviews of senior design projects.	Did this team demonstrate an ability to apply knowledge of mathematics, science, and the engineering sciences as appropriate guidelines for design decision-making?	Answer is yes for all teams.	Y
Assessment questionnaire to seniors	Question: How well do you feel you have been prepared to apply knowledge of mathematics, science, and the engineering sciences as appropriate guidelines for design decision making?	Average response is better than "adequately prepared" (score >3.0)	4.2 Y
	What is your assessment of quality of mathematics instruction?	Average response is better than "satisfied" (score >3.0)	3.3 Y
	What is your assessment of quality of science instruction?		3.8 Y
	What is your assessment of quality of engineering instruction?		4.3 Y
Assessment questionnaire to recent graduates	Question: How well are you prepared to apply knowledge of mathematics, science, and the engineering sciences as appropriate guidelines for design decision making?	Average response is better than "adequately prepared" (score >3.0)	4.1 Y
Assessment questionnaire to 10 year graduates	Question: How well were you prepared to apply knowledge of mathematics, science, and the engineering sciences as appropriate guidelines for design decision making?	Average response is better than "adequately prepared" (score >3.0)	4.4 Y
FE exam results	Pass rate for students taking the exam.	Students pass exam at higher than national rates (81%).	98% Y

Analysis: All targets are met.

Outcome Assessment Table (b)			
Program Outcome	<i>(b) Graduates have an ability to design and conduct experiments, as well as analyze and interpret data to extract meaning</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Assessment questionnaire to seniors	Question: How well do you feel you have been prepared to design and conduct experiments, as well as analyze and interpret data to extract meaning?	Average response is better than "adequately prepared" (score >3.0)	3.9 Y
	Were you satisfied with the physical quality of science laboratories?	Average response is better than "satisfied". (score >3.0)	3.7 Y
	Were you satisfied with the physical quality of engineering laboratories?	Average response is better than "satisfied" (score >3.0)	3.4 Y
Assessment questionnaire to recent graduates	Question: How well are you prepared to design and conduct experiments, as well as analyze and interpret data to extract meaning?	Average response is better than "adequately prepared" (score >3.0)	3.6 Y
	Rate the science laboratories in terms of their adequacy for your professional preparation.	Average response better than "adequate" (score >3.0)	3.2 Y
	Rate the engineering laboratories in terms of their adequacy for your professional preparation.	Average response better than "adequate" (score >3.0)	2.9 X
Assessment questionnaire to 10 year graduates	Question: How well were you prepared to design and conduct experiments, as well as analyze and interpret data to extract meaning?	Average response is better than "adequately prepared" (score >3.0)	4.0 Y

Analysis: All targets are met except for engineering lab quality. Current seniors are OK but recent grads express concern.

Outcome Assessment Table (c)			
Program Outcome	<i>Graduates have an ability to design a system, component, or process to meet desired needs and to produce a prototype or model which can effectively test the basic principles of the design</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Faculty reviews of senior design projects.	Question: Did this team demonstrate an ability to design a system, component, or process to meet desired needs and to produce a prototype or model, which can effectively test the basic principles of the design?	Answer is yes for 90% of teams.	Y
Assessment questionnaire to seniors	Question: How well do you feel you have been prepared to design a system, component, or process to meet desired needs and to produce a prototype or model which can effectively test the basic principles of the design?	Average response is better than “adequately prepared” (score >3.5)	3.8 Y
	Were you satisfied with the quality of engineering design facilities?	Average response is better than “satisfied” (score >3.0)	4.0 Y
	What is your assessment of Senior Design?	Average response is that the value for engineering is better than “important” (score 1 > 3.0) and that there is “adequate” emphasis in the program (1.5 < score 2 > 2.5).	4.6 Y 2.0 Y
Assessment questionnaire to recent graduates	Question: How well are you prepared to design a system, component, or process to meet desired needs and to produce a prototype or model, which can effectively test the basic principles of the design?	Average response is better than “adequately prepared” (score >3.0)	3.3 Y
	Rate the engineering design facilities in terms of their adequacy for your professional preparation.	Average response better than “adequate” (score >3.0)	3.6 Y
	What is your assessment of Senior Design?	Average response is that the value for engineering is better than “important” (score 1 > 3.0) and that there is “adequate” emphasis in the program (1.5 < score 2 > 2.5).	4.1 Y 1.9 Y
Assessment questionnaire to 10 year graduates	Question: How well were you prepared to design a system, component, or process to meet desired needs and to produce a prototype or model, which can effectively test the basic principles of the design?	Average response is better than “adequately prepared” (score >3.0)	3.8 Y

Analysis: All targets are met.

Outcome Assessment Table (d)			
Program Outcome	<i>Graduates have an ability to function on multi-disciplinary teams</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Faculty reviews of senior design projects.	Question: Did this team demonstrate an ability to function on multi-disciplinary teams?	Answer is yes for all teams.	Y
Assessment questionnaire to seniors	Question: How well do you feel you have been prepared to function on a multi-disciplinary team?	Average response is better than “adequately prepared” (score >3.0)	4.1 Y
Assessment questionnaire to recent graduates	Question: How well are you prepared to function on a multi-disciplinary team?	Average response is better than “adequately prepared” (score >3.0)	3.9 Y
Assessment questionnaire to 10 year graduates	Question: How well were you prepared to function on a multi-disciplinary team?	Average response is better than “adequately prepared” (score >3.0)	4.1 Y

Analysis: All targets are met.

Outcome Assessment Table (e)			
Program Outcome	<i>Graduates have an ability to identify, formulate, and solve engineering problems using fundamental principles</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Assessment questionnaire to seniors	Question: How well do you feel you have been prepared to identify, formulate, and solve engineering problems using fundamental principles?	Average response is better than “adequately prepared” (score >3.0)	4.1 Y
	What is your assessment of common engineering core?	Average response is that the value for engineering is better than “important” (score 1 > 3.0) and that there is “adequate” emphasis in the program (1.5 < score 2 > 2.5).	3.8 Y 2.0 Y
Assessment questionnaire to recent graduates	Question: How well are you prepared to identify, formulate, and solve engineering problems using fundamental principles?	Average response is better than “adequately prepared” (score >3.0)	4.1 Y
	What is your assessment of common engineering core?	Average response is that the value for engineering is better than “important” (score 1 > 3.0) and that there is “adequate” emphasis in the program (1.5 < score 2 > 2.5).	3.9 Y 2.0 Y
Assessment questionnaire to 10 year graduates	Question: How well were you prepared identify, formulate, and solve engineering problems using fundamental principles?	Average response is better than “adequately prepared” (score >3.0)	4.3 Y

Analysis: All targets are met.

Outcome Assessment Table (f)			
Program Outcome	<i>Graduates have an understanding of professional and ethical responsibility from a Christian, holistic perspective</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Faculty reviews of senior design projects.	Did this team demonstrate an understanding of professional and ethical responsibility from a Christian, holistic perspective?	Answer is yes for all teams.	Y
Assessment questionnaire to seniors	Question: How well do you feel you have been prepared to understand professional and ethical responsibility from a Christian, holistic perspective?	Average response is better than “adequately prepared” (score >3.0)	4.3 Y
	What is your assessment of the Liberal Arts Core?	Average response is that the value for engineering is better than “important” (score 1 > 3.0) and that there is “adequate” emphasis in the program (1.5 < score 2 > 2.5).	2.8 X 2.1 Y
Assessment questionnaire to recent graduates	Question: How well are you prepared to understand professional and ethical responsibility from a Christian, holistic perspective?	Average response is better than “adequately prepared” (score >3.0)	4.0 Y
	What is your assessment of Philosophy instruction?	Average response is that the value for engineering is better than “important” (score 1 > 3.0) and that there is “adequate” emphasis in the program (1.5 < score 2 > 2.5).	2.4 X 2.3 Y
	What is your assessment of the “Liberal Arts Core”?	Average response is that the value for engineering is better than “important” (score 1 > 3.0) and that there is “adequate” emphasis in the program (1.5 < score 2 > 2.5).	3.3 Y 1.9 Y
Assessment questionnaire to 10 year graduates	Question: How well were you prepared understand professional and ethical responsibility from a Christian, holistic perspective?	Average response is better than “adequately prepared” (score >3.0)	4.3 Y

Analysis: Most targets are met. Seniors undervalue the Liberal Arts Core. Recent grads adequately value the Liberal Arts Core but not philosophy instruction.

Outcome Assessment Table (g)			
Program Outcome	<i>Graduates have an ability to communicate truthfully and effectively</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Faculty reviews of senior design projects.	Did this team demonstrate an ability to communicate truthfully and effectively?	Answer is yes for all teams.	Y
Assessment questionnaire to seniors	Question: How well do you feel you have been prepared to communicate truthfully and effectively?	Average response is better than "adequately prepared" (score >3.0)	4.5 Y
	Question: How well do you feel you have been prepared to communicate orally?	Average response is better than "adequately prepared" (score >3.0)	4.0 Y
	Question: How well do you feel you have been prepared to communicate in writing?	Average response is better than "adequately prepared" (score >3.0)	3.9 Y
	What is your assessment of technical writing?	Average response is that the value for engineering is better than "important" (score 1 > 3.0) and that there is "adequate" emphasis in the program (1.5 < score 2 > 2.5).	3.8 Y 1.9 Y
Assessment questionnaire to recent graduates	Question: How well are you prepared to communicate truthfully and effectively?	Average response is better than "adequately prepared" (score >3.0)	4.1 Y
	Question: How well do you feel you have been prepared to communicate orally?	Average response is better than "adequately prepared" (score >3.0)	3.5 Y
	Question: How well do you feel you have been prepared to communicate in writing?	Average response is better than "adequately prepared" (score >3.0)	3.7 Y
	What is your assessment of technical writing?	Average response is that the value for engineering is better than "important" (score 1 > 3.0) and that there is "adequate" emphasis in the program (1.5 < score 2 > 2.5).	4.1 Y 1.6 Y
Assessment questionnaire to 10 year graduates	Question: How well were you prepared communicate truthfully and effectively?	Average response is better than "adequately prepared" (score >3.0)	4.4 Y
	Question: How well do you feel you have been prepared to communicate orally?	Average response is better than "adequately prepared" (score >3.0)	3.9 Y
	Question: How well do you feel you have been prepared to communicate in writing?	Average response is better than "adequately prepared" (score >3.0)	4.1 Y
Outside grading of lab reports.	Engineering juniors received technical writing instruction and were graded by technical writing professional.	At least 90% pass on the first try.	100% Y

Analysis: All targets are met.

Outcome Assessment Table (h)			
Program Outcome	<i>Graduates have the broad education necessary to understand the impact of engineering solutions in a global and societal context including an understanding of Christian stewardship of resources</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Faculty reviews of senior design projects.	Did this team demonstrate the broad education necessary to understand the impact of engineering solutions in a global and societal context including an understanding of Christian stewardship of resources?	Answer is yes for all teams.	Y
Assessment questionnaire to seniors	Question: How well do you feel you have been prepared to understand the impact of engineering solutions in a global and societal context including an understanding of Christian stewardship of resources?	Average response is better than "adequately prepared" (score >3.0)	4.1 Y
	What is your assessment of the liberal arts core?	Average response is that the value for engineering is better than "important" (score 1 > 3.0) and that there is "adequate" emphasis in the program (1.5 < score 2 > 2.5).	2.8 X 2.1 Y
Assessment questionnaire to recent graduates	Question: How well are you prepared to understand the impact of engineering solutions in a global and societal context including an understanding of Christian stewardship of resources?	Average response is better than "adequately prepared" (score >3.0)	3.8 Y
	What is your assessment of the liberal arts core?	Average response is that the value for engineering is better than "important" (score 1 > 3.0) and that there is "adequate" emphasis in the program (1.5 < score 2 > 2.5).	3.3 Y 1.9 Y
Assessment questionnaire to 10 year graduates	Question: How well were you prepared understand the impact of engineering solutions in a global and societal context including an understanding of Christian stewardship of resources?	Average response is better than "adequately prepared" (score >3.0)	3.7 Y
International degree designation	Number of students receiving the international degree designation	No target set at this time	1 out of 55

Analysis: Most targets are met. Current graduates do not completely appreciate the importance of the liberal arts core (although 3-year out grads do).

Outcome Assessment Table (i)			
Program Outcome	<i>Graduates have a recognition of the need for, and an ability to engage in life-long learning, to aid in the fulfillment of their calling</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Faculty reviews of senior design projects.	Did this team successfully meet its intended goal?	Answer is yes for all teams.	Y
Assessment questionnaire to seniors	Question: To what level do you agree with the following statement about yourself: I have a recognition of the need for life-long learning, to aid in the fulfillment of my calling?	Average response is better than "agree" (score >3.0)	3.4 Y
	What is your assessment of engineering seminars?	Average response is that the value for engineering is better than "important" (score 1 > 3.0) and that there is "adequate" emphasis in the program (1.5 < score 2 > 2.5).	2.9 X 2.1 Y
	Did you have an engineering internship experience?	At least 80% answer yes.	83% Y
Assessment questionnaire to recent graduates	What professional learning activities have you participated in since graduation?	At least 60% report some activity.	94% Y
	What is your assessment of engineering seminars?	Average response is that the value for engineering is better than "important" (score 1 > 3.0) and that there is "adequate" emphasis in the program (1.5 < score 2 > 2.5).	3.1 Y 2.0 Y
Assessment questionnaire to 10 year graduates	Give the approximate number of professional learning activities you have participated in since graduation.	At least 80% report activities.	96% Y
	Did you complete a graduate degree?	At least 30% with graduate degrees.	50% Y
	Have you received patents? published any peer-reviewed journal or conference papers? published any engineering related books?	At least 20% with activities in these areas.	27% Y
Seminar attendance	Percentage of students graduating with Engr 294 or 394 credits.	Minimum of 50%	62% Y

Analysis: Nearly all targets are met. The assessment of engineering seminars and the number of students with seminar credit has improved.

Outcome Assessment Table (j)			
Program Outcome	<i>Graduates have engaged contemporary issues demonstrating how their Christian faith relates to their profession</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Assessment questionnaire to seniors	Question: To what level do you agree with the following statement about yourself: I have engaged contemporary issues in a way that allows me to demonstrate how my Christian faith relates to my profession?	Average response is better than “agree” (score >3.0)	3.1 Y
	What is your assessment of the integration of faith throughout the engineering program?	Average response is that the value for engineering is better than “important” (score 1 > 3.0) and that there is “adequate” emphasis in the program (1.5 < score 2 > 2.5).	4.2 Y 1.8 Y
Assessment of recent graduates.	What is your assessment of the integration of faith throughout the engineering program?	Average response is that the value for engineering is better than “important” (score 1 > 3.0) and that there is “adequate” emphasis in the program (1.5 < score 2 > 2.5).	4.2 Y 1.8 Y

Analysis: All targets are met.

Outcome Assessment Table (k)			
Program Outcome	<i>Graduates have an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice to develop responsible technologies</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Faculty Course Assessments	Faculty prepare assessment report for every course based on own and student input.	None. Goal is continuous improvement of the course.	---
Assessment questionnaire to seniors	Question: How well do you feel you have been prepared to use the techniques, skills, and modern engineering tools necessary for engineering practice to develop responsible technologies?	Average response is better than "adequately prepared" (score >3.0)	4.1 Y
	Indicate your satisfaction with the quality of the Engineering Department computing facilities.	Average response is better than "satisfied" (score >3.0)	3.6 Y
	Indicate your satisfaction with the quality of the college computing facilities.	Average response is better than "satisfied" (score >3.0)	3.3 Y
Assessment questionnaire to recent graduates	Question: How well are you prepared to use the techniques, skills, and modern engineering tools necessary for engineering practice to develop responsible technologies?	Average response is better than "adequately prepared" (score >3.0)	3.4 Y
	Rate the computing facilities in terms of their adequacy for your professional preparation.	Average response better than "adequate" (score >3.0)	3.8 Y
Assessment questionnaire to 10 year graduates	Question: How well were you prepared use the techniques, skills, and modern engineering tools necessary for engineering practice to develop responsible technologies?	Average response is better than "adequately prepared" (score >3.0)	3.5 Y

Analysis: All targets are met.

Outcome Assessment Table (I)			
Program Outcome	<i>Graduates have significant exposure to the engineering profession</i>		
Assessment Tool	Specific Assessment Activity	Performance Target	Results
Assessment questionnaire to seniors	Question: To what level do you agree with the following statement about yourself: I have had significant exposure to the engineering profession?	Average response is better than "agree" (score >3.0)	3.2 Y
	Did you have an engineering internship experience?	At least 80% answer yes.	83% Y
	What is your assessment of the mentoring program?	Average response is that the value for engineering is better than "important" (score 1 > 3.0) and that there is "adequate" emphasis in the program (1.5 < score 2 > 2.5).	3.0 Y 1.6 Y
	What is your assessment of the internship program?	Average response is that the value for engineering is better than "important" (score 1 > 3.0) and that there is "adequate" emphasis in the program (1.5 < score 2 > 2.5).	4.5 Y 2.1 Y
Seminar attendance	Percentage of students graduating with Engr 294 or 394 credits.	Minimum of 50%	62% Y

Analysis: All targets are met

IV. Assessment Results Summary

A. Assessment results

- Professional Writing Program Results. Professional technical writers reviewed laboratory reports of junior engineering students. The reports were scored on a 40-point scale with a passing score defined as 26 or above. This was done for one report each in Engineering 320, 330, 332, and 382. **Of the 69 students graded in the exercise 0 failed.** The average score was 35.9, the median score was 36.5, and the low score was 28.5.
- Seminar attendance – the target is that at least 50% of our students graduate with Engr 294 or 394 credits. The data for 2003 is **34 students out of 55 (62%)** graduated with 294 or 394 credit.
- Faculty assessment of courses. Fall, 2002: Assessments submitted for 11 out of 17 courses (65%). Interim, 2003: Assessments submitted for 3 out of 5 courses (60%). Spring, 2003: Assessments submitted for 17 out of 21 courses (81%).

B. Summary of attachments. The following attachments are the results of or provide a summary of the assessment activities that have taken place in 2002/2003.

- Summary of Senior Surveys – starting on page 20
- Senior job placement survey summary – page 25
- Senior graduate school placement results – page 26
- October 2002 and Spring 2003 FE exam results summary – page 27
- Results of surveys sent to graduates from 1993 – starting on page 28
- Results of surveys sent to graduates from 2000 - starting on page 33
- Results of First year surveys – starting on page 37
- Results of Second year surveys – starting on page 39
- Minutes of November, 2002 and March, 2003 CEAC meetings – page 42

Engineering Senior Survey – Spring 2003 Results

I. General Information: 60 students participated

Your name (OPTIONAL) 29 gave names

Engineering Concentration: Electrical & Computer: 11, Chemical: 5, Civil: 24, Mechanical: 20

Did you transfer into engineering at Calvin from another school? Yes: 5, No: 55

Did you switch into engineering from another program at Calvin? Yes: 4, No: 55

When did you start college? September 1999: 48, September 1998: 7, Other: 5

When will you complete your degree requirements?

May 2003 or Summer 2003: 55, December 2002: 4, Other: 1

Number of years to complete college: 55 out of 60 (92%) completed in 4 years (including summer).

Did you have an engineering Internship experience? Yes: 50, No: 10

Did you work an engineering related job during your senior year? Yes: 27, No: 33

If "Y" how many hours per week did you average? 8.3

Approximate Overall GPA: 3.0

2. Career Plans

What options did you consider (or are you considering) for the next step in your career?

Engineering job: 37, Graduate School, 5: Both 15, Other: 3

Have you accepted a job? Yes: 31, No: 28, If Yes, when did you receive the offer: Average March

Are you going to graduate or professional school next fall? Yes: 9, No: 46, Uncertain: 4

3. Assessment of the engineering curriculum

	Emphasis in Program				Value for Engineering					
	too much	adequate	too little	ave	extremely imp	very imp	imp	somewhat imp	not imp	ave
A. Basic Subjects	3	2	1		5	4	3	2	1	
Mathematics	7	51	2	2.1	20	29	10	1	0	4.1
Physics	4	49	6	2.0	10	30	14	5	0	3.8
Chemistry	4	49	5	2.0	6	7	23	21	1	2.9
Computer Science	4	33	15	1.8	4	15	17	15	5	2.9
English 101	2	52	5	1.9	8	17	28	6	0	3.5
CAS 100	3	45	7	1.9	11	15	24	3	2	3.5
Liberal Arts Core	8	49	1	2.1	2	8	23	24	1	2.8
Bus 357	5	38	13	1.9	9	16	22	9	0	3.4
B. Engineering Subjects										
Engineering 101	5	52	3	2.0	4	13	28	13	2	3.1
Engineering 101 lab	3	44	13	1.8	6	14	29	9	2	3.2
Engineering 102	4	55	1	2.1	5	10	29	15	1	3.1
Common engineering core (205, 202, 204, 319)	1	57	2	2.0	10	30	18	2	0	3.8

	Emphasis in Program				Value for Engineering						
	too much	adequate	too little	ave	extremely imp	very imp	imp	somewhat imp	not imp	ave	
Concentration specific courses	3	2	1	1.8	5	4	3	2	1	4.5	
Senior Design	0	47	12	2.0	38	15	6	0	0	4.6	
Senior Interim	3	54	2	2.0	44	10	4	1	0	3.5	
	3	47	5	2.0	10	14	27	4	0		
C. Other program components											
Technical writing	2	50	8	1.9	10	27	21	2	0	3.8	
Professional Society student Chapters (ASCE, ASME, and IEEE)	2	26	30	1.5	3	10	29	13	3	2.9	
Integration of Christian faith throughout Engineering program	1	48	10	1.8	26	21	9	3	0	4.2	
D. Optional program components											
Freshman Mentoring	2	7	10	1.6	3	2	8	4	2	3.0	
Internship Program	8	36	3	2.1	32	9	5	1	0	4.5	
Engineering Seminars	7	35	4	2.1	0	11	19	15	1	2.9	
International Interims	4	11	3	2.1	2	5	5	4	2	3.1	

4. Assessment of abilities and attributes

How well do you feel you have been prepared:	Ave	Level of Preparation				
		very well prepared	well prepared	adequately prepared	partially prepared	poorly prepared
		5	4	3	2	1
To apply knowledge of mathematics, science, and the engineering sciences as appropriate guidelines for design decision making?	4.2	21	32	6	1	0
To design and conduct experiments, as well as analyze and interpret data to extract meaning?	3.9	13	29	16	1	1
To design a system, component, or process to meet desired needs and to produce a prototype or model which can effectively test the basic principles of the design?	3.8	14	26	16	4	0
To function on a multi-disciplinary team?	4.1	22	22	10	4	0
To identify, formulate, and solve engineering problems using fundamental principles?	4.1	17	32	11	0	0
To communicate truthfully and effectively?	4.5	35	16	8	0	0
To communicate orally?	4.0	18	25	16	1	0
To communicate in writing?	3.9	16	26	16	2	0
To use the techniques, skills, and modern engineering tools necessary for engineering practice to develop responsible technologies?	4.1	18	31	9	2	0
To understand professional and ethical responsibility from a Christian, holistic perspective?	4.3	28	22	9	0	1
To understand the impact of engineering solutions in a global and societal context including an understanding of Christian stewardship of resources?	4.1	23	21	14	1	0

To what level do you agree with the following statements about yourself:	ave	Level of Agreement				
		strongly agree	agree	disagree	strongly disagree	Neutral/ Not Sure
		4	3	2	1	0
I have a recognition of the need for life-long learning, to aid in the fulfillment of my calling.	3.4	27	26	6	0	1
I have had significant exposure to the engineering profession.	3.3	18	37	1	1	3
I have engaged contemporary issues in a way that allows me to demonstrate how my Christian faith relates to my profession.	3.1	8	42	4	0	6

5. Assessment of the Environment of Learning

	Ave	Extremely Satisfied	Very Satisfied	Satisfied	Somewhat Satisfied	Not Satisfied	No Opin
A. Quality of instruction and support for learning by the faculty in:							
Mathematics	3.3	9	17	23	6	5	0
Sciences	3.8	9	29	20	2	0	0
Computer science	3.0	6	12	23	13	5	1
Humanities & social sciences	3.3	5	17	28	9	0	1
Engineering	4.3	22	32	5	1	0	0
B. Quality of advising or counseling with respect to:							
Academic planning	3.3	8	15	28	7	2	0
Career planning	3.1	7	12	26	11	4	0
Graduate education	2.7	4	4	19	14	5	11
Christian faith	3.4	12	15	20	9	2	2
C. Equity of treatment by:							
Academic administrators	3.4	9	16	26	6	1	2
Faculty	3.5	10	18	26	2	3	1
Staff	3.8	15	17	25	2	0	1
Fellow students	3.7	13	17	26	2	0	1
D. Quality of the following facilities:							
Computing (Engineering Dept.)	3.6	14	25	8	9	4	0
Computing (college)	3.3	6	21	22	7	3	1
Classrooms	3.4	7	20	25	8	0	0
Campus	4.1	20	27	11	1	0	0
Science laboratories	3.7	10	24	23	3	0	0
Engineering laboratories	3.4	8	23	14	10	4	0
Engineering design/project facilities	4.0	23	21	12	3	1	0
Library	3.7	11	18	20	3	0	7
Study/meeting rooms	3.4	7	15	29	6	0	3

6. Assessment of Support Services

	ave	extremely Satisfied 5	Very Satisfied 4	Satisfied 3	Somewhat Satisfied 2	Not Satisfied 1	No Opinion
A. Academic and Financial Services:							
Admissions	3.3	7	5	37	1	1	9
Bookstore	3.0	4	7	38	5	4	2
Career Services	3.2	5	11	30	10	0	3
Financial Aid	3.1	5	7	29	13	0	6
Library	3.4	7	8	33	3	0	9
Registrar	3.2	5	13	30	10	0	2
Student Academic Services	3.4	5	7	18	2	0	26
B. Administrative Offices							
Engineering Department office	3.9	16	21	19	2	0	2
Dean's Office	3.3	3	3	15	3	0	36
President's Office/Provost's Office	3.2	2	5	16	3	0	33
Student Life Office	3.2	3	7	16	4	1	29
College Chaplains office	3.1	1	3	18	2	0	36
C. Other Services							
Campus worship	3.4	8	16	23	2	5	6
Food Services	2.6	3	9	18	20	8	2
Health Services	3.2	5	11	22	8	1	12
Service Learning Center	3.3	4	5	17	3	0	30
Broene Counseling Center	3.3	3	2	17	1	0	36
Housing Office	3.1	5	7	18	8	2	19
Recreation and Athletics	3.3	6	12	18	9	1	14

7. General Assessment

How would you rate your overall preparation to:

	ave	No opinion	Extremely Satisfied 5	Very Satisfied 4	Somewhat Satisfied 3	Not Satisfied 2	Not Satisfied 1
Be a competent engineer in industry?	4.3	1	21	33	4	1	0
Be successful in graduate school?	3.8	22	9	14	13	2	0
Otain your first job after graduation?	3.9	2	20	18	15	4	0
To be a designer	3.9	1	15	27	15	2	0
Serve Christ through your profession and life?	4.4	1	28	25	5	1	0

Would you recommend a Calvin engineering education to a friend or relative? Yes: 56, No: 0, Maybe: 4

Please list the major strength(s) of your engineering education.

Please list any areas for improvement in our engineering program. Do you have any suggestions as to how these areas can be improved?

8. Influential Faculty and Staff

Of the engineering professors at Calvin College, list one or two that were the most influential in your professional, academic, or personal development and why?

Those mentioned more than 10 times: Nielsen, Hoeksema, VandenBosch

Those mentioned between 1 and 9 times: VanderLeest, DeRooy, VanPoolen, Brouwer, Wentzheimer, Heun, Ribeiro

The reasons given (and number of times mentioned are as follows):

Good teacher (organized/learned a lot)	18
Approachable/Caring/Wanted to help	19
Advisor/Career advice	9
Many classes with	7
Helped w/ internship/job/grad school	13
Passion/excitement	10
Faith application	3
Pushed hard/firm but fair	6
Help at a particular time	4
Life outside of class	2
Leader	1

Of the other professors and staff that you have had at Calvin College, list one or two that were the most influential in your professional, academic, or personal development and why?

Those mentioned 3 or more times are Paul Harper - Physics (5), Gerry Fondse – English (3), Ricki Wagstrom – Mathematics (3) and Robert Medema - Econ and Business (5).

Engineering Department Job Placement Survey Results Spring 2003

*Position selected by student is bolded

Group	Average number of job offers extended	Average number of job interviews
All concentrations	1.3	2.6
Civil	1.1	2.2
Chemical	1.0	1.0
Electrical	1.0	2.0
Mechanical	1.6	3.3

		All offers	Only offers accepted by student
All students	Number	37	27
	Low	\$24,960	\$33,000
	Mean	\$41,130	\$41,690
	High	\$55,000	\$50,000
Civil Concentration	Number	14	
	Low	\$24,960	
	Mean	\$38,730	
	High	\$50,000	
Chemical Concentration	Number	1	
	Low	\$55,000	
	Mean	\$55,000	
	High	\$55,000	
Electrical & Computer Concentration	Number	3	
	Low	\$36,000	
	Mean	\$41,000	
	High	\$50,000	
Mechanical Concentration	Number	19	
	Low	\$33,000	
	Mean	\$42,240	
	High	\$51,000	

Engineering Department Graduate School Survey Results Spring 2003

A total of 11 students applied to graduate schools:

- 3 Chemical
- 3 Civil
- 2 Electrical/Computer
- 3 Mechanical

7 students were offered fellowships/assistantships.

7 Students indicated they will be attending grad school (5 with fellowships/assistantships).

A list of schools students will attend:

- University of California – Irving (Chemical)
- University of Illinois – Urbana-Champaign (Chemical/Bio-molecular)
- University of Michigan (Mechanical)
- University of New Mexico (Mechanical)
- University of Michigan (Urban Planning)
- University of Notre Dame (Chemical)
- University of Maine (Structural)

A list of schools that accepted students:

- Carnegie Mellon University
- Iowa State University
- Michigan State University
- Robotics Institute at CMU
- State University of New York – Buffalo
- University of California
- University of California – Irvine
- University of Connecticut
- University of Delaware
- University of Illinois – Urbana-Champaign
- University of Iowa University of Pittsburgh
- University of Maine
- University of Massachusetts – Amherst
- University of Michigan
- University of Minnesota
- University of New Mexico
- University of Notre Dame
- University of Washington

October 2002 FE Exam Results

- 22 students took the test, 22 students passed
- Calvin's pass rate: 100%, State pass rate: 92%, National pass rate: 79%
- Majors and pm exams selected:

Major	PM Examination	# Students
Chemical	General	2
Civil	Civil	1
Civil	General	10
General	General	7
Materials	General	1
Mechanical	General	1

April 2003 FE Exam Results

- 20 students took the test, 19 students passed
- Calvin pass rate: 95%, State pass rate: 83% , National pass rate: 82%
- Majors and pm exams selected:

Major	PM Examination	# Students
Civil	Civil	1
Civil	General	3
Electrical	Electrical	1
Electrical	General	4
General	Electrical	1
General	General	3
Mechanical	General	7

40 Students took the exam (out of 60 seniors) ~66%

Survey of 1993 Calvin College BSE Graduates

Thank you for participating in this survey of engineering graduates. The information that you provide by means of this survey will be very helpful in our process of continual improvement of the engineering program at Calvin.

Out of 55 surveys sent 26 were returned (47% response).

Your name (OPTIONAL) 25 provided names

Academic history at Calvin

Engineering Concentration: Civil-10 Electrical & Computer-7 Mechanical-9 Chemical-0

Professional history information:

Please provide information about your current professional position:

Company name and location (OPTIONAL) 24 provided company names

Job title or Job function (OPTIONAL) 26 provided this information

How many different engineering positions have you held in the years since graduation? 2.8 (4/26 held one position)

Have you seen significant advancement in responsibility in these years? Y-24 N-1 Please elaborate.

Have you become professionally licensed? Y-7 N-18

Have you received patents for any of you engineering work? Y-7 N-18 If Yes, how many? 17 total

Have you published any peer-reviewed journal or conference papers? Y-4 N-21 If yes, how many? 11 total

Have you published any engineering related books? Y-1 N-24 If yes, how many? 2 total

Did you complete a graduate degree? Y-13 N-12 If yes, what degree and where?

- M in Statistics – U of Wisconsin
- MS – U of Wisconsin
- MSME – U of Toledo
- MBA – GVSU
- MS Comp Scie & Engr – U of Michigan
- M of Architecture - U of Oklahoma
- MS Engr Management – Western Michigan
- MBA – Michigan State
- M – U of Michigan
- MSEE – Michigan State
- MS Engr Management – Western Michigan
- MSE – U of Michigan
- MSE – U of Washington
- M in Transportation Engr – U of Texas
- MBA
- MS in Industrial System Engr

Please give the approximate number of professional learning activities you have participated in since graduation?
25 out of 26 reported some activity

Ave 12 Seminars; ave. 4 Short courses; ave 9 graduate courses; avg 8 Other, please specify

General Assessment of Calvin's engineering program

How would you rate your overall preparation to:

	Extremely Satisfied	Very Satisfied	Satisfied	Somewhat Satisfied	Not Satisfied	ave
	5	4	3	2	1	
Be a competent engineer in industry?	5	14	5	1	0	3.9
Be successful in graduate school?	6	8	1	0	0	4.3
Obtain your first job after graduation?	1	7	13	2	2	3.1
To be a designer	5	10	5	5	0	3.6
Serve Christ through your profession and life? ...	6	11	6	1	2	3.7

Would you recommend a Calvin engineering education to a friend or relative? Yes-25 No-0 Maybe-1

Assessment of Specific Abilities and Attributes

Please give us your feedback on the following abilities and attributes. Our goal is that all of our graduates possess these abilities and attributes. Now that you have had several years of professional experience, tell us if we were successful. Please feel free to use the space after the list to briefly explain any of your responses, especially if your preparation was less than adequate.

	Level of Preparation					ave
	very well prepared	well prepared	adequately prepared	partially prepared	poorly prepared	
	5	4	3	2	1	
How well were you prepared:						
To apply knowledge of mathematics, science, and the engineering sciences as appropriate guidelines for design decision making?	13	8	4	0	0	4.4
To design and conduct experiments, as well as analyze and interpret data to extract meaning?	10	9	3	3	0	4.0
To design a system, component, or process to meet desired needs and to produce a prototype or model which can effectively test the basic principles of the design?	7	7	8	0	1	3.8
To function on a multi-disciplinary team?	9	11	4	1	0	4.1
To identify, formulate, and solve engineering problems using fundamental principles?	9	12	3	0	0	4.3
To communicate truthfully and effectively?	12	10	2	0	0	4.4
To communicate orally?	6	11	7	1	0	3.9
To communicate in writing?	10	10	3	1	1	4.1
To use the techniques, skills, and modern engineering tools necessary for engineering practice to develop responsible technologies?	5	7	9	2	1	3.5
To understand professional and ethical responsibility from a Christian, holistic perspective?	11	11	2	1	0	4.3
To understand the impact of engineering solutions in a global and societal context including an understanding of Christian stewardship of resources?	5	11	6	3	0	3.7

Question 1: How do you think that you are different (personally and/or professionally) because your engineering degree was earned at Calvin College?

- Calvin is extremely solid on the fundamentals of materials and machine design. That has been very helpful when analysing designs for merit. In addition, I try to design for minimal environmental impact from manufacture to disposal. Strong ethics in today's work force are invaluable!
- I enjoyed several influences at Calvin that were not commonly experienced by my professional peers:
 - Sharing my college years with many non-technical peers, with their distinctive world views.
 - Minor in Philosophy with its distinctive disciplines.
 - Studying a liberal arts curriculum, with its broad range of perspectives on problem solving.These influences have contributed to unusual interpersonal & problem-solving skills that have served many very well in many areas of my life.
- I believe the students would be well served with some instruction about how total depravity influences the workplace. Wisdom and character frequently have a much greater influence on what one may accomplish in an antagonistic environment than technical skill (which can generally be supplemented on the job). A firm grasp of these realities would benefit students as they leave the shelter of Calvin.
- This was a difficult question for me to answer. On a personal note I've been part of the Christian school system all my life so I am thankful that I was able to continue that Christ-Centered environment throughout my years at Calvin. This has given me opportunity to reflect my faith better in my career. On a professional level, since I don't have much to compare with I can only say the Calvin has been very helpful in providing the knowledge that I need for my career path.
- I cannot stress enough about the importance of design methodologies, and their place in the engineering profession. Once design requirements and groundwork are laid out for a project, the implementation and execution phases are much easier to accomplish as well as any changes and enhancements that may occur. This was a learning curve for me.
- I think the rigorous training that I received at Calvin set me up to be ready for and successful in graduate school and in the industry. Even though I switched careers, the engineering program gave me a good set of analytical skills. I really enjoyed my Calvin education.
- I believe I act with a greater integrity and more fully understand the impact that I have on society as an engineer
- Better understanding of fundamental principles. Grew spiritually thru classes (both engineering and others) and Prof's witness.
- Calvin College taught me how to learn. Once you know that you can teach yourself new skills as the industry changes keeping yourself "relevant" in your field. As a Calvin College graduate I was better prepared than many graduates from large prestigious universities that teach "cookbook" engineering. Calvin Engineering grads have been equipped as well as grads from MIT, Stanford & Carnegie Mellon. Also having the Christian perspective is very good.
- Personally, it became evident immediately that others in my profession spent a lot of time socializing in bars or with alcohol and developed relationships under these circumstances.
- As an architect, I do not regularly use the specific engineering skills I learned, however the multi-disc approach at Calvin was critical in giving me a comfort level with other areas which I use every day. Strong liberal arts core in addition to engineering curriculum had made me exceptionally well rounded and has allowed me to excel in a completely different field.
- Professionally, I feel I was taught how to learn, which has been very helpful (and more important even than what was learned in those 4 years.) Personally, I was shaped in roughly equal portions by the engineering faculty, my fellow classmates, and by the Calvin staff I worked with at my job on campus. I don't know how it made me different but I do know it was the most shaping 4 years of my life.
- I feel that Calvin has helped develop in me a strong work ethic and also a positive and ethically driven decision maker.
- Calvin certainly taught me how to think systematically. Calvin also taught me how to present data in a way that supports my conclusions, Calvin's focus on preparing us for engineering.

- I participated in a team design prior to entering the “real world” and have an understanding of working with ethics as a Christian.
- Calvin College teaches team work and participation rather than self-center ness. It is the foundation of Christ that makes us examples and leaders in our companies.
- Compared to others I have worked with, my degree from Calvin gave me not only a very broad base of engineering tools & basic understanding of engineering principles, but also a very detailed & thorough comprehension of these tools & principles. I still remember pages of Proofs & deriving complex equations from $A=I \times V$ & $F=MA$ rigorous exercises many schools do not put enough emphasis on. Calvin also taught me Christian stewardship & responsibility in engineering. Personally my education gave me a high level of confidence, a can do it attitude, and very methodical approach to problem solving.
- I spent a lot of time with a great group of guys that took their commitment to engineering almost as seriously as their commitment to Christ. We all worked through Calvin with a desire to drive to succeed that went with us into our jobs. I have found that I am more motivated & determined to solve problems than my co-workers from other schools. My friends & I all have exactly the same BSEE degree from Calvin. The background of this degree has allowed all of us to succeed in fields ranging from product development, R&D, controls, manufacturing, & architectural electrical design.
- Quality classmates led to personal development.
- Calvin not only provided a proper engineering education it helped instill a personal “character” which has transferred to my professional life as well, Honesty, trustworthy, competent is both part of my personal and professional life.
- I think that Calvin did a great job teaching the fundamentals of Engineering. I also feel that the inclusion of Liberal Arts Courses was critical in creating a “complete education experience.
- The engineering program at Calvin taught me to be a professional, which is something it appears that most other engineering programs do not teach. Also the emphasis placed on social responsibility or social impact of design also sets me apart from my peers in some cases. The emphasis on oral and written communication skills has also proven to be a vital asset.
- Personally the program taught me discipline and the schools principles stressed stewardship using my knowledge and abilities. Professionally the demands of the program have translated to me demanding a lot of myself and others. I also have an ability to work on multiple aspects of transportation engineering which is due to an open mind and an ability to learn anything possibly from my broad education I also found that when studying for the PE exam I picked up on multiple sections with hard work. Finally I stress that my interest in management, business, politics and engineering as a whole I think are due to my expansive liberal arts education.

Question 2: What advice to you have as we continue to improve and develop the engineering program at Calvin College?

- Teach mechanisms. Teach how to move, guide, rotate, and absorb energy position. Teach how to design mechanisms that are manufacturability and reliably work. That’s the biggest thing I had to learn after graduating.
- Should continue the mentoring program (show the students what they will be doing in the future) and have more field design work – show the students how their designs will be built by the workers.
- Continue to expand the internship program.
- Make technical writing one of the focal points of the program.
- Don’t reduce or compromise academic standards even if the entering students appear to be less prepared or able to handle the curriculum. It would be better to graduate fewer well-prepared individuals than more ill-prepared individuals.
- Continue to give students exposure to internships and mentors. Summer work at engineering firms gives them an ability to apply what they learning. As much hands on, practical projects that can be done in the classroom the better. As far as Civil Engineering goes, it would be helpful to touch on the importance of local and state politics and funding to civil engineering projects.
- Maintain the multi-disc. approach, ie. All engr. Students get exposed to Elec, Civil, Mech, Chem, etc. This combined with Calvin’s liberal arts strength is invaluable to a students future . You never know where life (God) will take you.

- Projects like the senior design projects were very helpful. (Although group activities for the sake of group activities are not). Oral & written communications are vital & probably more important than engineering. Also, attitude & leadership ability are very important. I think professional registration is important & could be emphasized more.
- Keep focus on manufacturing (engineering for manufacturing).
- Graduate school was actually something of a dis-service in actual professional practice.
- Continue the Senior Design Projects!
- Improve co-op jobs to get students involved with industry to learn hands on engineering, and to increase train fo industry tools and techniques (programs analysis, design considerations and industry code, ie. National Electric Code, IEEE, NEMA, NFPA.
- One thing which my Calvin education lacked is a means of application to industry, but while I was at Calvin, it was difficult to see how I would apply my education. I would recommend more tours of companies, short term internships, or special guests to explain what engineers actually do. I believe this might help build the bridge form books, labs, & theory to reality.
- Get students exposure to work in the real world. Make it so they can spend some time with some one that's been in the work force for a while.
- Need to stress interjection between statistics & engineering. Poor use of statistical tools in problem solving at Calvin, convert stats in class to DOE, process control etc. No appreciation for non-metals. All process/material knowledge of plastics learned on job. Need a bit of Ferris and WMU expertise at Calvin.
- When I entered the product engineering field (automotive interiors) the only knowledge I lacked was plastic materials and processing methods. A plastic specific design course would have helped me.
- I think its always good to emphasize applied knowledge. The Sr. Project is good but perhaps more open ended group projects would be helpful. My situation may not be typical but I chose to go into the biomedical engineering area. This resulted in the need to learn effective documentation skills. Most of these skills were learned on the job. I know it's difficult to simulate industry in the college setting and I don't have any novel solutions, but any opportunity to provide "real life" problem solving should be taken.
- Continually update the program with the latest design engineering disciplines.
- Keep the program general lends to much more well rounded engineers. Keep up the good work and continue demanding a lot. Continue requiring extensive liberal arts, communications classes, include surveying, road design and offer transportation engineering.

Survey of 2000 Calvin College BSE Graduates

Out of 44 surveys sent 19 were returned (43% response)

General Information:

16 out of 19 gave their names

Current professional position (Company and job title/description) - *20 out of 22 gave this information*

Academic history at Calvin

Engineering Concentration:

Civil - 6

Electrical & Computer - 1

Mechanical - 12

Chemical - 0

Did you transfer into engineering at Calvin from another school or another program at Calvin? Y - 2 N - 17

Number of full-time semesters taken to graduate – 14 out of 17 (82%) in 4 years

If you took more than eight semesters, please indicate why (you may select multiple options)

0 Transferred into Calvin College

1 Repeated courses

2 Pursued minor or second major

0 Planned slower pace

2 Other, explain. (death in family) (year of unrelated courses before major)

Did you have an engineering Internship experience? Y-18 N-1

Overall GPA upon graduation from Calvin 3.4

Professional history information:

17 out of 19 (89%) did not attend grad school

How many months before or after graduation did you receive your first professional job offer? 2.4 before

How many different engineering positions have you held in the years since graduation? 2.0 (6/17 have had 1)

Have you seen significant advancement in responsibility in these years? Y-14 N-2 Please elaborate (13 did so)

What professional learning activities have you participated in since graduation? (16/17 reported some activity)

13 Seminars 8 Short courses 3 Graduate courses 0 Other, please specify

Graduate School:

4 out of 19 applied to grad school (21%)

How many schools did you applied to? 3.5 How many schools accepted you? 3.3 (everyone accepted somewhere)

How many monetary offers did you receive? 2.7

What degree(s) did you complete MSEE, MSE (Civil),

If you are still in graduate school: What degree are you pursuing? Masters

Describe your first professional position after graduate school: Electrical Engineer, Computer Modeling

Assessment of the engineering curriculum and facilities

Use this section to give your overall assessment of the engineering curriculum. Rate both the emphasis given at Calvin College and your perception of their value for your professional development - regardless of the emphasis given at Calvin. You answers should reflect your opinion at this time (not at the time of graduation).

	Emphasis in Program				Value for Engineering						ave
	too much	adequate	too little	ave	extremely important	very important	important	somewhat important	not important	ave	
	3	2	1		5	4	3	2	1		
E. Basic Subjects											
Mathematics.....	2	17	0	2.1	4	5	8	2	0	3.6	
Physics.....	0	18	0	2.0	2	8	5	3	0	3.5	
Chemistry.....	2	15	1	2.1	0	0	6	6	6	2.0	
Computer Science.....	0	10	8	1.6	0	4	9	5	0	2.9	
English rhetoric / Speech.....	0	15	3	1.8	3	10	4	1	0	3.8	
Philosophy.....	7	11	1	2.3	1	1	8	4	5	2.4	
“Liberal Arts Core”.....	0	17	1	1.9	2	5	8	3	0	3.3	
Economics and Business.....	1	9	9	1.6	3	9	5	2	0	3.7	
F. Engineering Subjects											
First year intro courses.....	1	13	1	2.0	2	3	4	5	1	3.0	
Common engineering core (Materials, Statics and Dynamics, Electronics, Thermal Sciences).....	1	15	1	2.0	4	8	5	0	0	3.9	
Concentration specific courses.....	0	12	5	1.7	6	8	3	0	0	4.2	
Senior Design.....	0	16	1	1.9	7	5	4	1	0	4.1	
Senior Interims.....	2	12	4	1.8	1	5	6	3	2	3.0	
G. Other program components											
Laboratory experiences.....	0	13	5	1.7	3	6	4	5	0	3.4	
Mentoring.....	0	4	13	1.2	2	5	8	2	0	3.4	
Internships.....	0	9	8	1.5	11	6	0	0	0	4.6	
Engineering Seminars.....	1	14	1	2.0	0	4	9	3	0	3.1	
International Interims.....	1	13	2	1.9	2	1	7	4	2	2.8	
Technical writing.....	0	11	6	1.6	6	8	2	1	0	4.1	
Professional Society student Chapters (ASCE, ASME, and IEEE).....	0	12	4	1.8	1	4	5	6	0	3.0	
Integration of Christian faith throughout Engineering program.....	0	12	4	1.8	6	8	1	1	0	4.2	

H. Facilities. Certain program facilities play an important role in preparing engineering students for their profession. Please rate the following engineering department facilities in terms of their adequacy for you professional preparation.

	exceptional 5	more than adequate 4	adequate 3	less than adequate 2	useless 1	
Computing.....	4	7	6	1	0	3.8
Science laboratories	0	7	8	3	0	3.2
Engineering laboratories	1	3	7	7	0	2.9
Engineering design facilities.....	3	6	8	1	0	3.6

Assessment of Specific Abilities and Attributes

Please give us your feedback on the following abilities and attributes. Our goal is that all of our graduates possess these abilities and attributes. Now that you have had several years of professional experience, tell us if we were successful. Please feel free to use the space after the list to briefly explain any of your responses, especially if your preparation was less than adequate.

	Level of Preparation					
	very well prepared 5	well prepared 4	adequately prepared 3	partially prepared 2	poorly prepared 1	
How well are you prepared:						
To apply knowledge of mathematics, science, and the engineering sciences as appropriate guidelines for design decision making?	7	8	2	2	0	4.1
To design and conduct experiments, as well as analyze and interpret data to extract meaning ?.....	4	6	6	3	0	3.6
To design a system, component, or process to meet desired needs and to produce a prototype or model which can effectively test the basic principles of the design?.....	2	7	7	1	2	3.3
To function on a multi-disciplinary team?.....	5	9	4	0	1	3.9
To identify, formulate, and solve engineering problems using fundamental principles?.....	4	9	4	1	0	4.1
To communicate truthfully and effectively?.....	8	6	5	0	0	4.1
To communicate orally?	3	6	6	4	0	3.5
To communicate in writing?.....	4	9	4	2	0	3.7
To use the techniques, skills, and modern engineering tools necessary for engineering practice to develop responsible technologies?	0	10	7	2	0	3.4
To understand professional and ethical responsibility from a Christian, holistic perspective?	8	8	2	1	0	4.0
To understand the impact of engineering solutions in a global and societal context including an understanding of Christian stewardship of resources?	5	9	2	3	0	3.8

Optional Explanations:

General Assessment

How would you rate your overall preparation to:

	Extremely Satisfied	Very Satisfied	Satisfied	Somewhat Satisfied	Not Satisfied	ave
Be a competent engineer in industry?	5	8	4	2	0	3.8
Be successful in graduate school?	5	1	2	1	0	4.1
Obtain your first job after graduation?	8	7	4	0	0	4.2
To be a designer	2	7	8	1	0	3.6
Serve Christ through your profession and life? ...	4	7	7	1	0	3.7

Would you recommend a Calvin engineering education to a friend or relative? Yes-16 No-0 Maybe-2

Please list the major strength(s) of your engineering education.

Responses:

Christian perspective (1)	Team work (1)
Communication skills (5)	Good fundamentals (4)
Well rounded (7)	Design Process (1)
Dedicated Profs (1)	Close contact with faculty/personal attention (2)
Small classes (1)	Strong work ethic (2)
Internship (2)	Good Teaching (1)
Hands-on Experience (1)	Problem solving (3)

Please list any areas for improvement in our engineering program.

Responses:

Build confidence (1)	Quality problem solving techniques (1)
Design on experiments interim (1)	More statistics (1)
More business (1)	More manufacturing (1)
Leadership class (1)	More real world applications (2)
More course options (4)	More writing (1)
More Internship emphasis (6)	Keep broad focus in EE (1)

Influential Faculty and Staff

Of the engineering professors at Calvin College, which several were the most influential in your professional development and why?

NN (9), RDJ (4), others 1 to 2 (SVL, BP, LVP, RH, GE). Reasons (those mentioned 3 or more times):

Challenging/interesting teaching

Real world/industry experience

Mentorship/career guidance

Of the other professors and staff that you have had at Calvin College, which several were the most influential in your professional development and why?

Chip Pollard mentioned twice. No others mentioned more than once

2003 First-year Engineering Student Career Development Assessment - RESULTS

I. Choosing Engineering as a major

A. Rate each statement by how much the person or thing listed below positively influenced you to pursue engineering. If your rating needs explanation, please add comments. Use the following scale:

++ = Strong positive influence to pursue engineering
 N = neutral or no influence in regard to career decisions
 -- = Strong negative influence

	++(1)	N(3)	--(5)	ave			
1)	9	38	28	8	1	2.5	My engineering courses
2)	14	45	23	2	0	2.2	The professors in my engineering courses
3)	7	18	54	3	0	2.6	An engineering mentor
4)	4	27	43	4	5	2.7	My academic advisor
5)	19	42	21	1	0	2.0	Friends and/or family
6)	14	45	22	2	0	2.1	Courses I took in high school
7)	11	34	33	4	1	2.4	High school teachers
8)	5	32	40	6	0	2.6	Career and college information I got in high school
9)	1	8	68	5	2	3.0	Calvin College Career Services office
10)	1	1	74	5	2	3.1	Calvin College Broene Counseling Center
11)	0	28	50	6	0	2.7	Student professional societies, departmental seminars, departmental tours
12)	4	21	55	2	2	2.7	Student internship or summer job
13)	16	50	15	1	1	2.0	Career prospects (jobs available and wages)
14)	10	43	27	4	0	2.3	Calling (mission, prayer, spiritual growth possibilities in engineering)
15)	2	23	52	5	2	2.8	mass media (TV, radio, Internet, magazines)
16)	1	19	61	1	2	2.8	Engineering department brochures, bulletin boards, newsletters, etc.
	++(1)	N(3)	--(5)				

B. Tell us how each of the following courses affected your choice of engineering as a career.

++ = Gave strongly positive impression of engineering
 N = Didn't make much difference in my career decision
 -- = Gave strongly negative impression of engineering **or** encouraged pursuit of some other career choice

	++(1)	N(3)	--(5)	ave			
1)	12	37	25	8	1	2.4	ENGR101 Introduction to Engineering Design and Graphical Communication
2)	20	41	13	4	4	2.2	ENGR181 Lab Graphical Communication (AutoCAD)
3)	6	33	23	15	7	2.8	ENGR106
4)	8	29	29	12	6	2.8	MATH 161, 162 Calculus Sequence
5)	1	18	29	31	4	3.2	CHEM103 General Chemistry
6)	0	2	18	6	02	3.2	CHEM104 General Chemistry (Note: rate this course only if applicable)
7)	3	21	30	22	5	3.1	PHYS 133 Introductory Physics: Mechanics and Heat

C. Which components of the first year engineering sequence (ENGR101-106) affected your choice of engineering as a career? (Use same scale as above)

	++(1)	N(3)	--(5)	ave			
1)	13	41	22	4	3	2.3	Design projects
2)	1	16	46	17	3	3.1	Reading assignments
3)	2	27	42	12	0	2.8	Homework
4)	8	32	39	1	1	2.4	Field trips
5)	8	33	33	8	1	2.5	Computer assignments
6)	8	39	29	6	1	2.4	Laboratory Experiences
6)	0	1	17	0	0	2.9	Other items? Please list:

D. By the end of your sophomore year you will have to select an engineering concentration (Chemical, Civil, Electrical & Computer, or Mechanical). If you have already made a choice of engineering concentration, did ENGR 101/ 102 have an influence on that decision? Y - 17 N – 59 (22% say yes)

E. Overall, have you received a good picture of the distinction between the concentrations? (circle one)? Y - 70 N - 12 If No, explain. (85% say yes)

II. Engineering Department Objectives

Do you understand objective 1?	78 Yes	5 Partially	0 No
Do you understand objective 2?	74 Yes	9 Partially	0 No
Do you understand objective 3?	76 Yes	6 Partially	1 No

III. Personal Information

A. What is your gender? 72 Male 12 Female

A. Where is your hometown? (Mark one)

22 Grand Rapids area 15 Michigan 14 Midwest 23 United States 10 Outside U.S.

C. Name (optional, but helpful): 43 gave names

6-Oct-04

2003 Sophomore Engineering Student Career Development Assessment - RESULTS

I. Choosing an Engineering Concentration

This section explores how you selected your concentration (chemical, civil, electrical, mechanical).

A. Place an "X" next to the statement that you agree with the most:

- 1) 30 I knew what concentration I wanted to pursue before I came to Calvin.
- 2) 7 I knew what concentration I wanted to pursue by the end of my first year.
- 3) 16 I knew what concentration I wanted to pursue by the time I applied for admission.
- 4) 3 I am still not sure which concentration I want to pursue.

B. If you have selected a concentration, mark your choice below. Otherwise leave blank.

4 Chemical 16 Civil 18 Electrical & Computer 18 Mechanical 0 Other: _____

C. Place an "X" next to each person or thing that strongly influenced you to pursue your concentration.

- 1) 32 Engineering courses
- 2) 20 My professors in Engineering courses
- 3) 5 Non-engineering courses
- 4) 5 My engineering mentor
- 5) 5 My academic advisor
- 1) 28 Friends and/or family
- 7) 27 Courses I took in high school
- 8) 16 High school teachers
- 9) 9 Career and college information I got in high school (from career days, career office, etc.)
- 10) 1 Calvin College career office
- 11) 0 Calvin College Broene Counseling Center
- 12) 9 Student professional societies, departmental seminars, departmental tours
- 13) 20 Student internship or summer job
- 14) 17 Career prospects (jobs available and wages)
- 15) 20 Calling (mission, prayer, spiritual growth possibilities in engineering)
- 16) 9 Mass media (TV, radio, Internet, magazines)
- 1) 1 Engineering department brochures, bulletin boards, newsletters

D. What were the main reasons you selected your concentration?

E. What were the main reasons you decided against each of the other concentrations (mark your selected concentration "N/A").

Chemical:

Civil:

Electrical & Computer:

Mechanical:

F. Score each course for how it represented each concentration. If your rating needs explanation, please add specific comments. Complete for each concentration, even if you did not select that concentration. Leave the item blank if you have not taken that particular course.

++ = Gave a very positive impression of the concentration (made me want to pursue it)
 N = Gave little representation of the concentration
 -- = Gave me a very negative impression of the concentration (made me not want to pursue it)

What impression did the following courses give you for **chemical engineering**:

	++(1)	N(3)	--(5)	ave	
1)	4	43	4	0	2.9 ENGR101 Intro to Engineering Design
2)	5	40	2	2	2.8 ENGR181 Lab Graphical Communication (AutoCAD)
3)	6	12	9	22	6 3.2 CHEM103 General Chemistry
4)	7	13	8	15	12 3.2 ENGR 106
5)	8	13	6	13	12 3.2 ENGR 209

What impression did the following courses give you for **civil engineering**:

	++(1)	N(3)	--(5)	ave	
1)	3	18	33	1	0 2.6 ENGR101 Intro to Engineering Design
2)	4	24	23	4	0 2.5 ENGR181 Lab Graphical Communication (AutoCAD)
3)	2	14	32	5	1 2.8 ENGR 106
4)	5	23	25	2	0 2.4 PHYS 133
5)	21	21	9	4	1 2.0 ENGR 202
6)	2	4	35	9	4 3.2 ENGR 209

What impression did the following courses give you for **electrical/computer engineering**:

	++(1)	N(3)	--(5)	ave	
1)	1	9	41	3	0 2.9 ENGR101 Intro to Engineering Design
2)	1	10	40	3	0 2.8 ENGR181 Lab Graphical Communication (AutoCAD)
3)	1	5	37	7	1 3.0 ENGR 106
4)	3	14	10	17	10 3.3 PHYS 235
5)	7	18	11	10	7 2.8 CPSC 153-4
6)	10	19	5	11	10 2.9 ENGR 204

What impression did the following courses give you for **mechanical engineering**:

	++(1)	N(3)	--(5)	ave	
1)	8	18	27	1	0 2.9 ENGR101 Intro to Engineering Design
2)	9	25	19	2	0 2.8 ENGR181 Lab Graphical Communication (AutoCAD)
3)	2	16	27	9	0 3.0 ENGR 106
4)	4	30	17	2	2 3.3 PHYS 133
5)	22	24	4	4	1 2.8 ENGR 202
6)	1	7	32	10	5 2.9 ENGR 209

G. Overall, did you receive a good picture of the distinction between the concentrations?

Y - 50 (89%) N - 6 (circle one) If No, explain:

II. Engineering Department Objectives

Do you understand objective 1? Evidence?	56 Yes 52 Yes	0 Partially 4 Partially	0 No 0 No
Do you understand objective 2? Evidence?	51 Yes 40 Yes	3 Partially 15 Partially	1 No 1 No
Do you understand objective 3? Evidence?	54 Yes 38 Yes	1 Partially 18 Partially	0 No 0 No

III. Personal Information

A. What is your gender? 51 Male 4 Female

B. Where is your hometown? (Mark one)

12 Grand Rapids area 13 Michigan 13 Midwest 11 United States 6 Outside U.S.

C. Name (optional, but helpful): 35 gave names

6-Oct-04

Minutes
CEAC General Meeting
Friday, November 22, 2002, 1:20 pm

Council Members Present: James Bickford, Phil Brondsema, Dennis Cole, Darryl De Bruin, Jeff De Heer, Ralph DenHartigh, Imad Mahawih, Mark Michmerhuizen, Paul Milkamp, Ronald Plaiser (chair), Charles Spoelhof, Brian Swierenga, Nancy Sykes, Paul Tubergen, Ren Tubergen, Steve Witte.

Faculty Present: Randy Brouwer, Gayle Ermer, Ned Nielsen, Paulo Ribeiro, Jennifer Van Antwerp, Jeremy Van Antwerp, Bryan VandenBosch, Wayne Wentzheimer

1. Ron Plaiser opened with devotions.
2. Everyone present introduced themselves.
3. Randy Brouwer presented a State of the Department report including
 - Educational Objectives
 - Current State of the Program
 - Successes
 - Challenges
4. Chuck Spoelhof noted that engineering is barely mentioned in the recent Calvin Facts brochure. CEAC will address this with admissions.
5. The department's website was discussed. CEAC recommended that it be updated to address an audience of high school juniors. Phil Brondsma and James Bickford volunteered to help with website evaluation.
6. The future needs and challenges of industry were discussed. The following points were made:
 - Students need practice in solving open-ended problems in which they need to find their own sources of information.
 - Students need to be multi-taskers and need to learn project management skills.
 - Since students will be working in very large workgroups with minimal supervision, they need time management and communication skills. The new speech course should address running meetings and writing good emails as well as doing presentations.
 - Students need to recognize the competitive and global nature of business today. They need to be able to make decisions under uncertainty.
 - CEAC members are encouraged to give or suggest colleagues to give seminars to expose students to these issues.
 - A smaller group of CEAC members should do some research and continue this discussion. A dinner venue was proposed.

7. The relationship between faith, engineering, and work was discussed. Some comments:
 - By engineering we are discovering what God already knows.
 - As engineers we rely on God's order and consistency in creation, as opposed to our culture's current emphasis on randomness.
 - Christian engineers are inclined to work toward sustainable systems within a framework of stewardship.
 - Christian engineers emphasize integrity.
 - Our Christian faith shows in the way we act and the way we treat people.
 - Engineers continually make decisions, and for a Christian each decision is influenced not just by personal gain, but by what is right.
 - Engineering can help win people to Christ through the relationships that are developed.
 - The "Character First" website may be a helpful resource.
 - Students could greatly benefit from a brochure or presentation describing what it means to be a Christian engineer from the perspective of engineers working in industry. CEAC should work towards developing something like this, perhaps in conjunction with other Christian colleges with engineering programs.

8. Meeting was adjourned at 2:40 pm.

CEAC Chemical Breakout Session - Nov. 22, 2002

Members present: J. VanAntwerp, J.J. VanAntwerp, W. Wentzheimer, B. Swierenga, I. Mahawili, C. Spoelhof, P. Brondsema, P. Milkamp, R. Plaisier, R. Tubergen

Action items in bold

We discussed the 3 Successes & 3 Challenges of the Chemical Concentration.

Successes

1. The program is well established.
2. People on the campus know about the chemical concentration.
3. We have very good students.

Challenges

1. We need to be known more broadly (including off-campus).
2. We need to recruit more new students (front end of pipeline).
3. We need to get internships for current students and jobs for graduates (back end of pipeline).

Members reported on fundraising efforts for an endowed Chem. Eng. Scholarship

1. Tubergen – there was a lead for internships @ Sun but no money no money from alumni.
2. Faculty who wish to give to the fund should designate “Chemical Engineering Scholarship” for the development office.
3. **CEAC members should send e-mail to Lois Konyndyk <konl@calvin.edu> summarizing Yes & No’s (i.e., the results of their contacts).**
4. **Aim to be done by the end of the year.**

[Phil mentioned that this scholarship would be for juniors, but I thought we had discussed targeting it to freshmen or sophomores as a way of bringing in students interested in ChE.]

Letter to CEAC ChE contacts was reviewed.

The letter **should be sent out before Christmas**, spell out ABET, 6 – 12 contacts/CEAC members.

(For Faculty) Create a monthly update by e-mail including alumni. [Can we set it up so that alumni keep their Calvin e-mail?]

Web site upgrade should be live “soon.”

1. What should it have to attract H.S. students in Florida or Texas?
2. What does a Chemical Engineer do?
3. Internships: Local, Regional, International
4. Statistics on Church Background
5. Academics with integrity
6. What does it mean to be a Christian Engineer:
7. Link pictures to industry web sites
8. List Scholarships (incoming students)

New courses for Interim:

1. Biology for engineers
2. Green engineering/EH&S

Wayne to talk to Vern Ehlers about business management and the perceived lack of new engineers – people are not being used right.

CEAC
Civil Breakout Minutes
November 22, 2002

Present: Leonard De Rooy, Robert Hoeksema, Ralph DenHartigh – JDH Engineering, Dennis Cole – Prien & Newhof, Steve Witte – Nederveld Engineering

1. Discussed how main meeting went. All thought it went well.
2. RH discussed the ASCE Michigan Mackinaw Scholarship fund drive. Calvin College faculty and friends are committed to \$500.00 donation this year (\$1000 over this year and last year.)
3. Discussed new civil positions
 - a. One year replacement for RH's sabbatical
 - b. Full-time position in Civil Field.
 - i. Asked the CEAC members what area they felt new position should cover.
 - ii. Discussed how it may change the current civil program.
4. Discussed Mentor program
 - a. Sr. Design Mentors
 - i. Dennis Cole recommended that we send a letter to Sr. Design mentors indicating changes in current mentor assignments (we now only assign mentors if requested by students)
 - b. Freshman Mentors
 - i. Dennis Cole indicated that he got contacted by Freshmen for the first time in four years. This is indicative of the changes that the freshman mentors are now a requirement of Engr 101.
 - c. Mentor Day
 - i. All the CEAC members agreed that they would be willing to come to Calvin on a Mentor day possibly with a panel of mentors. May be better than trying to get students to go to various offices.
5. We asked the CEAC members for feedback on the following items.
 - a. Should we teach Microstation? - All agreed that it is only for MDOT related civil positions and that it was similar to AutoCad.
 - b. Did they feel a student with "International Civil" concentration designation be beneficial? All agreed that it was not necessary and would not impact the selection of potential candidates for hire.
6. We adjourned at 5:00.

CEAC Electrical Concentration Breakout Session
Nov. 22, 2002, 3:30pm

Members present: J. Bickford, R. Brouwer, M. Michmerhuizen, P. Ribeiro , N. Sykes, and S. VanderLeest

1. Tour of the Engineering Building
2. Assessment of SB076 - Suggestions included:
 - a. New equipment: RF instrumentation, 3 phase motors, and in-circuit emulators
 - b. Students should learn to write one page executive summaries of their reports and include them with lab reports
 - c. More presentation experience is desired
 - d. Senior Design team students can "practice" technical presentations off-site at mentor companies
3. How do we make Calvin more credible?:
 - a. Good presentation by students
 - b. =< 1 page resume'
 - c. Cover letter that addresses why the student would fit
4. Short course topic suggestions (approx 1 s.h.)
 - a. Learn PLC's & 3 phase motors
 - b. Digital Signal Processing

Note: Don't lose the foundations when adding these topics – e.g. e-magnetics & Thermal
5. Adjourned at approximately 4:30pm

CEAC Mechanical Concentration Sectional Meeting
Friday, November 22, 2002, 3:30 pm

Present: Daryl DeBruin, Jeff DeHeer, Gayle Ermer, Ned Nielsen, Chuck Spoelhof, Ren Tubergen, Bryan VandenBosch

- Ned Nielsen noted that 3D solid modeling software (AutoCad Inventor) is being used in ENGR 181 this fall. This works out very well for ME students, but other software may need to be considered for the other concentrations.
- The balance of thermo/fluid/heat topics versus machine design topics was addressed in light of the new curriculum. There was no strong inclination to change the current balance, although perhaps the balance between thermodynamics, fluids, and heat transfer within the sequence could be shifted away from thermo and towards fluid dynamics (particularly hydraulics).
- CEAC members emphasized the need for students to get hands-on experience in labs, but recognized the time commitment required in creating lab experiences that are effective.
- Lab facilities: the group toured the mechanical engineering labs in the Science Building basement. The fluid/thermo lab is in good shape. The instrumentation lab needs cleaning up, and the 386 computer with the tensile tester needs to be updated. It was emphasized once again that signs be placed over all equipment to clearly identify its function.
- Meeting was adjourned at 5:00 pm.

Minutes
CEAC General Meeting
Friday, March 7, 2003, 3:00 pm

Council Members Present: Phil Brondsema, Dennis Cole, Steve Elliot, Brian Honeck, Mark Michmerhuizen, Ronald Plaiser (chair), Charles Spoelhof, Brian Swierenga, Nancy Sykes, Eric Walstra, Steve Witte.

Faculty Present: Randy Brouwer, Rich DeJong, Leonard DeRooy, Gayle Ermer, Matt Heun, Bob Hoeksema, Ned Nielsen, Paulo Ribeiro, Jennifer Van Antwerp, Steve VanderLeest, Wayne Wentzheimer

1. Ron Plaiser opened with devotions.
2. Everyone present introduced themselves.
3. Randy Brouwer presented a State of the Department report including
 - Curriculum Changes
 - The addition of an oral rhetoric requirement
 - The addition of an engineering minor
 - The updating of courses in the chemical concentration
 - Facility Changes
 - Staffing
 - Students
 - Senior Design
 - Challenges for the Future
4. CEAC requested a monthly update on the job status of graduating seniors for their possible support and continuing prayer.
5. It was suggested that a section of ENGR 101 be made available to high school students
6. Promotions
 - NN is working with a student to develop handouts describing the experiences of students in international internships.
 - LDR suggested developing a Christian Engineering brochure to be sponsored by all of the CCCU schools with engineering programs.
 - Phil Brondsema reported that he and James Bickford have made progress in updating the department's website.
 - CEAC volunteers were recruited to call prospective students.
7. CEAC membership was discussed. Members should contact Randy Brouwer as to whether they wish to serve another 3-year term. They should also suggest potential members to recruit.

