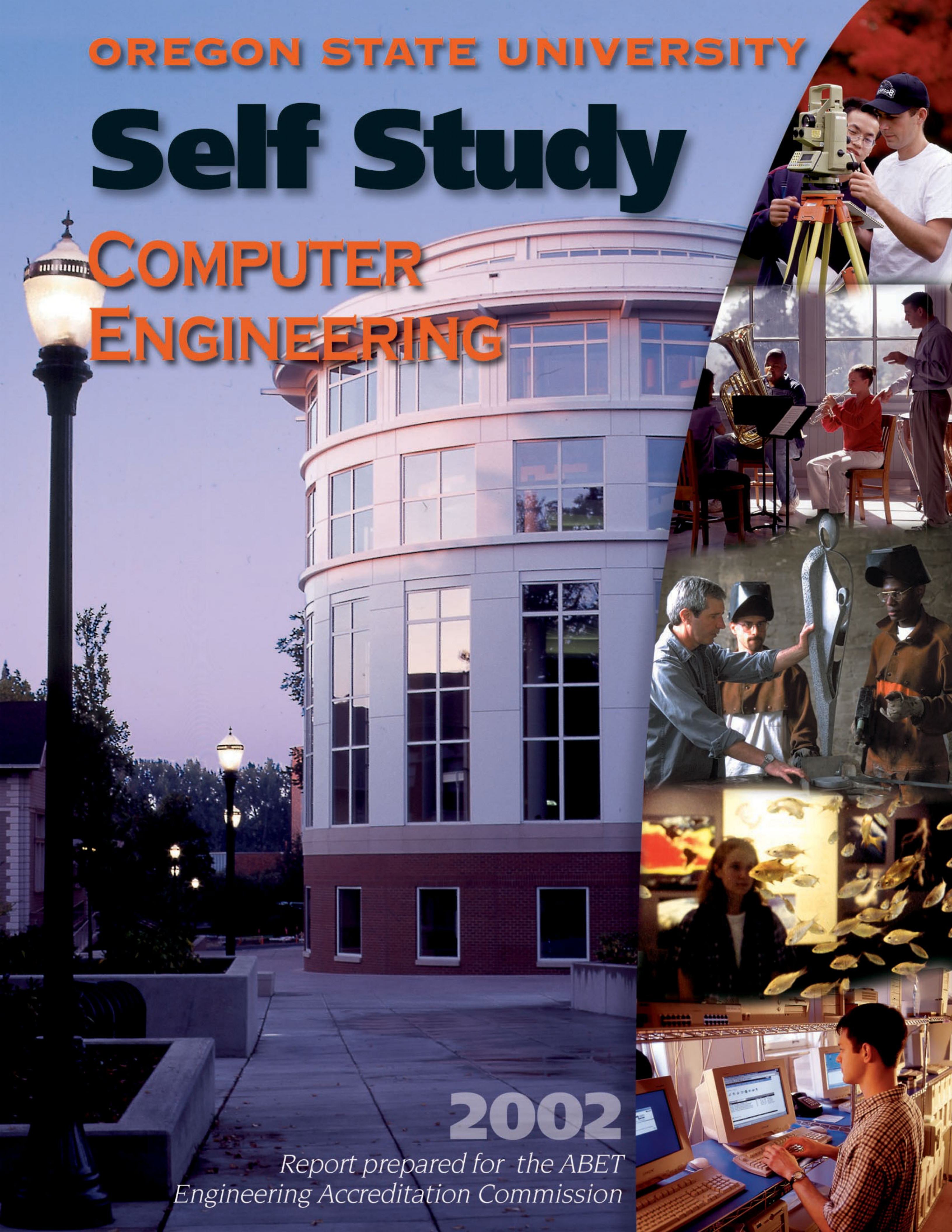
OREGON STATE UNIVERSITY

Self Study

COMPUTER ENGINEERING



2002

Report prepared for the ABET Engineering Accreditation Commission

SELF-STUDY QUESTIONNAIRE

Electrical & Electronics Engineering

Computer Engineering

Department of Electrical & Computer Engineering

Oregon State University

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Executive Summary

This is an exciting time for the Department of Electrical & Computer Engineering at Oregon State University. We have a clearly defined goal to increase our research prominence while at the same time creating a compelling learning environment for our undergraduate and graduate students. As a College of Engineering, we have defined the steps necessary to make this transition and we have engaged the state legislature, industry leaders and alumni in our efforts.

This report summarizes the Department of Electrical and Computer Engineering assessment and improvement of the Electrical & Electronics Engineering Degree Program and the Computer Engineering Degree Program conducted over the last several years. In collaboration with our constituents, we have defined our program educational objectives to include the ABET designated objectives:

- Breadth
- Depth
- Professionalism

and then we defined three additional ones that characterize what is unique about our program:

- Community
- Trouble-shooting
- Innovation

Our constituent surveys helped define areas for program improvement. Generally, these areas that needed improvement related to our senior design sequence and our hands-on laboratories. We are addressing these areas for improvement by making significant changes in both. We have changed the senior design class so that industry-sponsored projects are solicited for the students and there is an instructor from industry helping to lead the class. To address the issues related to the laboratories, we have embarked on a new curriculum we refer to as TekBots™. The successful student experience of building a robot in the freshmen year will be built upon throughout the next four years. We will use the robot as a "platform for learning". In their laboratory classes, they will add features to the robot based on the material they are learning in that particular class. By the time the students are seniors, they will have internet-controlled, wireless robots. We are in the first year of the four-year curriculum development effort.

We will continue to assess our program through graduate, alumni and industry surveys. Additionally, we are working with researchers in Math and Science Education to help us assess and improve our TekBots curriculum. They will help us to understand what pedagogical approaches improve student learning.

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A. Background Information

1. Degree Titles

This program grants a Bachelor of Science Degree in Electrical and Electronics Engineering. It also grants a Bachelor of Science Degree in Computer Engineering.

2. Program Modes

Departmental programs are offered on-campus during the daytime. Some laboratory sections are available in the evening. Some senior/graduate courses are offered off-campus, in the Portland area, through the OCATE (Oregon Center for Advanced Technology Education) program. Some of these courses are taught by video transmission. Approximately one-third of our juniors and seniors participate in the MECOP (Multiple Engineering Co-operative Program) internship program. This consists of two 6-month internships at different companies.

3. Actions to Correct Previous Deficiencies

No deficiencies identified.

4. Contact Information

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B. Accreditation Summary

1. Students

Advising Roles and Responsibilities

Student advising is organized and coordinated by the head advisor (Molly Shor) and the undergraduate administrative assistant (Lavon Reese). All of the undergraduate student records are maintained by the undergraduate administrative assistant. The department advises students in three different ways depending on where they are in the program.

High school seniors and incoming transfer students that have declared Electrical and Computer Engineering as their major are advised primarily through the START program the summer before they enter OSU. The incoming students are provided with a program overview and then they are advised by the head advisor and other faculty within the department. They are advised on the first year of study and a detailed schedule is established for the first term.

Freshmen and Sophomore students, and others not yet accepted into the professional program, are advised in advising sessions scheduled each term. Typically, a group of 4-6 faculty are available at one time to advise students on their program of study for the next term. After examining a student's progress to that point, the faculty member will help determine the next steps in their program.

Students accepted into the professional program (typically, juniors and seniors) are assigned an advisor (faculty member) within the department. They are encouraged to develop a yearly program of study with the advisor. Additionally, the students are encouraged to seek out faculty experts in their particular area of interest to help them determine which electives would be most appropriate.

The head advisor is involved in all questions of transfer of credit or other cases that are not straight forward. She validates all course transfers and makes sure that every student has met all requirements for graduation. She works with the community colleges (that a large number of students come from) to ensure that they advise students for seamless transfer to OSU.

Advising Criteria

The student's success in each course is evaluated by the instructor, who offers the student feedback on the program objectives covered in that course. These are listed concretely on the syllabus as course learning objectives and are evaluated based on class materials such as homework, examinations, and projects. The student is encouraged to work toward the achievement of those course objectives during the course.

The grading in each course is consistent with the student's achievement of the objectives covered by the course. Advisors have access to information on the student's success on achieving those program objectives in the form of the student's grades in his or her courses and curriculum information on what objectives are covered in each course. Advisors may also ask students who are not successful about what difficulties they are having. The Head Advisor sets up individualized advising sessions for students in the first two years that are below a 2.5 GPA.

Students are required to complete their PRE-engineering required courses with C- or better grades, and to average a 2.25 GPA in those courses (including in the GPA all retakes until the first C- or better grade), before proceeding to the professional program. This application and screening process is intended to screen out students who do not have the basic skills to succeed. A petition process is available for those who do not meet this standard. They must complete at least one year in a major outside of the college of engineering with a 3.0 grade point average in all technical courses, or complete two years of relevant work experience with a good recommendation from their employer, for a petition to be considered.

Students are required to complete their technical professional engineering courses (PRO courses) with C- or better grades, and to average a 2.25 GPA in those courses (computed the same way) in order to graduate. The College of Engineering Undergraduate Programs Office monitors their success. Students in danger of not achieving this minimum standard are required to meet with the Head Advisor of their department and draft a plan for their remaining professional courses that is realistic and will help them meet their learning objectives and earn good grades in those courses. Meetings to draft contracts are personalized, and the Head Advisor along with the Assistant Dean of Academic Affairs works with the student to determine the cause of his or her performance difficulty. The basic assumption is that students not meeting required program objectives will fall short on their overall performance in upper division technical coursework or fail to pass certain courses.

Advising for students making adequate process is required at least once in every academic year, and a program of study for three terms is drafted in their folder. Screening for students not making adequate academic progress is done each term, and students not making adequate progress are required to see an advisor before they can register for the following term. The Head Advisor advises all students in academic difficulty. Other faculty may advise students making satisfactory progress.

Advising Transfer Students

Transfer students are accepted into the PRE-engineering program by University Admissions. They are accepted into the professional engineering program through the same process as OSU students, based on evaluation of their performance in the designated pre-engineering courses.

Their transfer coursework is not considered in their application to the professional program if they have grades at OSU in at least 5 required pre-engineering courses that they had not previously passed with a C- or better grade elsewhere.

To evaluate if the procedures for transfer students and non-transfer students were working, we examined the students entering the pre-engineering program in the Fall of 1998. These data are shown below. By the fall of 2001, 48% of the transfer students and 41% of the non-transfer students were admitted into the professional program. Comparing the grades of these two groups at OSU, we found that approximately 42-45% of the students in both groups had a GPA of greater than 3.0. In this case, there is not a significant difference between the transfer and non-transfer students.

	Number Fall 98	Pro by Fall 00	Graduated Sp 01	OSU GPA>3.0
Transfer	33	16 (48%)	9 (27%)	14 (42%)
NonTransfer	108	44 (41%)	0*	49 (45%)

* No students graduated in 3 years.

Validation of Coursework not at OSU

The Head Advisor evaluates coursework taken at other institutions. Catalog course descriptions for all universities are available from www.collegecatalogs.org.

When the Head Advisor is unable to determine whether a course is exactly equivalent to an OSU technical course, the student is asked to meet with the instructor of that course to evaluate his or her abilities. The instructor may review coursework, conduct an oral examination, or otherwise determine the equivalency. The instructor informs the Head Advisor of his or her determination. The student may be required to take an OSU course or to demonstrate in some other manner competency in any missing requirement.

To evaluate if our advising processes are working, we performed an exit survey of our graduating seniors in Spring 2001. We asked them what they appreciated about our advising process and what areas we needed to improve. These results are summarized in the table below.

Overall, the 75 students surveyed were very positive about advising. To address some of their concerns, we are instituting a training session for all faculty at the beginning of each year. It will be conducted by our head advisor at our faculty retreat before the fall term begins. This will be particularly important since many new faculty will be hired in the next several years. We will also continue to monitor how effective our advising is.

Appreciated about ECE advising	
Knowledgeable advisors	48%
Email reminders/mandatory advising	24%
One-to-one advising	28%

Needed Improvements in Advising	
Advisors more knowledgeable	38%
Advisors understand student interest	26%
Same advisor all year	24%
Incorporate career counseling	7%
Communicate what courses are important	5%

2. Program Educational Objectives

Oregon State University Mission Statement

Oregon State University aspires to stimulate a lasting attitude of inquiry, openness and social responsibility. To meet these aspirations, we are committed to providing excellent academic programs, educational experiences and creative scholarship.

The mission of the Electrical and Computer Engineering Department at Oregon State University is to *provide a comprehensive, state-of-the-art education that prepares our students to be successful in engineering practice and advanced studies*. This mission is consistent with the mission of the university and is supported by the following Program Educational Objectives (PEOs). After each PEO, it is also briefly described how the curriculum addresses this PEO.

1. Depth.

Graduates will develop an ability to identify, formulate, analyze and solve ECE problems by applying fundamental and advanced mathematical, scientific and engineering knowledge and skills. Modern engineering techniques, skills and tools (hardware and software) will be used, particularly recognizing the role that computers play in engineering. Students will develop the discipline required for lifelong learning.

Depth is addressed throughout the curriculum. It begins with the foundation in the freshmen year of mathematics, physics, and freshman ECE orientation and culminates with discipline specific electives and senior design in the senior year.

2. Breadth

Students will develop a broad understanding at a systems level as well as at a component level through authentic engineering experiences, including current issues in ECE as needed to understand the impact of ECE solutions in a global and societal context.

Breadth is also addressed throughout the entire curriculum. It is promoted through the non-ECE courses that students take in their undergraduate program including engineering science, liberal arts, and other chosen electives.

3. Professionalism

To be prepared for the complex modern work environment, students will build clear communication skills and responsible teamwork skills. They will develop project management capabilities, professional attitudes and understand ethical issues.

These skills are developed in laboratories in the freshman through senior years. Senior design (ECE 441, 442, 443) especially emphasizes communication and teamwork skills as well as project management and ethics. Many industry speakers in the senior design course sequence present professional attitudes and ethical issues in the engineering discipline.

4. Trouble-shooting (Also referred to as Problem Solving)

Through authentic engineering experiences in the curriculum, students will build an ability to integrate their knowledge and skills. They will develop solid engineering insight and judgment, including practice with trouble-shooting and with design to meet quality, reliability and manufacturing constraints.

Formal laboratories in ENGR 201, 202, 203, ECE 112, 272, 322, 323, 331*, 375, 391*, 441, 442, 443 provide the students with experience applying their theoretical knowledge to practical problems. The laboratories indicated with a * are not taken in the Computer Engineering Degree Program.

5. Community

Graduates will emerge as part of a professional and educational community, providing support for their own professional growth and development, as well as providing avenues for professional service in contributing to the growth and development of future engineers. The community will include pre-college, undergraduate and graduate students, faculty, practicing engineers, and other professionals, and will provide avenues for building mentoring, communication and networking skills, and appreciation and valuing of diverse perspectives.

This community of students, faculty and industry is encouraged by establishment of the industry partners program. The ECE department & the IEEE student chapter sponsors several events each year to promote this interaction. In the fall, a dinner is held where industry "buys" tables where students will join them for dinner and have opportunities for informal interaction. Typically 130 students participate in this event (seniors). This is followed by a career fair that all students may participate in. In the winter term, the department hosts a reception for approximately 200 students to interact with the industrial representatives. In the Spring term, ECE holds an open house to display the senior projects and display the freshman TekBots[1]. This is also open to the public. In addition to creating these industrial interactions, upper class students are also encouraged to be teaching assistants in the freshman robots course (ECE 112). This provides a distinct mentoring experience for the students in their junior/senior years.

6. Innovation

Graduates will gain a comprehensive engineering education from 1-5 above, providing the foundation for engineering intuition. Additionally, students will be encouraged to be innovative by fostering the excitement of discovery and associated creativity.
Laboratories throughout the curriculum promote the excitement of discovery and associated creativity. Students see first-hand how the engineering concepts come to life in many of their ECE laboratories. This is being further enhanced through the TekBots program.

These overall program objectives can be decomposed into specific outcomes that are used as a basis for assessment and evaluation of the program objectives. The first part of these outcomes relate directly to the general program outcomes (a)-(n) whereas the remaining outcomes are ECE program specific, Table 1.

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[1] TekBots is a new program at OSU that uses a robot as a platform for learning. More explanation is provided in B.3.b.4.

Table 1: Program educational objectives and the associated outcomes.

Educational Objectives						*Outcomes*
Depth	**Breadth**	**Professionalism**	**Trouble-shooting**	**Community**	**Innovation**	
X						(a) Ability to apply knowledge of mathematics, science, and engineering to solve engineering problems
X						(b) Ability to design and conduct experiments as well as analyze and interpret data
X		X	X			(c) Ability to design a system, component, or process to meet desired needs
		X		X		(d) Ability to function on multidisciplinary teams
X			X			(e) Ability to identify, formulate, and solve engineering problems
		X		X		(f) Understanding of professional and ethical responsibility
		X		X		(g) Ability to communicate effectively
	X	X		X		(h) Broad education necessary to understand impact of engineering solutions in global/societal context
X				X		(i) Recognition of need for and ability to engage in lifelong learning
	X	X		X		(j) Knowledge of contemporary issues
X		X	X		X	(k) Ability to use techniques, skills and modern engineering tools necessary for engineering practice
X			X			(l) Knowledge of probability and statistics as applicable to ECE
X						(m-n) Knowledge of advanced mathematics (EE) or discrete mathematics (CpE) to solve related engineering problems
X	X					(o) Systems level understanding of processes
X						(p) Component level understanding
X			X		X	(q) The integration of system and component levels of understanding
X			X			(r) (o)[2] Ability to troubleshoot engineering problems
X						(s) Knowledge of the necessary software tools
X						(t) Knowledge of the necessary hardware tools and equipment
		X		X		(u) (p)[2] Ability to lead, mentor, and contribute to the development of future engineers
					X	(v) (q)[2] A fostered excitement of discovery and associated creativity

Program Constituents

[2] These outcomes are redefined later by the shaded letters shown for *o, p*, and *q*.

The constituencies for determining the program objectives are:

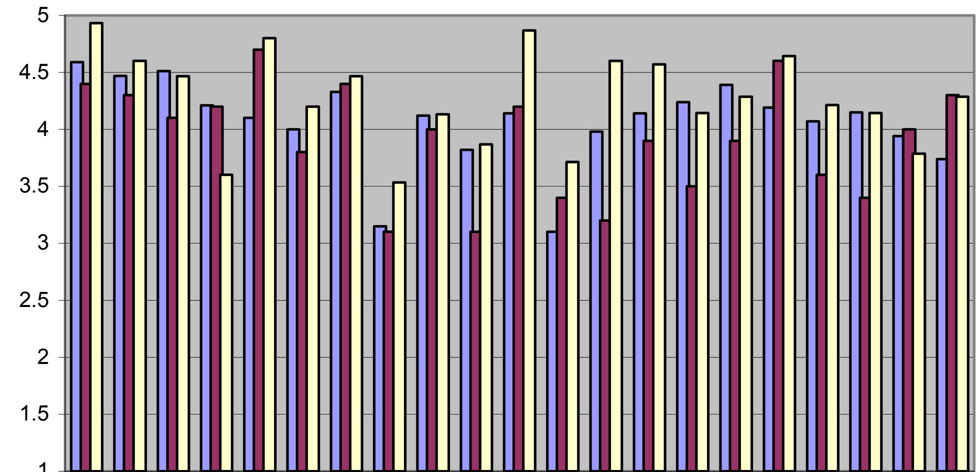
- Faculty
- Alumni
- Industry representatives

All of these constituents were involved in the definition and updating of the program objectives. The details of this involvement are summarized in the next section.

Process of Determining Program Educational Objectives

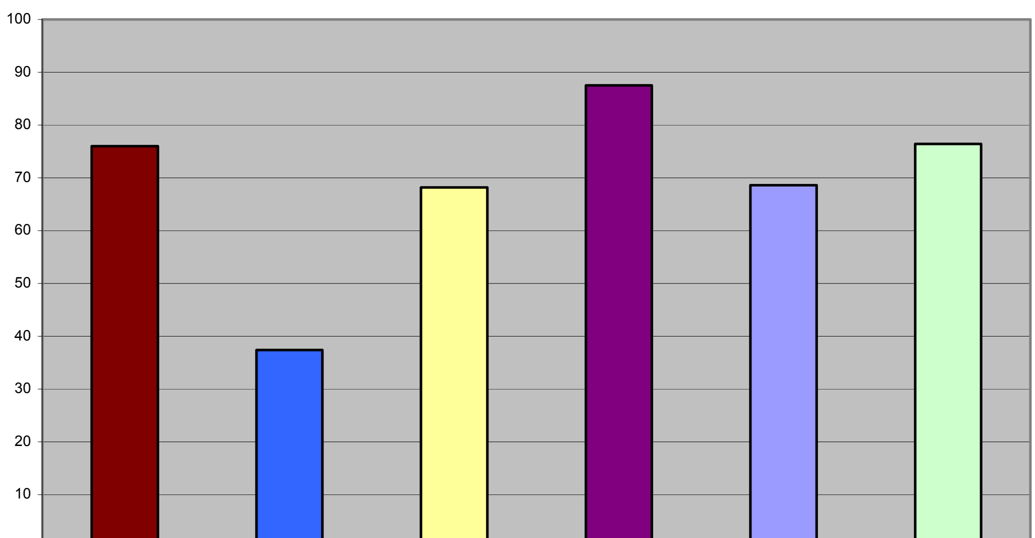
A draft of the PEOs was developed in the Winter term of 2000 by the ECE Curriculum and ABET committees based on the missions of the institution and the department. This draft was discussed with ECE faculty in a faculty meeting the Winter term of 2000. The program objectives were then presented to the Industry Advisory Board (IAB) that consists of industry representatives and alumni in May 2000. The PEOs were discussed in detail in a breakout session, the summary of this discussion is included the ABET2002 supplementary notebook. The summary of this discussion was made available to all the IAB members. The wording and content were changed based on the input of the industry members. The minutes of this meeting were circulated to the industry members for additional comments and no revisions were received. In Spring 2001, a survey of the graduates from 1998 was distributed to see how much emphasis they placed on these outcomes. In addition, a similar survey was given to the industrial advisory board at the Spring 2001 meeting to see how important the industry members felt these learning outcomes were. Figure 1 summarizes how important each program outcome is to the faculty, alumnus, and/or industrial member (or their company). The industry representatives scored almost all the items with an average score of 3.4 or higher except for “Broad education necessary to understand impact of engineering solutions in global/societal context”, “Knowledge of contemporary issues”, and “Knowledge of advanced mathematics (EE) or discrete mathematics (CpE) to solve related engineering problems.” The alumni rated the “Knowledge of advanced mathematics (EE) or discrete mathematics (CpE) to solve related engineering problems” much higher than the industry. The alumni also rated “Component-level understanding” much higher than the industry.

In the surveys, we asked our constituents which items were very important, important, or not important. We grouped the outcomes into PEOs and averaged the responses from the industry, alumni, and faculty that said the educational objective was very important. This graph is shown in Figure 2. It is widely recognized that depth, breadth and professionalism are very important. Our data also shows that our constituents rated ability to trouble-shoot, recognition of community and innovative aptitude as high or higher than the other three.



	a	b	c	d	e	f	g	h	I	j	k	L	m-n	o	p	q	r	s	t	u	v
Alumni-mean rating	4.59	4.47	4.51	4.21	4.1	4	4.33	3.15	4.12	3.82	4.14	3.1	3.98	4.14	4.24	4.39	4.19	4.07	4.15	3.94	3.74
Industry-mean rating	4.4	4.3	4.1	4.2	4.7	3.8	4.4	3.1	4	3.1	4.2	3.4	3.2	3.9	3.5	3.9	4.6	3.6	3.4	4	4.3
Faculty-mean rating	4.9	4.6	4.5	3.6	4.8	4.2	4.5	3.5	4.1	3.9	4.9	3.7	4.6	4.6	4.1	4.3	4.6	4.2	4.1	3.8	4.3

Figure 1: Survey results from industry (24), alumni (10 graduates from 1998) and faculty (15) assessing *importance* of outcomes. Average and standard deviation are shown for each group. A Scale of 1-5 was used where (1) is not important and (5) is very important.



	Depth	Breadth	Professionalism	Trouble-shooting	Community	Innovation
■	76	37	68	88	69	76

Figure 2: Average (in percentage) of industry, faculty and alumni constituents that rated the educational objective as *very important*.

After conducting these surveys and reviewing the results, we determined that several of our program specific outcomes were redundant. As a result, we have reduced our program specific outcomes down to three core outcomes that we intend to emphasize and improve over the course of the next several years:

o. Ability to troubleshoot engineering problems.

p. Ability to lead, mentor, and/or contribute to the development of future engineers.

q. A fostered excitement of discovery and associated creativity.

Process of Ongoing Evaluation and Assessment of Program Objectives

A system is currently in place for ongoing evaluation and assessment of the program objectives. The overall flow is depicted in Fig. 3 below where the loop for continuous improvement has been shown. The evaluation and assessment is based on surveys that are carried out on a regular basis. Industry members, alumni, and graduating seniors are the key constituents for this process. The inputs from these constituencies are passed on to the Curriculum Committee and the ABET Coordinators and appropriate changes are then enacted whenever deficiencies are found. Each year all graduating seniors are required to fill out a survey covering the assessment of our outcomes as well as other important characteristics of our program including advising. Industry and alumni will be surveyed every three years after the startup surveying of every year. The results of our assessment to date and changes that have been made are summarized in the following section. Realizing that 15-20% of our students go to graduate school, we intend to add questions to our senior exit survey about choices of graduate schools. Additionally, one year after starting graduate school, we will survey them on how well they were prepared and their performance in graduate school.

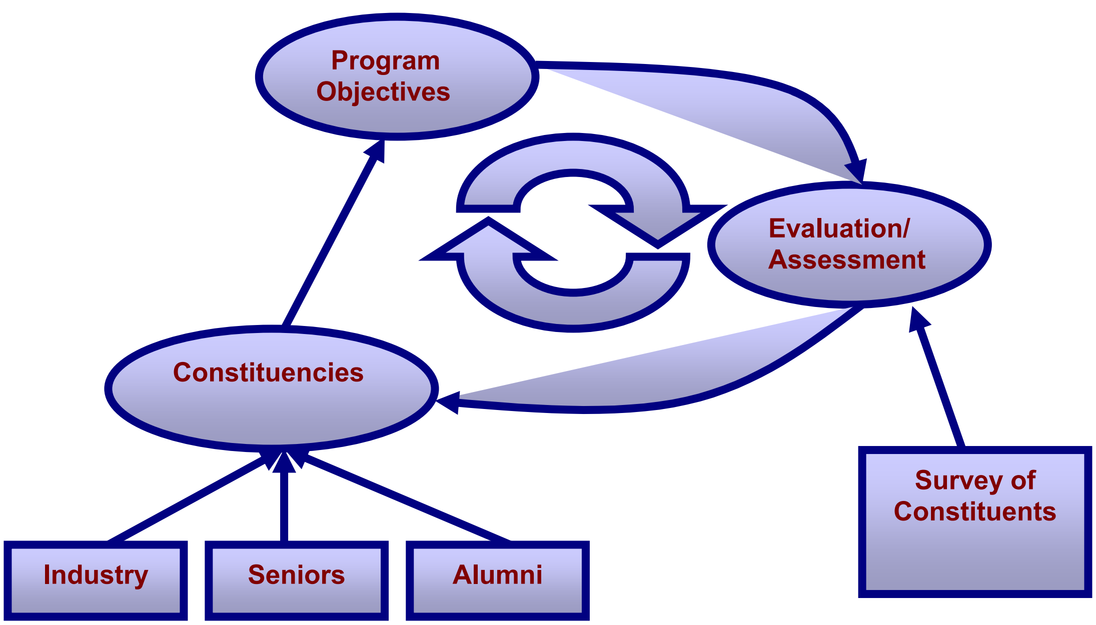


Figure 3: Process flow for assessment of program objectives.

3. Program Outcomes and Assessment

a. Program Outcomes and Educational Objectives

The Program Educational Objectives (PEO's) are mapped into the program outcomes in Table 1 and the Course Learning Objectives (CLO's) for each course (indicated on the ABET syllabus) are mapped to the ABET outcomes *a-n*. There are approximately four to eight CLO's, for each course in the departmental curriculum. The Program Outcomes/CLO's were established based on the Program Educational Objectives (PEO's) and ABET Outcomes *a-n*. The PEO's were created with the input and support of our constituents, are mapped to ABET *a-n*, and follow from the departmental and university mission. After one full cycle of assessment of our Program Outcomes/CLO's (2000-2001), it was determined that three outcomes (*o, p, q*) should be added in addition to the ABET *a-n*. How these three outcomes are addressed in our program is described in the program improvements section. The complete set of Program Educational Objectives and the corresponding ABET *a-q* Outcomes are summarized below.

Our **Program Educational Objectives** demonstrate a comprehensive educational experience for our students and are shown below with the associated ABET *a-q* mapping.

1. ***Depth*** (ABET Outcomes: a,b,c,e,i,k,l,m,n,o)
2. ***Breadth*** (ABET Outcomes: h,j)
3. ***Professionalism*** (ABET Outcomes: c,d,f,g,h,j,k,p)
4. ***Trouble Shooting*** (ABET Outcomes: c,e,k,o)
5. ***Community*** (ABET Outcomes: f,g,h,i,p)
6. ***Innovation*** (ABET Outcomes: k,q)

The corresponding **ABET *a-q* Outcomes** are:

Students graduating with a degree in electrical and electronics engineering and computer engineering have an:

a. ability to apply knowledge of mathematics, science, and engineering
b. ability to design and conduct experiments as well as analyze and interpret data
c. ability to design a system, component, or process to meet desired needs
d. ability to function on multidisciplinary teams
e. ability to identify, formulate, and solve engineering problems
f. understanding of professional and ethical responsibility
g. ability to communicate effectively
h. broad education necessary to understand impact of engineering solutions in global/societal context
i. recognition of need for and ability to engage in lifelong learning
j. knowledge of contemporary issues
k. ability to use techniques, skills and modern engineering tools necessary for engineering practice
l. knowledge of probability and statistics, including applications to electrical/computer engineering
m. knowledge of mathematics, basic sciences, and engineering sciences, necessary for analysis and design appropriate to electrical/computer engineering
n. knowledge of advanced mathematics (EE)/discrete mathematics (CpE)
o. ability to troubleshoot engineering problems
p. ability to lead, mentor, and contribute to the development of future engineers
q. fostered excitement of discovery and associated creativity

Tables 2 and 3 show how the CLO's for each course in the Electrical Engineering curriculum and the Computer Engineering curriculum, respectively, map to ABET *a-n*, demonstrating a comprehensive coverage of the ABET Outcomes *a-n* throughout both of the curricula. As described above, our initial mapping included only ABET *a-n*. After reviewing the surveys from the alumni, industry and graduates, *o-q* were added. The details of how ABET *o-q* will be addressed in the curriculum are addressed in the program improvements subsection.

Table 2: Electrical and Electronics Engineering Curriculum mapping to ABET a-n.

EE COURSE CURRICULUM	**ABET OUTCOMES (a-n)**													
	a	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**	**l**	**m**	**n**
ECE 111: ECE Tools	X	X	X	X		X	X			X	X		X	
ECE 112: ECE Concepts	X		X		X						X		X	
ECE 271: Digital Logic Design	X		X										X	X
ECE 272: Digital Logic Design	X	X	X		X		X				X			
ECE 317: Electr. Matl & Devices	X	X	X								X			
ECE 322: Electronic Circuits	X	X	X								X			
ECE 323: Digital Electronics	X	X	X								X			
ECE 331 Elect-Mech. Energy Conv.	X		X		X						X			
ECE 351: Signals & Systems I	X	X	X								X			
ECE 352: Signals & Systems II	X	X	X								X			
ECE 375: Comp Org. & Sys. Design	X		X		X				X	X	X			X
ECE 390: Electr. & Mag Fields	X		X		X								X	X
ECE 391: E & M Transmission Lines	X		X		X						X		X	X
ECE 417: Basic Semiconductor Devices	X		X		X		X				X		X	X
ECE 418: Semiconductor Processing	X	X	X				X							
ECE 422: Analog Integrated Circuits	X	X	X					X	X	X	X			
ECE 423: Digital Integrated Circuits	X	X	X								X			
ECE 428: Data Acquisition	X	X	X		X			X	X	X	X			
ECE 431: Power Electronics	X		X					X	X	X	X			
ECE 432: Electromechanical Energy Conversion	X		X		X						X			
ECE 433:Power Systems Analysis	X		X		X			X	X	X	X			
ECE 441: Senior Design	X			X	X	X	X			X	X			
ECE 442: Senior Design	X			X	X	X	X			X	X			
ECE 443: Senior Design	X	X	X	X	X	X	X				X		X	
ECE 451:Control Engineering Design I	X		X		X		X				X		X	X
ECE 452: Control Engineering Design II													X	X
ECE 461: Probabilistic Methods in EE	X		X						X	X	X	X	X	X
ECE 462: Communications I	X								X	X	X	X	X	X
ECE 463: Communications II	X	X	X						X	X	X	X	X	X
ECE 464: Digital Signal Processing	X	X	X								X			
ECE 465: Computer Networks & Protocols	X		X					X	X	X	X		X	X
ECE 471: Advanced Digital Design	X	X	X							X	X			
ECE 472: Computer Architecture	X	X	X		X						X			
ECE 473:Microprocessor System Design	X		X		X				X	X	X			
ECE 474: VLSI System Design	X	X	X		X		X				X			
ECE 478: Computer & Network Security	X		X		X			X	X	X	X	X	X	X
ECE 482: Optical Electronic Systems	X	X	X	X	X		X		X	X	X			
ECE 485: Microwave Techniques	X	X	X		X								X	
ECE 499: Selected Topics in ECE/Multimedia	X		X		X					X	X		X	X
ENGR 201: Engineering Fund. I	X	X												
ENGR 202: Engineering Fund. II	X	X	X								X			
ENGR 203: Engineering Fund. III	X		X		X						X			

** Required courses are indicated in bold*

Table 3: Computer Engineering Curriculum mapping to ABET a-n.

CpE COURSE CURRICULUM	ABET OUTCOMES (a-n)													
	a	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**	**l**	**m**	**n**
ECE 111: ECE Tools	X	X	X	X		X	X			X	X		X	
ECE 112: ECE Concepts	X		X		X						X		X	
ECE 271: Digital Logic Design	X		X										X	X
ECE 272: Digital Logic Design	X	X	X		X		X				X			
ECE 317: Electr. Matl & Devices	X	X	X								X			
ECE 322: Electronic Circuits	X	X	X								X			
ECE 323: Digital Electronics	X	X	X								X			
ECE 351: Signals & Systems I	X	X	X								X			
ECE 352: Signals & Systems II	X	X	X								X			
ECE 375: Comp Org. & Sys. Design	X		X		X				X	X	X			X
ECE 390: Electr. & Mag Fields	X		X		X								X	X
ECE 417: Basic Semiconductor Devices	X		X		X		X				X		X	X
ECE 418: Semiconductor Processing	X	X	X				X							
ECE 422: Analog Integrated Circuits	X	X	X					X	X	X	X			
ECE 423: Digital Integrated Circuits	X	X	X								X			
ECE 428: Data Acquisition	X	X	X		X			X	X	X	X			
ECE 431: Power Electronics	X		X					X	X	X	X			
ECE 432: Electromechanical Energy Conversion	X		X		X						X			
ECE 433:Power Systems Analysis	X		X		X			X	X	X	X			
ECE 441: Senior Design	X			X	X	X	X			X	X			
ECE 442: Senior Design	X			X	X	X	X			X	X			
ECE 443: Senior Design	X	X	X	X	X	X	X				X		X	
ECE 451:Control Engineering Design I	X		X		X		X				X		X	X
ECE 452: Control Engineering Design II													X	X
ECE 461: Probabilistic Methods in EE	X		X						X	X	X	X	X	X
ECE 462: Communications I	X								X	X	X	X	X	X
ECE 463: Communications II	X	X	X						X	X	X	X	X	X
ECE 464: Digital Signal Processing	X	X	X								X			
ECE 465: Computer Networks & Protocols	X		X					X	X	X	X		X	X
ECE 471: Advanced Digital Design	X	X	X							X	X			
ECE 472: Computer Architecture	X	X	X		X						X			
ECE 473:Microprocessor System Design	X		X		X				X	X	X			
ECE 474: VLSI System Design	X	X	X		X		X				X			
ECE 478: Computer & Network Security	X		X		X			X	X	X	X	X	X	X
ECE 482: Optical Electronic Systems	X	X	X	X	X		X		X	X	X			
ECE 485: Microwave Techniques	X	X	X		X								X	X
ECE 499: Selected Topics in ECE/Multimedia	X		X		X					X	X		X	X
ENGR 201: Engineering Fund. I	X	X												
ENGR 202: Engineering Fund. II	X	X	X								X			
ENGR 203: Engineering Fund. III	X		X		X						X			

* *Required courses are indicated in bold*

b. Program Assessment

b.1. Overview

An assessment plan has been developed to ensure that graduates have achieved the Program Outcomes. The general assessment process flow chart is shown below in Fig. 4. The curriculum committee is at the heart of this assessment and improvement process. The committee is typically headed by the head undergraduate advisor and the ABET coordinators are active members of the committee. The curriculum committee monitors the surveys from the students, alumni and industry. They look for areas where improvement is needed. They also solicit input from the faculty on a regular basis to determine if other changes are needed in the program. Additionally, the Head Advisor meets with students on a regular basis so she also collects informal input that is provided to the curriculum committee. The six area committees within the department also provide suggested changed to the curriculum committee. Using these inputs, changes are identified and then either implemented after carefully evaluating the impact or the appropriate paperwork is developed and passed through the university curriculum change procedure.

Qualitative and quantitative data is provided for each class, each term, through the Course Assessment Forms in each of the ABET folders, to demonstrate that the graduates satisfy the Program Outcomes (Blank forms are provided in Appendix IB). This is in addition to the three (3) surveys conducted by the department as described below.

The Course Learning Objectives (CLO's) map into the outcomes and they are assessed for each class, each term by the instructor on a Course Assessment Form. Each of the CLO's has at least one indicator of how well the students were able to demonstrate that objective. For example, each CLO may be assessed through specific exam problems, homework problems, projects, labs etc. The professors detail the means of assessment, the average and high scores, as well as the score that would indicate a satisfactory demonstration of that CLO. Comments are included regarding which (if any) course learning objectives require attention, and how that will be addressed, related to ABET *a-n*. If there are action items on changing CLO's etc., a comment is made documenting the reason for the change and the data etc. used to make that decision.

The Course Assessment Form also includes a section where the class professors assess the student preparedness for their class at the start of the term. The professors assess skills such as: math, laboratory, problem solving, design skills as well as the capability of using the necessary tools (e.g. computer/software etc.). The professors determine the approximate percent of the class whose preparedness met with the prerequisite expectations. In this way, problem areas are identified and the professor takes action with the appropriate prerequisite class to ensure that the appropriate communication is established, expectations are understood, and problem areas are corrected. The comments and actions are all documented in the appropriate section on the Course Assessment Form.

Course instructors conduct the assessment of how well the students are able to demonstrate Course Learning Objectives (CLO's), as well as student preparedness coming into the class, and document this on Course Assessment Forms, for each term a course is taught. Comments are made regarding any action items that should be taken to further develop and improve the course and program. The Course Assessment Forms are forwarded to the ABET coordinators, and discussed with the corresponding Area Group to ensure appropriate communication and discussion of the action items, as indicated in Fig. 4. Note: Each Area Group has designated courses that they are responsible for in our curriculum. The ABET coordinators document the planned action items for the department and work with the curriculum committee where approval is necessary. To ensure the action items are carried out, the ABET coordinators require the Area Groups to summarize how the action items were accomplished, and this is documented in the corresponding course folders on Summary of Action Item Implementation Forms (Blank Summary of Action Item Implementation Forms are given in Appendix IB). The schedule for the ABET outcomes assessment and implementation for 2001-2 is provided in Table 4. At the end of each quarter, the action item summary is discussed at a faculty meeting. This process ensures that the loop is closed for process improvement.

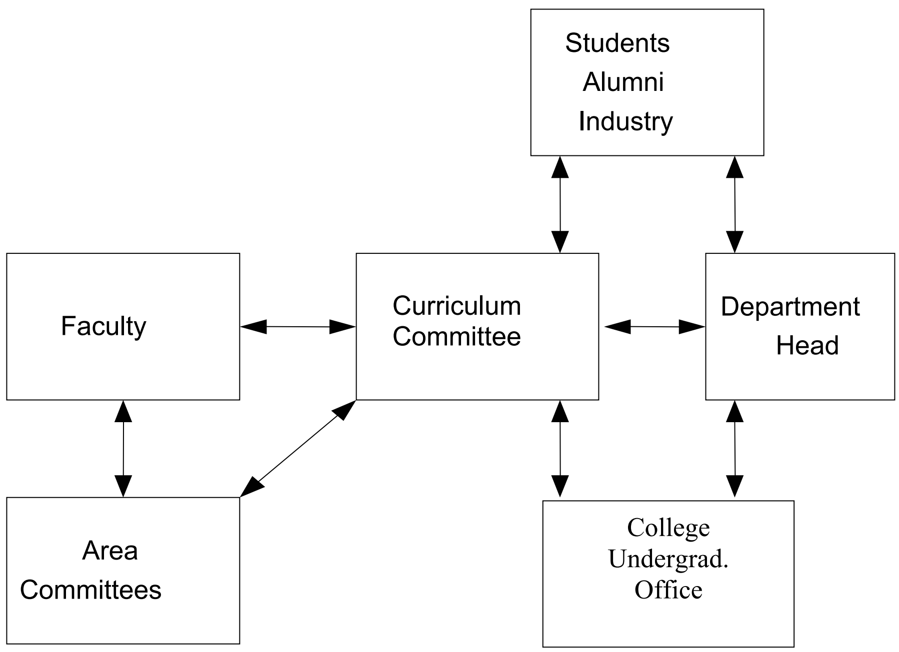


Figure 4: ECE Program Assessment Process Flow Chart.

Table 4: ECE Schedule for ABET Outcomes Assessment and Implementation, For 2001-2002 Academic Year

Activity	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Comments
Coordinate with CoE ABET Committee	--	--	--	--	--	--	--	--	--	--	--	--	Ongoing
Write ABET Self Study		X--	--	--	--	--	--	--	--X				1st draft complete Nov. 2001
Actions to Improve Program													
Ensure completeness of ABET Course Folders for 2000 – 2001 academic year	X--	--	--X										Led by ABET Coordinators
Share Assessment Results with Faculty, Area Groups meet and discuss appropriate Action Items			X										At Faculty Retreat
Faculty address course needs and course coverage			X--	--	--	--X	X--	--	--X	X--	--	--X	Through Course Assessment Process/Forms
ABET Coordinators Monitor Assessment Process, Update and Coach Faculty on Requirements	--	--	--	--	--	--	--	--	--	--	--	--	Ongoing
Curriculum Committee addresses approval issues	--	--	--	--	--	--	--	--	--	--	--	--	Ongoing
Area Groups Summarize Action Item Implementation to "Close Loop" on Assessment Process			X			X			X			X	Through Action Item Implementation Forms, at Faculty Meetings
Industrial Advisory Board addresses assessment and program mission and objectives										X			Includes Employer Survey
Assessment Process													
Course Assessment: Student Preparedness and CLO assessment			X--	--	--	--X	X--	--	--X	X--	--	--X	Through Course Assessment Form
Collect course material with solutions used in CLO Assess.			X--	--	--	--X	X--	--	--X	X--	--	--X	Submitted to ABET Coordinators, end of term
Collect sample student work (A and C quality)			X--	--	--	--X	X--	--	--X	X--	--	--X	Submitted to ABET Coordinators, end of term
Alumni Survey								X					Hardcopy and Web
Exit Survey					X--	--X		X--	--X		X--	--X	Tied to Graduate Audit Process

X indicates the beginning of an activity and – indicates continuation of an activity. Activities that happen one time are indicated by X only.

b.2. Program Outcome and Assessment Materials for Review

The materials that will be available for review during the visit to demonstrate achievement of the Program Outcomes and Assessment include: Comprehensive ABET course folders (contents detailed below), target ABET Outcome folder (also detailed below), the original and results of the three (3) surveys: 1) Graduating Senior Exit Survey, 2) Alumni Survey (3 years post graduation), 3) Employer Survey assessing their ECE graduates.

The comprehensive ABET course folders contain:

- ABET Syllabus detailing CLO's mapped to ABET a-n, as well as other non-term specific course details such as textbook, topics and weekly course structure.
- Term Specific Syllabus.
- Course Assessment Forms.
- Summary of Action Item Implementation Forms.
- Instructional material and solutions (exams, homework, projects, labs) used for evaluation of CLO's.
- Sample "A" and "C" work used for each CLO assessment.

The target ABET Outcome folder contains:

- Course Assessment and improvement documentation, as well as Exit, Alumni, and Employer Survey results.
- Documentation of meetings with industry representatives.

b.3. Application of Assessment Data

Crucial program assessment feedback is obtained from the students, alumni, and industrial affiliates, as indicated at the top of the assessment process flow chart shown in Fig. 4. The department conducts three (3) types of surveys (provided for ABET) to assess how well graduates have achieved the program outcomes: 1) Graduating Senior Exit Survey, 2) Alumni Survey (3 years post graduation), 3) Employer Survey (obtained through the advisory board) assessing their ECE graduates. These surveys assess the achievement of both the ABET Outcomes *a-n* directly, as well as the Program Educational Objectives (PEO's). Figure 4 indicates the flow of information through the departmental and college personnel. Table 4 gives the departmental schedule for the ABET outcomes assessment and implementation process for the 2001 – 2002 academic year.

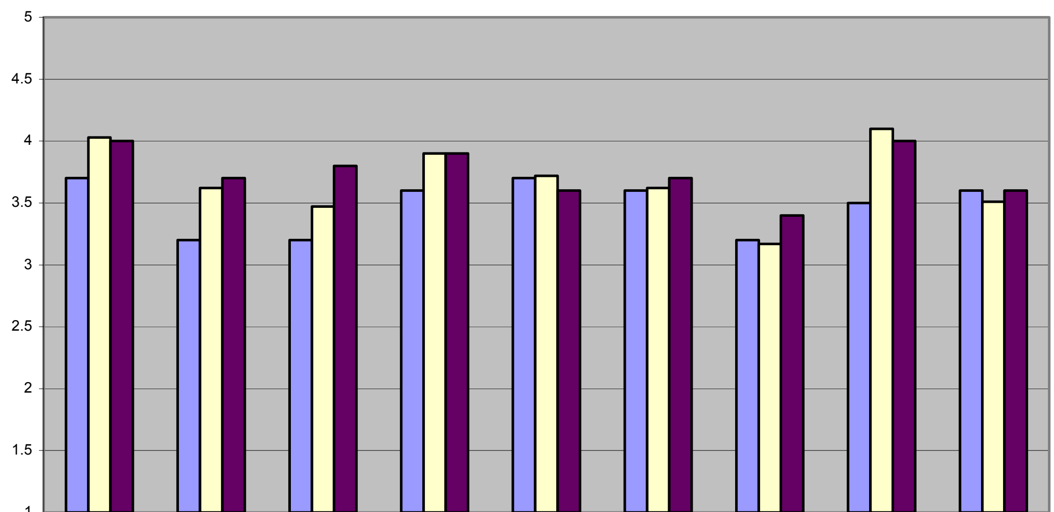
The results from the surveys carried out in Spring 2001 are shown in Figs. 5 and 6 and are grouped by program outcomes. The IAB members (24 total), 1998 alumni (10 returned surveys), and 2001 graduating seniors (75 total) were asked to rate how well the program objectives were met by graduates of the ECE program. The outcomes were scored on a scale of 1 (not prepared) to 5 (well prepared). The overall scores range from 3.1 to 4.0. Figure 5 represents the assessment of depth and

Fig. 6 displays the results for the other five program outcomes. On over half the depth-related outcomes, our graduates were rated above 3.5 on a scale of 5.0.

An interesting observation in these data are that the graduates of 2001 rated nearly every outcome higher than our industry evaluators or our 1998 graduates. Because we do not have data from previous senior classes, we do not know if this is a change or not. However, we have made significant changes since the beginning of Fall 1999 which may have resulted in higher overall scores and these changes will be highlighted later.

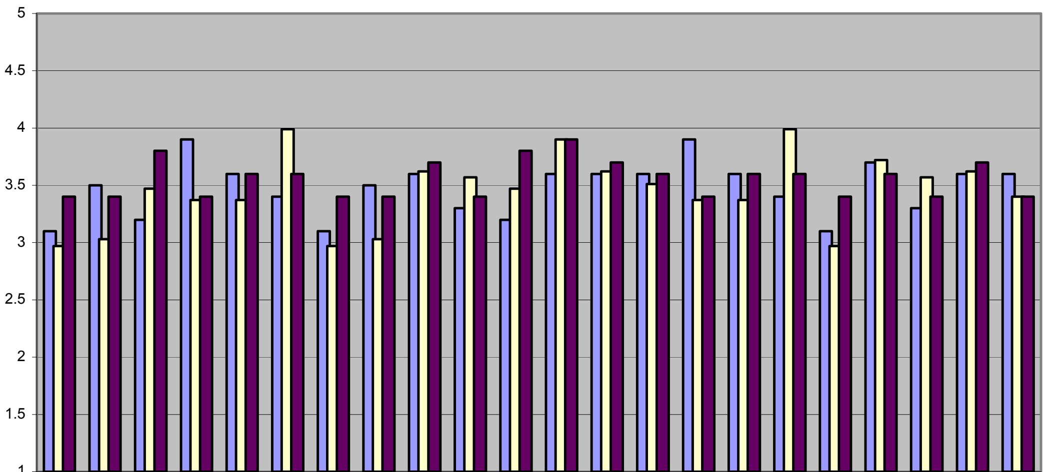
Figure 7 represents the average of the ABET outcome assessment for the six program educational objectives. Breadth has the lowest average but was also rated as the least important by our constituents. Professionalism, community, and innovation were the next lowest rated. Some discrepancy exists between the alumni and the recent graduates. This may be due in part to insufficient samples of the alumni where only 10 returned surveys out of the 60 graduates. Conversely, all 75 graduates in the spring of 2001 filled out an exit survey.

Overall, our goal is to increase the program educational objective score to greater than 4.0 out of 5.0. In the following sections, we will describe changes we are making based on this input to try to improve our overall program and assessment.



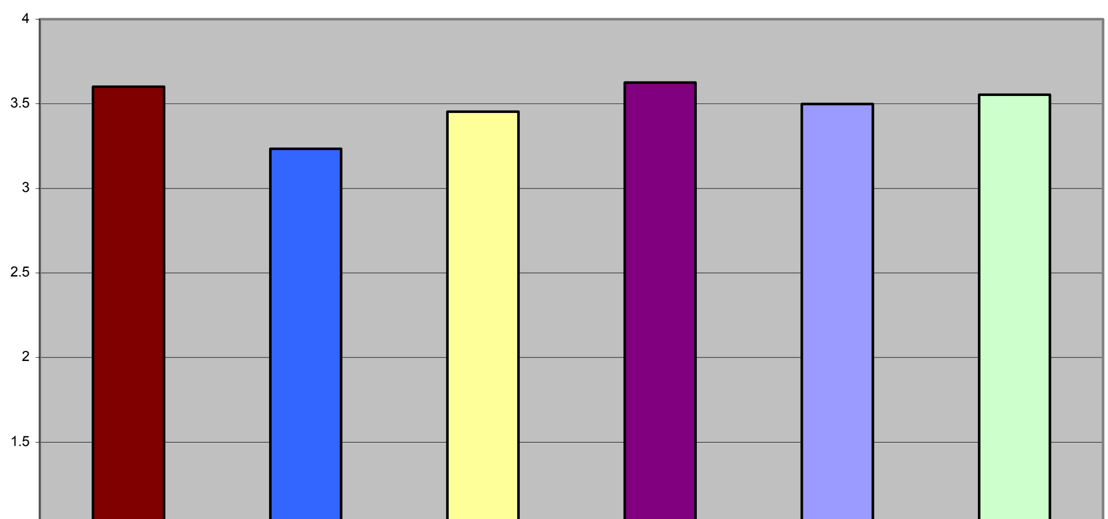
	a	b	c	e	I	k	L	m-n	o
Industry-mean rating	3.7	3.2	3.2	3.6	3.7	3.6	3.2	3.5	3.6
Alumni-mean rating	4.03	3.62	3.47	3.9	3.72	3.62	3.17	4.1	3.51
Exit-mean rating	4	3.7	3.8	3.9	3.6	3.7	3.4	4	3.6

Figure 5: Industry, alumni, and 2001 graduate survey results on assessment of <u>Depth</u>.



	h	j	c	d	f	g	h	j	k	p	c	e	k	o	d	f	g	h	l	p	k	q
	Breadth		Professionalism								Trouble-shooting				Community						Innov ation	
Industry-mean rating	3.1	3.5	3.2	3.9	3.6	3.4	3.1	3.5	3.6	3.3	3.2	3.6	3.6	3.6	3.9	3.6	3.4	3.1	3.7	3.3	3.6	3.6
Alumni-mean rating	2.97	3.03	3.47	3.37	3.37	3.99	2.97	3.03	3.62	3.57	3.47	3.9	3.62	3.51	3.37	3.37	3.99	2.97	3.72	3.57	3.62	3.4
Exit-mean rating	3.4	3.4	3.8	3.4	3.6	3.6	3.4	3.4	3.7	3.4	3.8	3.9	3.7	3.6	3.4	3.6	3.6	3.4	3.6	3.4	3.7	3.4

Figure 6: Industry, alumni and 2001 graduate survey results on assessment of breadth, professionalism, trouble-shooting, community and innovation.



	Depth	Breadth	Professionalism	Trouble-shooting	Community	Innovation
■	3.6	3.2	3.5	3.6	3.5	3.6

Figure 7: Average of Alumni, industry and 2001 graduating senior responses for the program outcomes.

b.4. Program Improvements

As described in the assessment process above, Course Assessments are conducted each term for each class, and action items are determined. To ensure the "loop is closed", the area group meets and puts together a summary of how the action items were carried out. This is documented in the course folders on the Summary of Action Item Implementation Forms and is summarized in Appendix IC.

A common outcome from the Course Assessment is that the faculty is gaining an understanding for the most appropriate time allotment for covering their CLO's and the effect of trying to cover too much material at the tail-end of the course and having some CLO's suffer. The professors are now making concerted efforts to reorganize their course material to ensure proper coverage of all CLO's.

In addition, in some cases the formal Course Assessment process helped professors identify more appropriate CLO's for their courses. Examples of more detailed changes implemented in *some* of our key courses as a result of the Course Assessment process are contained in the target ABET outcome folder, in each of the course folders and in Appendix IC.

These course specific changes are important for continuous improvement of each course. We have found this effort very helpful especially for ensuring consistency for courses taught by more than one instructor.

Ultimately our constituents will determine whether individual course or program changes have improved the educational experience. Thus, our surveys play an important role in determining how the overall program can be improved. Using the survey results shown in Figs. 5 and 6, we have selected the outcomes for which our graduates were not rated as highly. In general, if one or two of our constituents rated our graduates below 3.5, we are examining this further for improvement. Below is the list of areas for improvement in our outcomes.

b (ability to design and conduct experiments as well as analyze and interpret data)
c (Ability to design a system, component, or process to meet desired needs)
d (Ability to function on multidisciplinary teams)
k (Ability to use techniques, skills and modern engineering tools necessary for engineering practice)
l (Knowledge of probability and statistics as applicable to ECE)
o (Ability to troubleshoot engineering problems)
p (Ability to lead, mentor, and contribute to the development of future engineers)
q (A fostered excitement of discovery and associated creativity)

Note that outcomes *h* and *j*, both indicators of breadth, were rated below 3.5. Since our constituents rated breadth as the least important of our program educational objectives, we will focus on these once we have fully addressed the other outcomes.

Each of these program outcomes is emphasized in a few key parts of our program. For the educational outcomes listed above these are:

b – (laboratories)
c – (senior design)
d – (senior design)
k – (senior design)
l – (probability and statistics)
o – (laboratories)
p – (extra-curricular activities, senior design, laboratories)
q – (laboratories, senior design, and class assignments)

These areas for improvement (senior design, laboratories and probability and statistics) as defined by our constituents match well with the areas the department head began targeting beginning in the fall of 1999. The need to improve in these areas was only *reinforced* by this formal process. The effect of many of the changes that were instituted beginning in the fall of 1999 will not necessarily be reflected in our assessment process for several years. As a result, our graduating seniors may be our best (early) measure of the impact of these changes.

When the current department head joined the department in the Fall of 1999, she spent the first nine months meeting with all the faculty, students and employers. She met with each faculty/instructor individually to discuss how things were going and setting aggressive yet obtainable goals. She visited many employers in Portland and solicited input on how the program could be improved. She also met informally with students to determine what their experience was like at OSU. From these discussions, she began to work with the faculty to put some immediate "programs" in place to address the issues brought up by the faculty, students and employers. Below is a description of many of the programmatic changes that have been or are being put into place in the undergraduate ECE program. We hope these changes will enhance the learning experience and create a community of committed students, faculty and industrial partners.

Anchoring the Program

One key strategy we have adopted in the last two years is to enhance the quality of our education through *anchoring*. The idea is to match our faculty talents with the curricular needs *at all levels* and in particular in the lower division courses. Additionally, once these "match ups" are deemed successful, these assignments are stabilized. This is intended to anchor the program in quality and send the message to students that we care about their success from the beginning.

Previously, teaching the freshmen or sophomore classes was viewed as a necessary evil, but with the recognition that it is a privilege to teach these courses, the faculty have taken ownership for their success. For example, in our freshmen ECE 112 course, Roger Traylor teaches the course and laboratory. The teaching ratings are consistently among the top 5% of courses taught in our department even though this is our second largest class (more than 200 students). The combination of Roger's 10 years at Intel and commitment to education provide a quality experience for the students.

At the sophomore level, we assigned Annette von Jouanne to teach and lead the ENGR 202 class. She maintains a top research program in power electronics and shares her enthusiasm for the subject with our students. She is able to bring many of her research experiences into the classroom and generate excitement for working in this field.

At the senior level, we shifted teaching assignments to ensure our students were exposed to the best people in the field. By assigning our top researchers (and teachers) in the field of analog IC design into the ECE 422/423 classes, we have increased the enrollment of this elective course from 35 in 1999 to 65 in 2000 and 85 in 2001.

One significant change we made in our teaching assignments was senior design (ECE 441, 442, 443). David Hackleman from Hewlett-Packard offered to help us make some changes to our senior design sequence beginning in the Fall of 1999. His more than 20 years as a project engineer/manager in industry is particularly valuable in this course. We have partnered him with Jimmy Eggerton who recently joined us after 25 years in industry. Jimmy is committed to working closely with all of the design teams and learning the names of every student in the class.

Overall, we made teaching assignment adjustments to more than 10 classes. The department head monitors the effectiveness of each instructor in their assigned classes. From both student comments and teaching evaluations, the teaching assignments remain the same or are adjusted to ensure quality instruction.

TekBots™: An Integrated Platform for Learning

This program was initiated to enhance a strong hands-on freshman course we have required for the last 4 years. In the freshman course (ECE112), each student builds a robot. The students gain hands-on experiences and develop confidence in their capabilities. Through the funding support of Tektronix, we are now going to use this "robot" as a platform for learning. As students progress through the curriculum, they will integrate their knowledge onto the robot. In many classes, they will add capabilities and features to their robot so that by the time they are seniors, they may have an internet controlled, wireless robot. We call this "TekBots" to acknowledge the support of Tektronix. We are also developing custom course materials and hardware that we hope to provide to schools throughout the nation. We are currently integrating this platform into our sophomore-level courses and next year we will include it in our junior-level courses.

TekBots will be integrated into ECE 112, ECE 272, ECE 375, ENGR 202, ENGR 203, ECE 322, 323, 351, 352, and various senior courses. We have redesigned the robot platform and restructured all the laboratories for ECE 112. Next we are restructuring the laboratories for ECE 272. After these are in place, we will revise the labs for ECE 375 and ENGR 202.

As we develop these labs, we are also trying to emphasize our three unique program educational objectives: trouble-shooting, community, and innovation. To enhance the trouble-shooting capability of our students, we are working with Tektronix engineers to identify a trouble-shooting process. We will assess the students' trouble-shooting capability at the beginning of ECE 112 and then provide them with a process to use throughout the term. At the end of the term, we will assess their ability to trouble-shoot. We will then continue to build on this in the other TekBots laboratories.

We will use the TekBots program also to emphasize community. Juniors and seniors serve as teaching assistants. In the process, they gain experience mentoring. Additionally, the freshmen feel very comfortable with the teaching assistants since they are close to their level. The upper class students develop their mentoring and leadership skills in the process. We hope to leverage this throughout the program.

Innovation is a strong emphasis in the TekBots program. On the new platform (robot), a bread board is incorporated so that students can customize their robot with innovations. We have provided projects on the web that freshmen can add to their robot. As students progress through the curriculum, we will give them more freedom to customize their robot.

Industry-Sponsored

In the fall of 1999, we began soliciting industry-sponsored projects for our senior design students. Students work in teams of four on the projects and a

Senior Projects

mentor is assigned from the company. We charge $3500 per project and use funding to pay for supplies for the project and also to upgrade and update undergraduate laboratories. We showcase these projects in our spring open house. The 120 students demonstrate their projects to our industrial advisory board and the community. One of the exciting things about this event is the enthusiasm it generates among the young kids who attend the open house. This year's event was May 7. Approximately 500 visitors from the industry and community attended the event. The seniors created posters that described their projects. They also had hardware demonstrations ready to show the visitors. The industrial advisory board (approximately 30 members) judge the event. At the end, prizes are given to the three best projects.

***Building Community** Through Strong Student Groups and Industry Connections*

The last two years, we have focused on creating a community among our students, faculty and the industry. This has included strengthening our IEEE student group and helping them to bring in industrial presenters. We have also created a new program, called INSPiRE. This is our industry affiliates program. We have initiated a banquet the night before the career fair with industry visitors and our seniors. We held the second annual banquet this year and again had 180 students, industry visitors and faculty attend.

Computer Engineering Curriculum Improvement

Industry, the faculty and our students expressed interest in updating our computer engineering curriculum. Working closely with our industrial advisory board, we have targeted 3 courses that are being updated (ECE 271, 272, 375). This began last fall with the improvements in ECE 271. Programmable logic devices were introduced along with CAD tools. This was enabled with a donation from Xilinx. We are working on changes to two other classes. This supported by a donation of 28 Ultra-10 workstations from Sun Microsystems.

Enhancement of the Learning Experience in Non-ECE Courses

Feedback from students, alumni and faculty has alerted us to the need to change two key classes offered by other departments in the university. Our students have lacked any linear algebra experience that is so critical for many areas within ECE. We have worked with the math department to modify our math offering to include linear algebra. This has resulted in a change from MTH 253 to MTH 306. Additionally, our students take statistics. In the past this has not covered random variables. Because this is needed for communications, we are working with statistics to make these changes. A new course is being planned specifically for ECE students.

4. Professional Component

Students begin taking courses in our program the first term of their freshmen year. In ECE 111, all ECE students are exposed to professional issues through modules that are presented to all students throughout the college. (Every introductory course within the college uses the same set of modules.) These modules were developed by a college committee in 1995 to ensure that all freshmen are exposed to uniform and comprehensive material. Topics covered include professionalism and ethics, web usage and using library resources, societal issues and general usage of the Unix operation system.

This course is followed by ECE 112. In this class, students learn the basics of electrical and computer engineering. Students build up their TekBots robot in the laboratory and perform experiments that reinforce the lecture material. Students are taught basic trouble-shooting skills and are mentored by juniors and seniors in the laboratory. Additionally, we provide opportunities for them to add innovations to their robot on their own.

In the sophomore year, engineering science skills in the areas of electric circuit analysis (ENGR 201, 202, 203) and logic circuits (ECE 271, 272) are covered. These are complemented by courses in physics and chemistry. Laboratory experiences in these courses develop skills in fabrication, instrumentation, teamwork, and project organization and documentation. They also introduce an appreciation for safety in the laboratory. Students are required to analyze, fabricate, test, and verify the performance of circuitry designed to meet a device specification.

By the third year, the technological maturity of the students allows a substantial component of engineering design to be combined with engineering science. Open ended projects appear more frequently in the lectures and laboratories of our courses in Electronic I (ECE 322) and Electronics II (ECE 323). In our course in computer structures (ECE 375), students use computer-aided design tools to design and simulate computer structures. In ECE 391, the EE students use software tools to design simple circuits such as matching networks and transmission line models. Some of these designs are tested in the associated laboratory. A course in engineering economics (ENGR 390) introduces the financial elements associated with engineering design. A course in statistics (currently ST 314 or ST 421) provides the framework for treating random events, electrical noise, component variability and error analysis.

In the fourth year, students select electives from among the senior level courses in ECE. Careful advising and required program planning during the junior and senior years assures that the selection of technical electives satisfies ABET requirements for engineering topics. Students in the Computer Engineering Degree program chose fewer electives since ECE 471, 472, 473 and 474 are all required.

The senior year also incorporates a year-long design project (ECE 441, 442, 443) that is the culminating design experience. Students working in small groups (typically 4 students) with faculty and industry mentors participate in a full range of design experiences involving the design process, oral and written communication, project management as well as professional issues in engineering. Typically, two-thirds of these projects are industry sponsored. An open house for industry representatives and community members in the spring show cases the completed projects.

Engineering topics include both engineering design and engineering science. Engineering topics are spread over the four-year curriculum. Table 1 in Appendix IA provides a summary of the basic-level curriculum and Table 2 in Appendix IA describes the course and section size summary for the ECE department. A complete set of ECE course syllabi are given in Appendix ID.

The EE and CpE degrees provide depth by means of technical electives (such as Computer Science and Mathematics) selected throughout the program and departmental electives selected at the senior year. The Department offers advanced undergraduate topics in the areas of communications, control and systems engineering, signal processing, power electronics and energy systems, microelectronics, computers, networking, security, microwaves, optics, integrated circuits, VLSI, and devices.

Mathematics and Basic Science

The Electrical and Electronics Engineering Program and Computer Engineering Program includes 53 hours of mathematics and basic sciences. This exceeds the 48 hours required by ABET. This includes calculus (MTH 251, 252, 306, 254, 255 – CpE students also take MTH 231), statistics (ST 421 or ST 314), differential equations (MTH 256), chemistry (CH 201, 202), physics (PH211, 212, 213, 314) and biology (BI 101, 102 or 103).

Probability and statistics (ST 421 or ST 314) is required for each student. Probability and statistics are used in several courses and are particularly important for the communication sequence (ECE 461, 2, 3). Partial differential equations are developed and used in ECE 390 and ECE 391 (EM and transmission lines). Complex variables are introduced in ECE 111 and used throughout the curriculum in courses in Electrical Fundamentals (ECE 112, ENGR 202, 203), Signals and Systems (ECE 351, 352), Control Engineering (ECE 451, 452). Linear Algebra is presented in Math 306 and used throughout the program.

Humanities and Social Sciences

The humanities and social sciences section of the curriculum consists of 24 hours of coursework. It conforms to ABET requirements for breadth and depth. The OSU Baccalaureate Core, required of all students, emphasizes creative thinking, world cultures, the arts and literature. The Baccalaureate Core requirement is consistent with the humanities and social sciences requirements specified in the ABET criterion. Students are required to select from an approved set of “perspective” courses in each of the five areas of “Western Culture”, “Cultural Diversity”, Literature and the Arts”, “Social Processes and Institutions” and “Difference, Power and Discrimination”. This assures breadth in the program.

The depth requirement is achieved with two upper division “synthesis” courses, selected from an approved set, in the areas of “Contemporary Global Issues” and “Science, Technology and Society” along with a sixth “perspective” course required by the department but not by the University) in any of these seven areas.

5. Faculty

The Department of Electrical and Computer Engineering includes faculty from both Electrical Engineering and Computer Engineering that provide instruction to students of both programs. All ECE courses are taught by tenured or tenure-track faculty, instructors or adjunct faculty – no graduate students teach courses in our curriculum. These faculty and instructors are supported in their courses by teaching assistants who help with grading and operating the laboratories.

The department currently has 20 full-time tenure track faculty and 2 full-time instructors. In any given year, the department has 2-3 part-time instructors whom we typically hire from the local industry. Additionally, we have adjunct faculty in Portland that teach (graduate) courses delivered to students in Corvallis. All full-time faculty members teach undergraduates at least one term per year. Of the 22 faculty and instructors, two joined the department after the fall of 1997 and seven others joined after 1999. We are currently searching for four faculty to occupy unfilled positions. The department has a strong commitment to quality teaching and research and as we hire faculty, we seek faculty who share our values.

Teaching loads are defined by the workload model in the College of Engineering. The teaching load of a particular faculty member depends on the level of research activity - determined primarily by research funding. Faculty with more than one-half of the college average of research funding ($170k/yr in 2001) teach 4 courses per year. With some research funding, their course load is decreased by one course. Faculty not involved in research teach 6-8 courses per year. The typical course load in the department is 4-5 courses per year. New tenure-track faculty typically have a reduced teaching loads for the first two years of three courses per year. Faculty have the option to release themselves from a course by paying the department with one-seventh of their 9-month salary plus benefits (33%). In any one year, typically 4-5 faculty will buy out of one course. The faculty workload summary in Appendix IA, Table 3 lists the faculty and their corresponding teaching assignment for 2001-2002.

All faculty participate in undergraduate advising except for the graduate advisor (John Wager). Molly Shor, the undergraduate head advisor, coordinates all of the advising. She has a half time position to orchestrate our advising and the other half of her time is taken up with research activities. Having a faculty member dedicated to advising has given us stability and quality in our advising.

With the addition of three new faculty members in 2001-2002, the department is getting to a more reasonable faculty size. Filling the four unfilled faculty positions will only enhance our ability to be attentive to the students in the program.

The overall competence of the faculty is very high. The diversity of backgrounds, academic training, teaching experience, scholarship, and participation in professional and technical societies is documented in the faculty resumes in Appendix IE and in Table 4 of Appendix IA. Below is a table summarizing the faculty expertise and teaching responsibilities.

Analog Mixed Signal Electronics	**Electronic Devices, Materials & Opto-Electronics**
Terri Fiez Leonard Forbes Kartikeya "Karti" Mayaram Un-Ku Moon Gabor C. Temes 322, 323, 422, 423, 428, ENGR 201	Thomas K. Plant S. “Mani” Subramanian John F. Wager 317, 417, 418, 482, 483
Communications & Controls	***Computer Engineering***
Jimmy Eggerton, 441, 442, 443 Wojtek J. Kolodziej Huaping Liu Luca Lucchese Mario Magaña Molly Shor 351, 352, 451, 452, 461, 462, 463, 464, ENGR 203	Otto Gygax, 111 Çetin Kaya Koç Ben Lee Shih-Lien Lu Wen-Tsong Shiue Alexandre F. Tenca Roger Traylor 271, 272, 375, 465, 471, 472, 473, 474, 478
Microwave Electronics	***Energy Systems/Power Electronics***
Raghu Settaluri Andreas Weisshaar 390, 391, 484, 485	Annette von Jouanne Alan Wallace 331, 431, 432, 433, ENGR 202

The faculty are committed to providing our students with quality and diverse educational experiences. In addition to interacting with students in their offices during office hours, more than half our faculty also have undergraduates involved in research. Because half of our research funding is from industry sources, many of these undergraduates interact with industry as a part of this research experience.

To promote faculty, student and industry interaction, the department has initiated several yearly events. We have a senior dinner the night before the career fair that industry representatives and faculty also attend. This is a formal yet informal setting for students, industry and faculty to sit down to dinner for a night. We have an open house event in February for interaction and then in the Spring; our industrial advisory board and faculty participate in judging the senior projects. All students are invited to attend.

We have also strengthened our IEEE student group. We have helped them develop a industry speaker series and provided new faculty leadership.

6. Facilities

Classrooms all across campus are used for instruction of ECE courses. All are adequate and equipped with the basic equipment needed for instruction including white or chalk boards and overhead projectors.

The format of many of our courses is a lecture three times a week accompanied by one 3-hour lab per week. In the labs, there are typically 20-24 students to a lab section. This allows for more individualized attention. We are constantly reviewing the relevance of our laboratories and the laboratory equipment. Table 5 summarizes our courses and the associated laboratory facilities and software usage in each of these laboratories. The laboratories include state of the art instrumentation , computers and software.

There are two ways we maintain the laboratory facilities and software licenses. One is a laboratory resource fee that is charged to students in the ECE program. Each year we collect approximately $75,000 that is used for computer support, laboratory supplies and equipment upgrades. In addition, we are charging $3500 for industry sponsored senior projects. This gives us an additional $15,000-$20,000 a year to invest in laboratories. We have also been fortunate to have strong industry support in terms of donations. In 1999, we received 12 laboratory stations from Intel and Tektronix ($100,000) for the communications and signal processing laboratory (including computers, oscilloscopes, function generators, power supplies and a couple spectrum analyzers). In 2001, Sun Microsystems dedicated a 25 seat Ultra-10 workstation lab to the department for general ECE use. Tektronix also donated over $65,000 in laboratory equipment in 2001 for the senior design lab and for adding seats to several other laboratories within the department. Recently, we have tried to standardize our labs to simplify the support of these labs.

On average, most of the computer and instrumentation laboratories must be upgraded every 3-4 years. With our student resource fee, industry sponsorship and donations, we are able to meet these needs.

The computing resources for undergraduates are provided centrally through the college of engineering. There are several PC and workstation laboratories throughout the college that all engineering undergraduates may access. These laboratories are upgraded every three years. They are funded through a combination of student resource fees and donations. Most recently, the college was awarded a large HP grant for workstations.

Table 5: Software and Laboratory description for each course in ECE.

Class	Primary Responsibility	Software	Lab Location	Seats	Area Sq. Ft.	Equipment
ECE 111	Gygax	Unix, Matlab	NA			
ECE 112	Traylor	Matlab, HSPICE	DB 302	22	1000	13-50MHZ scopes, 2-function gen., 23-sodering irons, 1-multimeters, 1-power supply
ECE 271	Tenca	Xilinx	NA			
ECE 272	Tenca	Foundation	DB 203	32	1100	16-PC's, 16-FPGA Boards
ENGR 201	Eggerton	SPICE	DB 120	8	1000	18-DMMS, 8-power supplies, 8-60MHZ scopes, 8-funct gens, 8-PC's
ENGR 202	von Jouanne	SPICE	DB 120	8	1000	18-DMMS, 8-power supplies, 8-60MHZ scopes, 8-funct gens, 8-PC's
ENGR 203	Magana	SPICE	DB 120	8	1000	18-DMMS, 8-power supplies, 8-60MHZ scopes, 8-funct gens, 8-PC's
ECE 317	Subramanian	NA	NA			
ECE 322	Mayaram	SPICE	OH 233	10	900	
ECE 323	Moon	Matlab, SPICE, Cadence	OH 233	10	900	
ECE 331	Wallace	Matlab, SPICE	DB 3	12	1500	3-M-G sets, 3-power analyzers, 3-transformers
ECE 351	Kolodziej	Matlab	NA			
ECE 352	Kolodziej	Matlab	NA			
ECE 375	Koc	Assembly Lang. Prog .for 8051	EDU 126 MCC 201	25		25-PC's
ECE 390	Settaluri	Matlab	NA			
ECE 391	Weisshaar	ADS, SPICE, Matlab	DB 9	12	800	4-PC's, 2-100MHZ scopes, 1-pulse gen, 1-multimeter counter, 2-signal gens., reflectometer, cable tester, model transmission line, XY pen plotter
ECE 417/517	Wager	HSPICE, Silvaco	NA			

ECE 418/518	Subramanian	Silvaco	DB 312			Fabrication Lab
ECE 422/522	Mayaram	SPICE	NA			
ECE 423/523	Moon	SPICE, Mentor Graphics	NA			
ECE 428/528	Temes	Matlab, Labview	OH 233	10	900	13-function gens., 10-power supplies, 12-100MHZ scopes, 13-DMM's, 11- PC's
ECE 431	von Jouanne	MatLab, SPICE	DB 5	16	550	4-oscilloscopes, 4-power supplies, 4-funct. gen.
ECE 432/532	Wallace	MatLab, Simulink	DB 3	12	1500	3-M-G sets, 3-power analyzers, 3-transformers
ECE 433/533	von Jouanne	Matlab	NA			
ECE 441/2/3	Eggerton	SPICE, Microsoft Office, Java	OH 337	12	900	10-100MHZ scopes, 12-PC's, 11-power supplies, 12- funct. gens.
ECE 451/2	Shor	(ME)	(ME)			ME 430/43 Lab
ECE 461/561	Magana	Matlab, Simulink, SystemView	OH 337	12	900	10-100MHZ scopes, 12-PC's, 11-power supplies, 12- fucnt. gens.
ECE 462/562	Magana	Matlab, Simulink, SystemView	OH 337	12	900	10-100MHZ scopes, 12-PC's, 11-power supplies, 12- fucnt. gens.
ECE 463/563	Magana	Matlab, Simulink, SystemView	OH 337	12	900	10-100MHZ scopes, 12-PC's, 11-power supplies, 12- fucnt. gens.
ECE 464/564	Liu	Matlab	NA			
ECE 465/565	Lee	C progr. & Socket progr.	NA			
ECE 471/571	Tenca	Mentor Graphics Tools	NA			
ECE 472/572	Traylor	Mentor Graphics Design Architect, Quick Sim	NA			
ECE 473/573	Shiue	Mentor Graphics, Design Architect,	DB 203	32	1100	12-PC's, 6-UNIX workstations, 11-60 MHZ scopes, 10-Power supplies, 8-funct. gens., 1-EE prom programmer, logic analyzer

		XASM, SIM				

ECE 474/574	Traylor	Modd Sim, Vcom, Vsim, Leonardo Spectrum	NA			
ECE 478/578	Koc	NA	NA			
ECE 482/582 & ECE 483/583	Plant	MS Office, Matlab	DB 300	9	1000	Mercury vapor laser, 3-optic power meters, infrared viewing scope, 7-100MHZ scopes, multimeter, 4-Hene lasers, 1-Fabry Perot, 1-Bean Scan, 1-monochrometer, 1-power supply, 1-lock-in amplifier, fiber optics tools, couplers, lenses, fiber, 6-boxes (w/ signal gen., multimeters, power supplies), 3 digital 100 MHZ scopes, CCD camera & monitor, 2-stereo microscopes, 4- fiber optic OTDR's, 6-floating optical tbls., 3-analog 100 MHZ scopes, 3-Newport fiber optic kits, various LEDs & diode lasers
ECE 484/584	Weisshaar	Matlab	NA			
ECE 485/585	Settaluri	ADS, Matlab	NA			

7. Institutional Support and Financial Resources

Each biennium, the legislature funds the state institutions in Oregon. Once, the university budget is established, it is distributed among the colleges. Typically, the funding is awarded based on the previous years funding. In 1999, the legislature provided targeted funding for engineering so that we could increase the number of graduates. This resulted in funding for 3 additional faculty in ECE for the 99-00 biennium. In the 01-02 biennium, the legislature funded 3 more faculty for increased graduates and 2-3 for our top-25 initiative. While we have received a budget for 01-02, the legislature will be reconvening in January to address the $850M shortfall. It is not clear how this will affect our funding at this time. However, the positions described above that are unfilled are not part of this new funding.

The allotted state funding is approximately $2.3M. On top of this are added student resource fees ($75k), new positions through the legislature ($900k) for a total of approximately $3.5M/year. Our research funding from grants and contracts is slightly less than $3M/year. The increase in funding came at a critical time since the department went from 27 faculty in 1999 to 25 in 1996 to 20 in 2000. This increase in funding will allow us to get back to adequate levels for our increasing student numbers.

We have an aggressive fund raising campaign on-going. It is the number one priority within the university and we have a goal of $120M in private funding for the college of engineering. The Departments' scholarship endowment was doubled this year through a donor gift of $1.8M. We are also seeking endowed professorships.

One strength within the college is our strong leadership. With the leadership of Dean Ron Adams, we have clearly defined goals and have mapped out the necessary steps to achieve these goals. The progress so far has been outstanding. We have had a 50% increase in our research funding in 3 years and, at the same time, our teaching ratings college-wide have also increased. The president of the university has acknowledged publicly that engineering is the number one priority within the university.

Faculty members are encouraged to regularly attend professional conferences, workshops, and symposia. Travel funds are available through startup packages and a small portion is available within the department. Faculty members are expected to maintain active sponsored research programs to pay for most of their travel. One day a week is available for consulting and faculty may apply for sabbatical once every six years. Each year the department has a faculty retreat. This year, we began a new tradition of emphasizing areas for improvement. We had a morning session facilitated on teaching large classes. We chose a very successful member of our staff to lead this discussion (Roger Traylor). Many faculty commented that it was very valuable to hear new ideas for more effective classroom instruction. In the afternoon, we had two successful researchers within the college talk about creating top-25 research programs. This was very helpful to both new and seasoned faculty. We will use this format in future years since it was well received.

In the department, we have several support staff. This includes 4.5 FTE office staff, 1.5 FTE computer systems staff, and 2 technicians (although one is dedicated to the college shops that are run through the department and the other supports research approximately half of the time). We have a vacant position for an accountant at this time and, with this position, we are adequately staffed.

The complete description of the support expenditures of ECE is given in Table 5 of Appendix IA.

8. Program Criteria

The additional ABET program criteria specified for programs with the electrical and computer modifier in their title are satisfied by the Electrical and Electronics Engineering curricula and Computer Engineering curricula, respectively. Below, these program criteria are listed along with a brief summary of how they are satisfied by the programs of study.

"The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program."

The Electrical and Electronics Engineering program and the Computer Engineering program include breadth of electrical engineering topics including Devices, Circuits and Electronics (ENGR 201, 202, 203, ECE 317, 322, 323), Electromagnetics (ECE 390, 391)[3], Computer Engineering (ECE 271, 272, 375), Signals and Systems (ECE 351, 352), and Energy Systems (ECE 331)[3]. Depth in one or more of the electrical engineering disciplines is provided through the 20 hours of technical electives. This allows for depth in each one of these areas. The Computer Engineering curriculum satisfies the depth requirement by requiring ECE 471, 472, 473, and 474.

"The program must demonstrate that graduates have: knowledge of probability and statistics including applications appropriate to the program name and objectives; and knowledge of mathematics through differential and integral calculus, basic sciences, computer science, and engineering sciences necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components, as appropriate to program objectives."

The Electrical and Electronics Engineering Program and Computer Engineering Program contain 53 hours of mathematics and basic sciences. This exceeds the 48 hours required by ABET. This includes calculus (MTH 251, 252, 306, 254, 255), statistics (ST 421 or ST 314), differential equations (MTH 256), chemistry (CH 201, 202), physics (PH211, 212, 213 & 314), and biology (BI 101, 102 or 103). Computer Science is covered formally in CS 151 and CS 161. Engineering design is used throughout the curriculum and is culminated in the capstone design course sequence ECE 441, 442, 443.

"Programs containing the modifier "electrical" in the title must also demonstrate that graduates have a knowledge of advanced mathematics, typically including differential equations, linear algebra, complex variables, and discrete mathematics."

The math classes (MTH 251, 252, 306, 254, 255, 256) cover calculus, differential equations, linear algebra. Students use calculus, differential equations and complex mathematics in electro-magnetics (ECE 390, 391), Signals and Systems (ECE 351, 352) and power systems (ECE 331). Computer Engineers also take discrete mathematics (MTH 231) and they use discrete mathematics in the digital classes including ECE 271, 272, 375, 471, 472, 473 and 474).

9. Cooperative Education Criteria

The Electrical and Electronics Engineering or Computer Engineering programs at Oregon State University do not have a required cooperative work element as part of the professional component.

10. General Advanced-Level Program

Accreditation of an advanced-level program is not being sought.

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[3] Not required for Computer Engineers.

Appendix I - Additional Program Information

A. Tabular Data for Program

Table 1. Basic level Curriculum for Electrical & Electronics Engineering

Table 1. Basic Level Curriculum for Computer Engineering

Table 2. Course and Section Size Summary

Table 3. Faculty Workload Summary

Table 4. Faculty Analysis

Table 5. Support Expenditures

B. ABET Forms
C. Summary of Corrective Action
D. Course Syllabi
E. Faculty Resumes

Table 1. Basic-Level Curriculum

(Electrical & Electronic Engineering)

Year; Semester or Quarter	Course (Department, Number, Title)	Category (Credit Hours)			
		Math & Basic Sciences	Engineering Topics Check if Contains Design (✓)	General Education.	Other
			( )		
Freshman Year	ECE 111: ECE Tools		3(✓)		
Freshman Year	ECE 112: ECE Concepts		3 (✓)		
Freshman Year	ECE 271/272: Digital Logic Design		4 (✓)		
Freshman Year	Math 251:Diff. Calculus	4	( )		
Freshman Year	Math 252: Int. Calculus	4	( )		
Freshman Year	Math 254: Vector Calculus	4	( )		
Freshman Year	Chemistry 201: Gen. Chemistry	3	( )		
Freshman Year	Chemistry 202: Gen. Chemistry	3	( )		
Freshman Year	Writing I (Skills)		( )	3	
Freshman Year	Physics 211: Gen Physics	4	( )		
Freshman Year	Lifetime Fitness (Skills)		( )	3	
Freshman Year	Computer Science 151: Intro to C Programming		4 ( )		
Freshman Year	(2) H&SS Perspectives		( )	6	
Sophomore Yr	Math 255: Vector Calculus	4	( )		
Sophomore Yr	Math 256: Diff. Equations	4	( )		
Sophomore Yr	Math 306: Matrix & Power Series	4	( )		
Sophomore Yr	Physics 212 : Gen. Physics	4	( )		
Sophomore Yr	Physics 213: Gen. Physics	4	( )		
Sophomore Yr	Biology/Lab (Biological Sciences)	4	( )		
Sophomore Yr	Engineering 201: Engr. Fund. I		3 (✓)		
Sophomore Yr	Engineering 202: Engr. Fund. II		3 (✓)		
Sophomore Yr	Engineering 203: Engr. Fund.		3 (✓)		
Sophomore Yr	Engineering 211: Statics		3 ( )		
Sophomore Yr	Engineering 212: Dynamics		3 ( )		
Sophomore Yr	Computer Science 161: Intro to Computer Science I		4 ( )		
Sophomore Yr	Writing II (Skills)		( )	3	
Sophomore Yr	Comm 111/114 (Skills)		( )	3	
Junior Year	ECE 317: Electr. Matl & Devices		3 (✓)		
Junior Year	ECE 322: Electronic Circuits		4 (✓)		
Junior Year	ECE 323: Digital Electronics		4 (✓)		
Junior Year	ECE 331 Elect-Mech. Energy Conv.		4 (✓)		
Junior Year	ECE 351: Signals & Systems I		3 (✓)		
Junior Year	ECE 352: Signals & Systems II		3 (✓)		
Junior Year	ECE 375: Comp Org. & Sys. Design		4 (✓)		

Junior Year	ECE 390: Electr. & Mag Fields		4 (✓)		
Junior Year	ECE 391: E& M Transmission Lines		4 (✓)		
Junior Year	Statistics 314	3	( )		
Junior Year	Physics 314: Modern Physics	4	( )		
Junior Year	Engineering 390: Engr. Economy		3 ( )		
Junior Year	(2) H&SS Perspectives			6	
Senior Year	(5) Technical Elective Courses		20(X)		
Senior Year	ECE 441,442,443: Senior Design		6 (✓)		
Senior Year	Engineering 311: Thermodynamics		3 ( )		
Senior Year	Restricted Elective		4 (X)		
Senior Year	(2) Synthesis Courses		( )	6	
Senior Year	Electives				1
Senior Year	(2) H&SS Perspectives			6	
TOTALS-ABET BASIC-LEVEL REQUIREMENTS					
OVERALL TOTAL FOR DEGREE					
PERCENT OF TOTAL					
Totals must satisfy one set	Minimum semester credit hours	32 hrs	48 hrs		
	Minimum percentage	25%	37.5 %		

Note that instructional material and student work verifying course compliance with ABET criteria for the categories indicated above will be required during the campus visit

Table 1. Basic-Level Curriculum

(Computer Engineering)

Year; Semester or Quarter	Course (Department, Number, Title)	Category (Credit Hours)			
		Math & Basic Sciences	Engineering Topics Check if Contains Design (✓)	General Education.	Other
			( )		
Freshman Year	ECE 111: ECE Tools		3(✓)		
Freshman Year	ECE 112: ECE Concepts		3(✓)		
Freshman Year	ECE 271/272: Digital Logic Design		4(✓)		
Freshman Year	Computer Science 151: Intro to C Programming		4( )		
Freshman Year	MTH 231: Discrete Math	4	( )		
Freshman Year	MTH 251: Diff. Calculus	4	( )		
Freshman Year	MTH 252: Int. Calculus	4	( )		
Freshman Year	MTH 254: Vector Calculus	4	( )		
Freshman Year	CH 201: Gen. Chemistry	3	( )		
Freshman Year	CH 202: Gen. Chemistry	3	( )		
Freshman Year	WR I (Skills)		( )	3	
Freshman Year	Lifetime Fitness (Skills)		( )	3	
Freshman Year	PH 211: Gen. Physics	4	( )		
Freshman Year	(3) H&SS Perspectives		( )	9	
Sophomore Year	MTH 255: Vector Calculus	4	( )		
Sophomore Year	MTH 256: Diff. Equations	4	( )		
Sophomore Year	MTH 306: Matrix & Power Series	4	( )		
Sophomore Year	ENGR 201: Engr. Fund. I		3(✓)		
Sophomore Year	ENGR 202: Engr. Fund. II		3(✓)		
Sophomore Year	ENGR 203: Engr. Fund.		3(✓)		
Sophomore Year	ENGR 211: Statics		3( )		
Sophomore Year	ENGR 212: Dynamics		3( )		
Sophomore Year	PH 212: Gen. Physics	4	( )		
Sophomore Year	PH 213: Gen. Physics	4	( )		
Sophomore Year	COMM 111/114		( )	3	
Sophomore Year	Computer Science 161		4( )		
Sophomore Year	Computer Science 162		4( )		
Sophomore Year	WR II (Skills)		( )	3	
Junior Year	ECE 317: Electr. Mat'l & Devices		3(✓)		
Junior Year	ECE 322: Electronic Circuits		4(✓)		
Junior Year	ECE 323: Digital Electronics		4(✓)		
Junior Year	ECE 351: Signals & Systems		3(✓)		
Junior Year	ECE 352: Signals & Systems		3(✓)		
Junior Year	ECE 375:Comp. Org. & Sys. Design		4(✓)		

Junior Year	Computer Science 261: Data Structures		4( )		
Junior Year	Computer Science 311: Operating Systems		4( )		
Junior Year	ECE/CS 300-level: Restricted Elective		3( )		
Junior Year	Biology/Lab (Biological Sciences)		4( )		
Junior Year	Statistics 314		3( )		
Junior Year	(3) H&SS Perspectives		( )	9	
Junior Year	ENGR 390: Engineering Economy		3( )		
Senior Year	ECE 441,442,443: Senior Design		6(✓)		
Senior Year	ECE 471: Advanced Digital Design		4(✓)		
Senior Year	ECE 472: Computer Architecture		4(✓)		
Senior Year	ECE 473: Microprocessor System Design		4(✓)		
Senior Year	ECE 474: VLSI System Design		4(✓)		
Senior Year	Computer Science 411: Operating Systems		4( )		
Senior Year	ECE /CS 400-level Restricted Elective		4( )		
Senior Year	Electives		( )		1
Senior Year	(2) Synthesis Courses		( )	6	
TOTALS-ABET BASIC-LEVEL REQUIREMENTS					
OVERALL TOTAL FOR DEGREE					
PERCENT OF TOTAL					
Totals must	Minimum semester credit hours	32 hrs	48 hrs		
satisfy one set	Minimum percentage	25%	37.5 %		

Note that instructional material and student work verifying course compliance with ABET criteria for the categories indicated above will be required during the campus visit.

Table 2. Course and Section Size Summary

(Electrical & Computer Engineering)

Course No.	Title	No. of Sections offered in Current Year	Avg. Section Enrollment	Type of Class[1]			
				Lecture	Laboratory	Recitation	Other
ECE 111	Introduction to ECE: Tools	1	221	100%			
ECE 112	Introduction to ECE: Concepts	1	179 (22)	50%	50%		
ECE 271/272	Digital Logic Design/Lab	1	279 (22)	50%	50%		
ENGR 201	Electrical Fundamentals I	3	166 (24)	50%	50%		
ENGR 202	Electrical Fundamentals II	2	113 (24)	50%	50%		
ENGR 203	Electrical Fundamentals	2	61 (24)	50%	50%		
ECE 317	Electronic Material & Devices	1	129	100%			
ECE 322	Electronic Circuits	1	119 (22)	50%	50%		
ECE 323	Electronics I	2	60 (18)	50%	50%		
ECE 351	Signals & Systems I	1	124	100%			
ECE 352	Signals & Systems II	1	118	100%			
ECE 375	Computer Organization & Assembly Language Programming	2	93 (25)	50%	50%		
ECE 390	Electric & Magnetic Fields	1	77	100%			
ECE 391	Transmission Lines & Electromagnetic Waves	1	67 (12)	75%	25%		
ECE 331	Electromechanical Energy Conversion	1	94 (12)	50%	50%		
ECE 441	Engineering Design Project	1	110	100%			
ECE 442	Engineering Design Project	1	112	50%	50%		
ECE 443	Engineering Design Project	1	110	100%			
ECE 417	Basic Semiconductor Devices	1	28	100%			
ECE 418	Semiconductor Processing	1	35 (13)	25%	75%		
ECE 422	CMOS Integrated Circuits	1	84	100%			
ECE 423	CMOS Integrated Circuits II	1	39	100%			
ECE 428	Data Converters	1	44 (20)	75%	25%		

ECE 431	Power Electronics	1	31 (22)	25%	75%		
ECE 433	Power Systems Analysis	1	13	100%			
ECE 451	Control Engineering Design	1	4	100%			
ECE 461	Communications I	1	31	100%			
ECE 462	Communications II	1	13	100%			
ECE 463	Communications III	1	11	100%			
ECE 464	Digital Signal Processing	1	21	100%			
ECE 465	Computer Networks & Protocols	1	55	100%			
ECE 478	Computer & Network Security	1	54	100%			
ECE 499	ST/Multimedia Systems	1	26	100%			
ECE 499	ST/Hybrid Electric Vehicles	1	53	100%			
ECE 471	Advanced Digital Design	1	61	100%			
ECE 472	Computer Architecture	1	85	100%			
ECE 473	Microprocessor System Design	1	67 (15)	50%	50%		
ECE 474	VLSI System Design	1	92	100%			
ECE 482	Optical Electronic Systems	1	34 (16)	75%	25%		
ECE 483	Guided Wave Optics	1	21	100%			
ECE 484	Antennas & Propagation	1	28	100%			
ECE 485	Microwave Design Techniques	1	12	100%			

Enter the appropriate percent for each type of class for each course (e.g., 75% lecture, 25% recitation).

Table 3. Faculty Workload Summary
(Electrical & Computer Engineering)

Faculty Member (Name)	FT or PT	Classes Taught (Course No./Credit Hrs.) Term and Year[1]	Total Activity Distribution[2]		
			Teaching	Research	Other3
Dr. Chang		ECE 511 – Fall 2001	N/A	N/A	Chem. E. Professor
Dr. Jimmy Eggerton	Ft	ENGR 201, ECE 441 – Fall 2001	90%	--	10%
		ENGR 201, ECE 442 – Winter 2002			
		ENGR 201, ECE 443 – Spring 2002			
Dr. Terri Fiez	Ft	ECE 4/522 – Fall 2001	10%	40%	50%
Dr. Len Forbes	Ft	ENGR 203 – Fall 2001	50%	40%	10%
		ECE 322 Labs – Winter 2002			
		ECE 619 / ECE 323 Labs – Spring 2002			
Dr. Cetin Koc	Ft	ECE 375 – Fall 2001	50%	40%	10%
		ECE 575 - Winter 2002			
		ECE 4/578, ECE 679 – Spring 2002			
Dr. Wojtek Kolodziej	Ft	ECE 351, ECE 550 – Fall 2001	50%	40%	10%
		ECE 112 (w/ Traylor), ECE 352, ECE 560 – Winter 2002			
Dr. Ben Lee	Ft	ECE 4/599, ECE 507 – Fall 2001	50%	40%	10%
		ECE 4/565, ECE 570, ECE 507 – Winter 2002			
		ECE 375, ECE 507 – Spring 2002			

Table 3. Faculty Workload Summary (Cont'd)

(Electrical & Computer Engineering)

Faculty Member (Name)	FT or PT	Classes Taught (Course No./Credit Hrs.) Term and Year[1]	Total Activity Distribution[2]		
			Teaching	Research	Other3
Dr. Huaping Liu	Ft	ECE 669 – Fall 2001	50%	40%	10%
		ECE 4/564 – Winter 2002			
		ECE 663 – Spring 2002			
Dr. Shih-lien Lu	Pt	ECE 679 – Fall 2001	100%		* Intel Employee
Dr. Luca Luechese	Ft	ECE 679 – Spring 2002	50%	40%	10% (3/02 start)
Dr. Mario Magaña	Ft	ECE 4/561 – Fall 2001	50%	40%	10%
		ECE 4/562, ECE 661 – Winter 2002			
		ECE 4/563, ENGR 203 – Spring 2002			
Dr. Karti Mayaram	Ft	ECE 679 – Fall 2001	50%	40%	10%
		ECE 322, (Buyout) Winter 2002			
		ECE 679 (RF) – Spring 2002			
Dr. Un-Ku Moon	Ft	ECE 323, ECE 520 – Fall 2001	50%	40%	10%
		ECE 4/523 – Winter 2002			
		ECE 323 – Spring 2002			
Dr. Thomas Plant	Ft	ECE 4/582, (Buyout) – Fall 2001	50%	40%	10%
		ECE 4/583, ENGR 202(labs)–Spring 2002			

Table 3. Faculty Workload Summary (Cont'd)

(Electrical & Computer Engineering)

Faculty Member (Name)	FT or PT	Classes Taught (Course No./Credit Hrs.) Term and Year[1]	Total Activity Distribution[2]		
			Teaching	Research	Other3
Dr. Raghu Settaluri	Ft	ECE 390 – Fall 2001	50%	40%	10%
		ECE 4/585 – Winter 2002			
		ECE 593 – Spring 2002			
Dr. Molly Shor	Ft	Head Advisor - Research		50%	50%
Dr. Wen-Tsong Shiue	Ft	ECE 4/573 – Winter 2002	50%	40%	10%
		ECE 679 – Spring 2002			
Dr. S. Subramanian	Ft	ECE 317 – Fall 2001	50%	40%	10%
		ECE 4/518 – Winter 2002			
		ECE 4/518, ECE 513 – Spring 2002			
Dr. Gabor Temes	Ft	ECE 580 – Fall 2001	50%	40%	10%
		ECE 626 – Winter 2002			
		ECE 4/528, (Buy Out) – Spring 2002			
Dr. Alexandre Tenca	Ft	ECE 577 – Fall 2001	50%	40%	10%
		ECE 4/571 – Winter 2002			
		ECE 271/272 – Spring 2002			

Table 3. Faculty Workload Summary (Cont'd)

(Electrical & Computer Engineering)

Faculty Member (Name)	FT or PT	Classes Taught (Course No./Credit Hrs.) Term and Year[1]	Total Activity Distribution[2]		
			Teaching	Research	Other3
Mr. Roger Traylor	Ft	ECE 4/572 – Fall 2001	50%		50%
		ECE 112 – Winter 2002			
		ECE 4/574 – Spring 2002			
Dr.Annette von Jouanne	Ft	Buyout, Buyout – Winter 2000	50%	40%	10%
		ECE 4/533, ENGR 202 – Spring 2002			
Dr. John Wager	Ft	ECE 4/517 – Fall 2001	50%	40%	10%
		ECE 512, ENGR 202 – Winter 2002			
Dr. Alan Wallace	Ft	ECE 4/531, ECE 530 – Fall 2001	50%	40%	10% (sabbatical)
		Sabbatical – Winter 2002			
		ECE 331(Dr. Rudy Severns)–Spring 2002			
Dr. Andreas Weisshaar	Ft	ECE 391, ECE 590 – Winter 2002	50%	40%	10%
		ECE 4/584, ECE 591 – Spring 2002			
Mr. Otto Gygax	Pt	ECE 111 – Fall 2001	10%		* HP employee
Dr. David Hackleman	Pt	ECE 441, 442, 442 – Fall, Winter, Spring	40%		* HP employee

Table 4. Faculty Analysis
Electrical & Computer Engineering

Name	Rank	FT or PT	Highest Degree	Institution from which Highest Degree Earned & Year	Years of Experience			Professional Registration (Indicate State)	Level of Activity (high, med, low, none) in:		
					Govt./Industry Practice	Total Faculty	This Insti-		Professional Society	Research	Consulting/Summer Work in Industry
Eggerton, Jimmy	Inst	FT	Ph.D	Southern Methodist Universtiy - 1984	28	1	1		none	none	med
Fiez, Terri	Prof	FT	Ph.D	Oregon State Universtiy - 1990	3	11	2		high	high	low
Forbes, Len	Prof	FT	Ph.D	University of Illinois 1970	3	29	18		low	low	high
Koc, Cetin	Prof	FT	Ph.D	University of California - 1988	1	13	9		high	high	med
Kolodziej, Wojtek	Prof	FT	Ph.D	Oregon State University – 1980		27	23		low	med	high
Lee, Ben	Assoc	FT	Ph.D	Pennsylvania State University – 1991		15	10		med	med	low
Liu, Huaping	Asst	FT	Ph.D	New Jersey Institute of Technology - 1997	9	1	1****		low	med	med
Magana, Mario	Assoc	FT	Ph.D	Purdue University 1987	4	19	12		low	med	med
Mayaram, Karti	Assoc	FT	Ph.D	University of California – 1988	8	10	1		high	high	med
Moon, Un-Ku	Asst	FT	Ph.D	University of Illinois 1994	5	6	3		high	high	med
Plant, Tom	Assoc	FT	Ph.D	University of Illinois 1975	5	23	23		med	med	low

Instructions: Complete table for each member of the faculty of the program. Use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>. The level of activity should reflect an average over the current year (year prior to visit) plus the two previous years.

Table 4. Faculty Analysis

Electrical & Computer Engineering

Name	Rank	FT or	Highest Degree	Institution from which Highest Degree Earned & Year	Years of Experience			Professional Registration (Indicate State)	Level of Activity (high, med, low, none) in:		
					Govt./Industry Practice	Total Faculty	This Insti-		Professional Society	Research	Consulting/Summer Work in Industry
Settaluri, Raghu	Assoc	FT	Ph.D	Indian Institute of Technology – 1990	6	9	3		low	med	low
Shiue, Wen-Tsong	Asst	FT	Ph.D	Arizona State University - 1999	9	8	.25		med	med	med
Shor, Molly	Asst	PT	Ph.D	University of Illinois 1992		9	9		high	low	low
Subramanian, Mani	Assoc	FT	Ph.D	Tata University of Fundamental Research		23	8		low	med	med
Temes, Gabor	Prof	FT	Ph.D	University of Ottawa 1961	12	40	11		high	high	high
Tenca, Alexandre	Asst	FT	Ph.D	University of California – 1998	11	14	3		low	high	med
Traylor, Roger	Inst	FT	Masters	Oregon State University - 1991	13	5	5		none	low	med
von Jouanne, Annette	Assoc	FT	Ph.D	Texas A & M 1995		6	6	PE	high	high	med
Wager, John	Prof	FT	Ph.D	Colorado State University – 1981	4	18	17		high	high	low
Wallace, Alan	Prof	FT	Ph.D	University of Sheffield 1966	11	23	16	Ontario Canada United Kingdom	med	med	low
Weisshaar, Andreas	Assoc	FT	Ph.D	Oregon State University – 1991	5	9	9		med	high	low

Instructions: Complete table for each member of the faculty of the program. Use additional sheets if necessary. <u>Updated information is to be provided at the time of the visit</u>. The level of activity should reflect an average over the current year (year prior to visit) plus the two previous years

Table 5. Support Expenditures
Electrical and Computer Engineering

	1	2	3	4
Fiscal Year	**99-00**	**00-01**	**01-02**	**02-03**
Expenditure Category				
Operations (1) (not including staff)	147,931	188,439	230,000	
Travel (2)	19,243	15,034	2,865	
Equipment (3)				
(a) Institutional Funds	33,038	27,140	20,000	
(b) Grants and Gifts (4)	184,921	53,500	234,000	
Graduate Teaching Assistants	141,266	219,866	235,000	
Part-time Assistance (5) (other than teaching)	3,034	6,577	8,000	

Instructions:

Report data for the engineering unit(s) and for each engineering program being evaluated. Updated tables are to be provided at the time of the visit.

Column 1: Provide the statistics from the audited account for the fiscal year completed 2 years prior to the current fiscal year.

Column 2: Provide the statistics from the audited account for the fiscal year completed prior to your current fiscal year.

Column 3: This is your **current fiscal year** (when you will be preparing these statistics). Provide your preliminary estimate of annual expenditures, since your current fiscal year presumably is not over at this point.

Column 4: Provide the budgeted amounts for your next fiscal year to cover the fall term when the ABET team will arrive on campus.

Notes:

1. Categories of general operating expenses to be included here.
2. Institutionally sponsored, excluding special program grants.
3. Major equipment, excluding equipment primarily used for research. Note that the expenditures (a) and (b) under "Equipment" should total the expenditures for Equipment. If they don't, please explain.
4. Including special (not part of institution's annual appropriation) non-recurring equipment purchase programs.
5. Do not include graduate teaching and research assistant or permanent part-time personnel.

Appendix IB – ABET Forms

Appendix II - Institutional Profile

A. Background Information Relative to the Institution

1. General Information

a. Oregon State University
   Corvallis, OR 97331-4501
b. Paul G. Risser, President
c. Ronald L. Adams, Dean, College of Engineering

2. Type of Control

Oregon State University is a state-controlled university.

3. Regional or Institutional Accreditation

Oregon State University is accredited by the Northwest Association of Schools and Colleges, Commission on Colleges. The most recent accreditation was 2001. The NASC Commission of Colleges URL is http://www.cocnasc.org/.

4. Faculty and Students

The "OSU Fact Book" provides a comprehensive statistical summary for the institution. The 2001 edition is on the web at http://oregonstate.edu/dept/budgets/IR/FB01/01FBcontents.htm. It covers the 2000-2001 academic year. The 2002 edition should be available prior to the accreditation visit in fall 2002. Summary information for fall term 2001 can be found in Table II-1.

5. Mission

Preamble

Oregon State University is a comprehensive, public, research university and a member of the Oregon University System. It is the state's land-grant, sea-grant and space-grant institution, and has programs and faculty located in every county of the state. OSU views the state of Oregon as its campus, and works in partnership with Oregon community colleges and other OUS institutions to provide access to educational programs.

Mission

Oregon State University aspires to stimulate a lasting attitude of inquiry, openness and social responsibility. To meet these aspirations, we are committed to providing excellent academic programs, educational experiences and creative scholarship.

Goals

Three strategic goals guide Oregon State University in meeting its mission.

Statewide Campus

Oregon State University has a historic and unique role in Oregon. As a land-grant university, our heritage is articulated in the statement "the state of Oregon is the campus of Oregon State University." We emphasize the importance of extending the university into every community in Oregon. OSU will provide learning opportunities for Oregonians, and will create and apply knowledge that contributes to the prosperity of the state and its quality of life.

Compelling Learning Experience

Oregon State University is committed to creating an atmosphere of intellectual curiosity, academic freedom, diversity, and personal empowerment. This will enable everyone to learn with and from others. This compelling learning experience celebrates knowledge; encourages personal growth and awareness; acknowledges the benefits of diverse experiences, world views, learning styles, and values; and engenders personal and societal values that benefit the individual and society. OSU will develop curricula based on sound disciplinary knowledge and input from practitioners. Students will acquire skills and knowledge for a lifetime of learning, and will be involved in scholarly and creative pursuits.

Top-Tier University

Oregon State University aspires to be a top-tier university. It is a Carnegie Doctoral/Research-Extensive University, a sea-grant institution and space-grant program, in addition to being a land-grant institution. We will measure our success by: the caliber of entering students, the accomplishments of students and alumni, the quality of the faculty, the quality of instructional and research facilities, the effectiveness and productivity of engagement with businesses and constituents, and the support for research and scholarship.

6. Institutional Support Units

A college does not stand on its own. The College of Engineering is an integral part of Oregon State University and nearly every unit provides support at some level. Following are the more significant support units and a brief summary of their contributions:

Computing (see http://scf.orst.edu/ for details)

The Milne Computer Center operates a DEC Alpha 4100 computer/file server with four central processors and some 40 gigabytes of online email disk storage. There is another 230 gigabytes of NFS mounted storage for user files. Major packages supported are: FORTRAN, C, SAS, GAMS, SPSS, and Gauss. The system also provides access to e-mail, electronic mailing lists, and Internet services such as world-wide-web, file transfer, network chat, and Usenet (Internet news). Connectivity to this system (and the rest of the internet) is available in each dorm through the Residence Computer Network. There is a campus computer lab staffed by Information Services employees, which is available to all students. There is also a computer consulting telephone/email service available to all students, faculty and staff members who need computer help.

Career Services (see http://oregonstate.edu/career/ for details)

Career Services provides services for students and alumni. Individual career counseling, job search advising and mock interviews are offered. Seminars on resume preparation, interviewing techniques, job search strategies, and internships/co-ops are regularly scheduled. Information is provided on graduate and professional school opportunities.

Two professionals (including the Director) are liaisons to the College of Engineering. The liaison role includes classroom presentations and working with engineering student groups. The liaisons meet with engineering faculty and staff to ensure good communications. They work regularly with faculty for employer development. In addition to the two liaisons, there are three other professionals available to engineering students. The College of Engineering funds an engineering student who is supervised by staff in Career Services to provide additional liaison.

Career Services traditionally hosts over 400 employers with over half seeking engineering related majors for internship/co-op and full-time employment. For the 2001-2002 academic year, over 2200 on-campus interviews were scheduled. A student resume data base accessible to all participating employers is maintained. A web based system provides students with 24-hour access to interview and appointment schedules and to a listing of employment vacancies. Several career fairs are offered each year. During the 2001-2002 academic year, two were specifically designed for engineering employers and students. At the Fall Engineering Career Fair 990 students and 58 employers attended. For the spring fair, 830 students and 51 employers attended.

Housing and Dining Services (see http://housing.orst.edu/ for details)

The University Housing and Dining Services (UHDS) mission reflects support of many institutional/academic program areas including Engineering, Math, Sciences, Honors College, Wellness, Forestry, Agricultural Sciences, Natural Resource Sciences, International Education, and the First Year Experience Program. All of these programs offer connections between academic departments and residential students.

Specifically UHDS has initiated efforts/or is in planning stages with:

- Formulation of and staff/student staff support of the Engineering Computer Lab in Wilson Hall.
- Helping form connections between Faculty and Students in Engineering Courses.
- Supporting and scheduling In-Hall Tutors and special academic programs (Engineering Week, special study programs, etc.).
- Formulation of academic study groups and supplemental instruction (SI) sessions for students in engineering courses within Wilson Hall.
- The Wilson Residential Director has been supported in efforts to gain training and experience in academic advising for students in Engineering, Math and Sciences.
- Several of the Wilson Hall student staff have been selected based on their level of expertise and commitment to assisting students in Engineering, Math and Sciences.

Student staff participated in extensive training on academic success theory, learning theory, and appropriate academic intervention skills.

- The senior Resident Advisor in Wilson for 2001-02 is an Engineering Major

Library (http://osulibrary.orst.edu/)

The library facility is a newly remodeled building with state-of-the-art telecommunication infrastructure. Over 200 computers, most with Internet access, are distributed throughout the library for student and faculty use. A classroom, equipped with 40 computers and Robotel software, is the site of a variety of lectures, seminars, and classes offered by subject librarians for instruction and training on the use of library and web resources. The library is open Monday-Thursday, 7:30 a.m.-1:00 a.m.; Friday, 7:30 a.m.-10:00 a.m.; Saturday, 10:00 a.m.-10:00 p.m; Sunday, 10:00 a.m.-1:00 a.m. A librarian is on duty 10:00 a.m.-10:00 p.m. on weekdays, 10:00 p.m.-6:00 p.m. on Saturday and 10:00 p.m.-10:00 p.m. on Sunday.

There are three science subject specialists available to help engineering students, including the Engineering Librarian, the primary resource person. Seminars and lectures are part of the teaching responsibilities as well as creating web guides and engineering information tutorials. Engineering students and faculty may request help from any library assistant and librarian working at the reference desk on the 2nd floor. General reference, technical support, quick lookups, directional queries and verifications are handled at the reference desk by rotating subject specialist librarians, library paraprofessionals and student workers. Desk personnel are trained to refer questions to the appropriate subject specialist if the content of the question requires in-depth subject knowledge. Students may also submit questions to the Engineering Librarian by email and through a general web form. Special consultation and online searching are available for the engineering students by the Engineering Librarian. Augmenting the primary services mentioned above are an engineering information searching course, seminars in the library computer system usage, and developing OSU World Wide Web resources in engineering information.

The primary means of finding journal citations is accessing licensed article databases via the web and various print indexes. The University Libraries have licensed access to comprehensive databases such as, Compendex, Inspec and the Applied Science and Technology Abstracts. Also, included are various specialty databases such as: Environmental and Pollution Abstracts, National Technical Information Service and Patents indexes. Most of the databases are available by connecting to the campus proxy server from anywhere that there is a web connection. The Engineering Librarian is assigned to the College of Engineering to purchase materials within fund lines that correspond to the engineering department's undergraduate and graduate programs. These responsibilities include collection development in the field of engineering. This includes the acquisition of books, journals, and web resources through collaboration with the engineering faculty. In addition, the library has a comprehensive approval plan with a major academic bookseller that automatically supplies newly published monographs that fall within the approval plan's profiles. All engineering departments are covered on the plan. Purchasing arrangements have been established with IEE and IEEE to acquire monographs, conference proceedings and journals from these societies. In addition, the Library has established a standing order with a major vendor to acquire appropriate ANSI standards.

The long established liaison relationship between the Library and the College of Engineering provides a constant and consistent mechanism for assessing how well the library's collections, facilities and services meet the needs of the engineering program.

B. Background Information Relative to the Engineering Unit

1. Engineering Educational Unit

History

Engineering education began at Oregon Agricultural College in 1889 with the formation of the Mechanical Arts Department. The School of Engineering was formed in 1908 and was eventually renamed the College of Engineering. Oregon Agricultural College was renamed Oregon State College and then Oregon State University. Baccalaureate degrees in Civil Engineering, Electrical Engineering and Mechanical Engineering were offered before the end of the 19th century and were initially accredited in 1936. Today the College has about 110 faculty. More than 3,100 undergraduate students are enrolled in 15 baccalaureate degree programs. More than 500 graduate students are enrolled in masters and doctorate degree programs.

Organization

The College of Engineering is one of eleven colleges at OSU. The OSU organizational chart and a directory of current administrators are presented in Table II-2. Also provided is an expanded organizational chart for the College of Engineering leadership.

Engineering education and research is widely distributed at OSU. Because of our Land Grant, Sea Grant and Space Grant traditions, the institution has a long history of interdisciplinary education and research. Formal engineering degree programs are offered within four colleges at OSU. These include:

College of Agricultural Sciences

- Bioengineering Department (MS, PhD)

College of Engineering

- Civil, Construction and Environmental Engineering Department (BS, MS, PhD)
- Chemical Engineering Department (BS, MS, PhD)
- Computer Science Department (BS, MS, PhD)
- Electrical and Computer Engineering Department (BS, MS, PhD)
- Industrial and Manufacturing Engineering Department (BS, MS, PhD)
- Mechanical Engineering Department (BS, MS, PhD)
- Nuclear Engineering and Radiation Health Physics Department (BS, MS, PhD)

College of Forestry

- Forest Engineering Department (BS, MS, PhD)

College of Science

- Physics Department (BS)

Although it does not offer an engineering degree program, the Wood Science and Engineering Department in the College of Forestry is notable for its strong relationship in graduate programs and research with the Civil, Construction and Environmental Engineering Department.

Mission

The Oregon State University College of Engineering enables learning of engineering practice; discovers new knowledge of engineering science and technology; and engages the citizens of Oregon, the Northwest region, the nation, and the world in the responsible application of engineering knowledge.

Vision and Goals

Growth in demand for engineers and computer scientists is continuing to be driven by global technology-based industrial growth, aging infrastructure and an expanding need for new infrastructure, and environmental stresses imposed by population growth and expanding human activities. The environment for engineering practice is increasingly more dynamic, in part due to:

- Global accessibility to technology
- Global networks of collaborative technical experts
- Speed of innovation as a basis for competition
- Increased complexity of products and services
- Increased impact of technological developments on society and the environment

This dynamic environment is placing increasing demands on the education of new engineering graduates and necessitates life-long learning for practicing engineers.

We will adapt to meet the needs of this rapidly changing, global environment by:

- Evolving our curriculum to a form in which learning is motivated by interdisciplinary engineering practice that is woven into our traditional engineering science curriculum. Through this process, our graduates will gain both fundamental knowledge of engineering practice and the social and communication skills that will make them *among the best prepared for immediate engineering practice.*
- Initiating and growing collaborative, interdisciplinary research programs that are motivated by local, national and international needs for knowledge discovery. Simultaneously, our faculty will become international experts connected to a global collaborative network and *our research and graduate studies programs will be seen as national assets.*
- Creating an environment for learning and discovery that will be attractive to many of the best and brightest students. *The majority of Oregon's best high school graduates and outstanding students from the Northwest, across the nation, and around the world will select the College*.
- Initiating collaborative efforts that strengthen our engagement with local, national, and

international constituencies. *Locally, we will be a leader in the collaborative Oregon College of Engineering, comparable to other top institutions serving regional concentrations of advanced technology.*

As we succeed in meeting these challenges, we will support the University goals by:

- Creating a *compelling learning experience* for our students
- Helping *make Oregon the campus of Oregon State University*
- And the status of the College will be elevated to Top 25 colleges of engineering in the U.S. ("*Top Tier*"), by any measure

VISION AND GOALS

VISION PART I: Graduates are among the best prepared.

GOAL 1A: Improve program to achieve the following satisfaction index:

Postgraduate at greater than 95% satisfaction
Employers rating 4.5 on a 5.0

VISION PART II: Graduate study and research programs are national assets.

GOAL 2A: Grow research activity to achieve $18-20M by five years, adjusted by the national research funding level. Enable interdisciplinary research while strengthening core competence in focused areas of specialization.

GOAL 2B: Continuously identify, develop, and offer graduate programs that are relevant locally, regionally, and nationally, as measured by market feedback.

GOAL 2C: Increase the number of Ph.D. graduates placed in top-tier academic institutions.

VISION PART III: Attract many of the best and brightest students

GOAL 3A: Grow a diverse population of top group (high school GPA greater than 3.9 and SAT score greater than 1300) at a rate consistent with attracting the majority within 5 years.

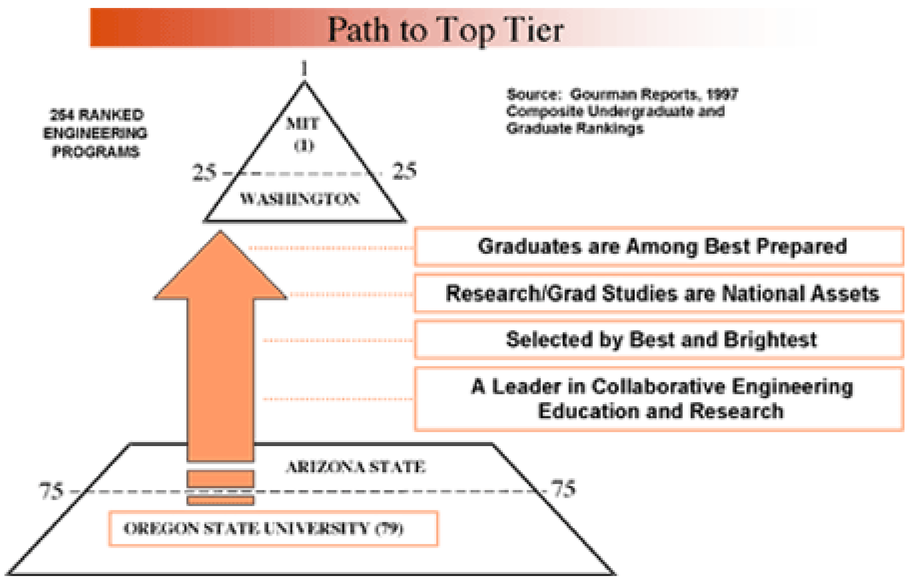
GOAL 3B: Increase the capacity of our professional degree program to serve all qualified students.

VISION PART IV: A leader in collaboration

GOAL 4A: Increase collaborative research and educational programs with other engineering programs to enable us to meet the needs of Oregon's businesses.

VISION PART V: A high-quality work environment.

GOAL 5A: Build an environment that will attract, develop, and retain world class faculty.



2. Programs Offered and Degrees Granted

The College of Engineering offers thirteen undergraduate degree programs. Undergraduate engineering programs are also offered by the College of Science (Engineering Physics) and the College of Forestry (Forest Engineering). All undergraduate programs lead to a Bachelor of Science degree. Programs offered by the Civil, Construction and Environmental Engineering Department and the Computer Science Department can also lead to the Bachelor of Arts degree. Students completing the Bachelor of Arts degree complete all requirements for the Bachelor of Science degree plus additional foreign language requirements. Table II-3 (part 1) lists the fifteen engineering baccalaureate degree programs offered at OSU.

Departments offering engineering baccalaureate degrees also offer advanced degrees for qualified students. In most departments the advanced degrees have the same name as the initial degree. In other cases, the graduate degree has a different name but is a continuation of the undergraduate degree. For example, completion of a Computer Engineering degree or an Electrical and Electronics Engineering degree would be appropriate preparation to pursue an M.S. and/or a Ph.D. degree in Electrical and Computer Engineering. Table II-3 (part 2) lists the undergraduate and graduate engineering programs offered at OSU.

Because of Oregon State's strong interdisciplinary emphasis, there are a number of "add-on" degree programs that engineering students may pursue. An example is the Honor's Baccalaureate degree. To receive the Honors Baccalaureate, students must complete their regular degree requirements, be admitted to the Honors College, maintain minimum academic standards, complete a specific number of Honors classes and successfully defend a senior thesis. An international degree is also available for students who, in addition to completing their discipline specific program, must demonstrate second language proficiency, complete an overseas exchange, complete additional global studies courses and defend a senior thesis related to international aspects of their discipline.

3. Information Regarding Administrators

Summary curriculum vitae for Engineering Dean's Office administrators follow:

ADAMS, Ronald L.

Dean, College of Engineering

Professor, Mechanical Engineering

DEGREES

B.S., Mechanical Engineering, Oregon State University, 1970

S.M., Aeronautics and Astronautics, Massachusetts Institute of Technology, 1971

Ph.D., Mechanical Engineering, Oregon State University, 1977

ACADEMIC POSITIONS

Instructor, Mechanical Engineering, Oregon State University, 1976-1977

Assistant Professor, Mechanical Engineering, Oregon State University, 1979-1983

Associate Professor, Mechanical Engineering, Oregon State University, 1983-1986

Dean of Engineering and Professor of Mechanical Engineering, 1998-present

NON-ACADEMIC POSITIONS

MIT, Aerophysics Laboratory, 1972

USAF Space and Missile Systems Organization, 1972-1975

MIT Lincoln Laboratory, 1977-1979

Tektronix, Inc., 6/84-8/98

Last Position: VP of Technology, Senior Fellow, Member, Corp. Tech. Mgmt. Council

PROFESSIONAL ACTIVITIES

Registration

State of Oregon, No. 11,614, Mechanical P.E.

Professional Societies

American Society of Mechanical Engineers: Treas., Willamette Valley Section, 1983-1984

Society for Imaging Science and Technology: Fellow, 2000-present

Committees, Commissions, and Boards

Member, Mechanical Engineering Industrial Advisory Board: 1992-1998

Member, ARPA MEMS Ind. Study Panel

Member, Corp Advisory Com., Society of Imaging Science and Technology: 1996-1998

Member, Oregon Medical Laser Laboratory Advisory Board

Member, Picojet Inc. Advisory Board

Member, Cascade Venture Partners Advisory Board

BELL, Chris A.

Associate Dean for Research and Graduate Studies, College of Engineering

Professor, Civil Engineering

DEGREES

B.Sc., Civil Engineering, University of Nottingham, England, 1972

Ph.D., Civil Engineering, University of Nottingham, England, 1978

ACADEMIC POSITIONS

Senior Research Assistant, Civil Engineering, Nottingham University, England, 1973-1977

Lecturer in Civil Engineering, Heriot-Watt University, Edinburgh, Scotland, 1977-1981

Assistant Professor, Associate Professor, Professor, Civil Engineering, Oregon State University, 1981-present

SERC Visiting Fellow, University of Nottingham, England, 1/15/88-8/15/88

Director of Transportation Research Institute, Oregon State University, 1990-1999

Associate Dean of Engineering, Oregon State University, 1997-present

FIELDS OF SPECIALIZATION

Commercial Vehicle Issues, Sustainable Transportation, Pavement Materials, Design, Evaluation & Modeling.

HONORS

Austin Paul Engineering Faculty Award for Excelling in Student-Teacher Relations, 1994

College of Engineering Alumni Achievement Award, 1995

PROFESSIONAL ACTIVITIES

Registration

Professional Engineer, State of Oregon (OR. 12,143)

Selected Committees

Transportation Research Board, A2B03 (1985-1995), A2D01 (1985-1996)

American Society of Civil Engineers, Student Services (1990-94); Scholarships, Grants & Bequests (1994-98)

Federal Highway Administration, Judge, Excellence in Highway Design Awards, 1998

State of Oregon, Governors Task Force on Road User Fees, 2001-2002

PETERSEN, Gary P.

Director, Engineering Cooperative Programs (MECOP, CECOP, GECOP)

Instructor

DEGREES

B.S., Industrial Arts Education, Oregon State University, 1975

MED, Industrial Education, Oregon State University, 1980

ACADEMIC POSITIONS

Instructor, Linn-Benton Community College, Manufacturing Processes, 1979-1981

Instructor, Oregon State University, 1981-present

Director, Engineering Cooperative Programs, Oregon State University, 1983-present

NON-ACADEMIC POSITIONS

Track and Field Coach, Philomath School District 17J, 1976-1979

Owner, Manager, and Principal Instructor of Martial Arts Academy, 1976-1988

Consultant to Portland Area Machining Center, 1989-1991

Consultant to Corvallis Area Software Company, 1996

FIELDS OF SPECIALIZATION

Cooperative Education, Industrial Material Processes, Tool Design, Engineering Graphics, Vocational certified for Construction, Machining, Architectural Design, Facilities Design.

PROFESSIONAL ACTIVITIES

Professional Societies

Society of Manufacturing Engineers, Epsilon Pi Tau, Negotiation Team (District 17J), National Education Association, Cooperative Education Association (CEA), Oregon Education Association

Committees, Commissions, and Boards

Member, Executive Board, Manufacturing Engineering Co-Op Program, 1986-present

Member, Search Committee for Career Planning and Placement Director, 1990

Committee Chair for Corporate Support - 1992 CEA National Convention, 1990-1991

Member, Executive Board, Advanced Mastery Co-Op Program (AMCOP), Albany Public School District 8J, 1991-1994

RATHJA, Roy C.

Assistant Dean for Academic and Student Affairs, College of Engineering

Associate Professor, Electrical and Computer Engineering

DEGREES

B.S.,	Physics, University of California at Davis, 1969
M.S., Ph.D.	Electrical Engineering, Oregon State University, 1973, 1980

ACADEMIC POSITIONS

Instructor, Oregon State University, 1975

Research Assistant Unclassified, Oregon State University, 1978-1980

Assistant Professor, Oregon State University, 1980-1985

Associate Professor, Oregon State University, 1985-present

Visiting Professor, Vrije Universiteit Brussel, Brussels, Belgium, 1986-87

Assistant Dean of Engineering, Oregon State University, 1990-present

NON-ACADEMIC POSITIONS

Naval Flight Officer, U.S. Navy, 1969-1972

Digital Systems Applications Consulting - various, 1973-present

FIELDS OF SPECIALIZATION

Computer Engineering systems design, digital signal processing, real-time systems

PROFESSIONAL ACTIVITIES

Professional Societies

American Society for Engineering Education

Institute of Electrical and Electronics Engineering

Professional Recognition

Sigma Xi, Phi Kappa Phi

Selected Committees

OSU Academic Advising Council, 1990-2001, chair, 1999-2000

OSU Bookstore Board of Directors, 1995-present, chair, 1998-9, 2002-present

OSU College of Engineering Curriculum Committee, Chair, 1990-present

OSU Scholarship Council, 2002-present, chair, 2002-present

Pacific Northwest Section ASEE Board of Directors, 1990-present, chair, 1996-7

REISTAD, Gordon M.

Associate Dean for Operations, College of Engineering

Professor of Mechanical Engineering

DEGREES

Ph.D., M.S., Mechanical Engineering, University of Wisconsin, 1970, 1967

B.S., Mechanical Engineering, Montana State University, 1966

ACADEMIC POSITIONS

Instructor, Mechanical Engineering, University of Wisconsin, 1969-1970

Assistant/Associate/ Professor, Mechanical Engineering, OSU, 1970-present

Department Head, Mechanical Engineering, Oregon State University, 1986-present

Associate Dean, Engineering, Oregon State University, 2001-present

NON-ACADEMIC POSITIONS

Consultant to EPRI, Battelle, NBS, ASHRAE, IDHA, and other firms in energy analysis

University of California, Lawrence Livermore Laboratory, Summer 1974

FIELDS OF SPECIALIZATION

Thermodynamic Analysis and Design of Systems; Energy Systems Analyst; Geothermal Energy Systems Analysis and Design; Heating, Refrigeration and Air Conditioning

PROFESSIONAL ACTIVITIES

Registration

Oregon 7833

Professional Societies

ASME: Fellow, ASHRAE: Fellow, ASEE: Member

Selected Professional Recognition

E.K. Campbell Award of Merit, ASHRAE, 1994, Boss of the Year Award, Oregon State University Office Personnel Association, 1994. ASHRAE Distinguished Service Award, 1991, Associate Editor, *ASME Journal of Engineering for Gas Turbines and Power*, 1999-present

Selected Committees, Commissions and Boards

Oregon Metals Initiative Board of Directors, 1990-present, ASME Advanced Energy Systems Division Executive Committee, 1994-, Evaluator of Mechanical Engineering Program for ABET, 1992-1998, ASHRAE Accreditation Activities Committee, Vice Chair, 1996-1998

SCHROEDER, W.L.

Associate Dean for Operations, College of Engineering

Professor Emeritus of Civil Engineering

DEGREES

B.S., Civil Engineering, Washington State University, 1962

M.S., Civil Engineering, Washington State University, 1963

Ph.D., Civil Engineering (Geotechnical Engineering), University of Colorado, 1967

ACADEMIC POSITIONS

Assistant Professor, 1967-1970; Associate Professor, 1970-1977; Professor, OSU, 1977-1998

Professor Emeritus, Civil Engineering, Oregon State University, 1998-present

Acting Head, Civil Engineering Department, Oregon State University, 1977-1978; 1988-1989

Associate Dean of Engineering, Oregon State University, 1974-1992; 2001-present

Vice President/Chief Business Officer, Finance and Administration, OSU, 1992-1997

Athletic Director (Interim), Oregon State University, 1997-1998

NON-ACADEMIC POSITIONS

Lieutenant, Corps of Engineers, United States Army, 1963-1965; Discharged, Captain, 1968

Staff Engineer, CH2M, Corvallis, OR, 1968-1971 (full and part-time)

Vice President, Andersen Construction, Portland, OR, 1998-2000

PROFESSIONAL ACTIVITIES

Registration

Registered Professional Engineer, Oregon, No. 6199, Washington, No. 15736

Professional Societies

American Society of Civil Engineers

Geotech Engineering Division Exec Committee, 1985-1995;(Chair, 1989-1990), National Committee on Session Programs (Chairman, 1980-1984), National Committee on Earth Retaining Structures (1975-1980), Oregon Section (President, 1979), Oregon State University Student Chapter Adviser (1967-1971)

Professional Recognition

Friel Award, Athlete with Highest Graduating GPA, WSU, 1961

Carter Award (Outstanding Teacher in School of Engineering, OSU, 1973-1974)

“Outstanding Civil Engineer”, Oregon Section ASCE, 1987

SHEA, John E.

Head Advisor

Assistant Professor of Industrial and Manufacturing Engineering

DEGREES

Ph.D., Industrial Engineering, Oregon State University, Corvallis, 1997

MBA, Business, Chaminade University, Honolulu, 1988

M.S., Electrical Engineering, The Ohio State University, Columbus, 1969

B.S., Electrical Engineering, The Ohio State University, Columbus, 1969

ACADEMIC POSITIONS

Head Advisor, Oregon State University, 2000-present

Assistant Professor, Oregon State University, 1998-present

Instructor, Oregon State University, 1994-1998

Assistant Professor, Chaminade University, Honolulu, HI, 1989-1991

NON-ACADEMIC POSITIONS

Quality Engineer, Intelect, Honolulu, HI, 1988-1989

Electrical Engineer, Hewlett-Packard, Corvallis, OR, 1977-1987

Electrical Engineer, Hewlett-Packard, Loveland, CO, 1973-1977

Electrical Engineer, Fairchild Semiconductor, Mt. View, CA, 1970-1972

FIELDS OF SPECIALIZATION

Engineering Curriculum Development, Quality Management

PROFESSIONAL ACTIVITIES

Professional Societies

American Society of Engineering Education

Professional Recognition

Tau Beta Pi

Eta Kappa Nu

4. Supporting Academic Departments

Most departments at OSU provide courses taken by engineering students. Table II-4 lists those departments that provide required courses with outcomes essential to one or more engineering programs. Other departments provide courses to meet the OSU general education (Baccalaureate Core) requirements or other elective options with outcomes that are not prerequisite to required courses in engineering programs.

5. Engineering Finances

See Table II-5.

6. Engineering Personnel and Policies

a. Personnel

See Table II-6

b. Faculty Salaries, Benefits, and Other Policies

Performance Reviews

Department heads conduct an annual performance review with each faculty member based upon the record of performance of the faculty member during the previous 12-month period. A comprehensive activity report, prepared for each faculty member, serves as a basis for this review. Both the faculty member and the department head analyze activities. At the time of the annual performance review, the faculty member and department head review the faculty member's performance in relation to accomplishment of the objectives established in the previous year, and establish the faculty member's objectives for the next year. The Dean of Engineering reviews every faculty member's report.

The Promotion and Tenure process begins in departments where the faculty member, advised by the department head, prepares a dossier covering accomplishments during service in the review period. This dossier is submitted to a departmental promotion and tenure committee. The committee solicits outside reviews from a list suggested by the candidate, and from other reviewers. Based on its evaluation of the dossier and reviewers' comments, the committee makes a recommendation to the department head. The department head conducts an independent evaluation, and makes a recommendation to the College of Engineering promotion and tenure committee. This committee makes its evaluation, after a presentation by the faculty member's department head, and votes on the proposal with the faculty member's department head abstaining. The committee makes its recommendation to the dean of engineering, who in turn, makes a recommendation to the Provost and Executive Vice President of the university. The Provost is assisted by a committee comprising the Vice Provost for Research, the Vice Provost for Academic Affairs, Dean of the Graduate School, and Dean/Director of Extended Education, and non-voting faculty observers.

After three years of service in the College of Engineering each newly appointed tenure-track faculty member has an extended review. The format followed *is exactly* the same as in the preparation of a dossier and review for promotion and tenure, *except* that external letters of evaluation are not requested and the process is completed at the Dean's level. The departmental committee, the department head, the College committee, and the Dean add letters evaluating the faculty member's performance to the dossier. A personal interview with the Dean concludes the process.

In 2001-02 a post tenure review process was developed to conduct reviews of all tenured Associate Professors and Professors. These reviews involve a faculty committee as well as the department head and are to occur every five years.

The College of Engineering conducts an extended review of Department Heads after *five* years service.

Salaries

See Table II-7 for salary data. The annual performance review provides a basis for the distribution of salary funds available for distribution for fully satisfactory and/or meritorious performance. Usually part of the salary distribution is across-the-board. The remaining portion will then be distributed on a merit basis by the dean of the college with recommendations from the department head. For example, if the total salary funds available provided for a 5% average increase, the across-the-board raise in recognition of inflation might be 2.5%. The dean, upon the recommendation of the department head, may then approve merit salary adjustments from zero to 10%. Salary increases above this level require approval by the provost. The above practice has been followed for many years and, in general, has provided for flexible administration of salary improvements in a way that recognizes merit.

Benefits

Fringe benefits include full payment of basic health and dental insurance premiums, a $5000 life insurance policy, and the employee’s part of the contribution to the retirement system. Under the Oregon Public Employees Retirement program, 6% of the employee’s salary is contributed to an annuity fund held in the employee’s name and 11% of salary is contributed to the general investment pool. University payment of the 6% of the employee’s annuity fund was adopted as a policy over ten years ago in lieu of a salary increase at that time.

A sabbatical leave program for faculty members with six years of full time service is supported and encouraged by the College of Engineering. During a sabbatical leave, 60% of the faculty member’s salary is paid from the university’s instruction budget. In addition to sabbatical leaves, the university permits leave without pay for faculty that wish to work in industry for a period of time. Faculty use this opportunity to work in areas enhancing their professional experience.

c. Faculty Workload

The College of Engineering has adopted a workload model for faculty. There is, however, some latitude allowed at the departmental level to accommodate the unique characteristics found in each program.

The model for nine-month, tenure-track, 1.0 FTE faculty will include 10 work units distributed among the following:

Teaching (T)

Service (S)

Research & Scholarly Activities (RSA)

Divided into Two Categories

- Department funded RSA (DFRSA)
- Externally funded RSA (EFRSA)

Each faculty member will be assigned at least 1 unit each of Teaching, Service, and Research and Scholarly Activities. The remaining 7 units will be allocated depending on goals for the year (including department needs) and past performance.

The following represent allocation of units:

TEACHING - (T):

- Each three-credit quarter course will equal a one-unit assignment. On the assumption that each four-credit course takes about 25% more effort than a three-credit course, each four-credit course carries a 1.25 unit assignment.
- Allowances (including partial unit assignments) may be made for course development, class size, availability of teaching assistants, the level of the class, whether a particular class is taught “on-campus” or “at a distance,” professional development activities aimed at improving teaching quality, such as participation in training or short courses, etc.

SERVICE - (S):

- One unit of service is allocated to all faculty to allow for departmental, college and university committees, professional society activity and routine advising and service.
- Additional service units may be allocated based on assignments for special initiatives, designated advising, serving as editor of a technical journal, serving as chair of a conference or workshop, serving in an executive capacity or on the board of directors of a professional society, special department or college marketing efforts, etc.

DEPARTMENT FUNDED RESEARCH & SCHOLARLY ACTIVITIES - (DFRSA)

- One unit of DFSRA is allocated to all faculty to allow for an initial level of scholarly activity, professional development activities aimed at enhancing research competitiveness and quality, and unfunded graduate student direction.
- Two additional units of DFSRA are allocated to faculty who are pursuing funded research and are having success at an externally funded research level of 1/3 of the average for the College.
- Faculty with less than three years of service may be allocated DFRSA through the fourth unit to accommodate research initiation. As possible, departments should

arrange for a fifth unit through start-up funds.

- For faculty with greater than three years of service the level of research activity for work unit assignment will be based on the two previous years.

EXTERNALLY FUNDED RESEARCH AND SCHOLARLY ACTIVITIES – (EFRSA)

- One unit of EFSRA is allocated to faculty who are pursuing funded research and are providing a total of 1.0 FTE of external GRA support (i.e., 2 GRAs at 0.5 FTE each, or 3 GRAs at 0.3 FTE each).
- One EFRSA unit is provided for faculty buying out at $1/7^{th}$ (0.143 FTE) of their academic year salary + OPE on external funds ($1/7^{th}$ academic year salary = one work unit). Note that this is $1/7^{th}$ because of the units of DFRSA that go toward the faculty member's research.
- For grants and contracts with agencies that do not allow academic year faculty support such as NSF, one EFRSA unit can be allocated for faculty who provide one additional 1.0 FTE of GRA support on external funds (1.0 FTE of GRA support = one work unit)

– SOME EXAMPLES OF WORK UNIT ALLOCATIONS FOR FACULTY –

FACULTY MEMBER	TEACHING (T)	SERVICE (S)	RESEARCH & SCHOLARLY ACTIVITIES		COMMENTS
			DFRSA**	EFRSA	
Z1	8	1	1		Faculty member with primary assignment in teaching and minimal research funding.
Z2	7	2	1		Faculty member with primary assignment in teaching, increased service and minimal research funding.
Z3	6	1	3		Faculty member with funding at about 1/3 COE average.
Z4	5	1	3	1	Faculty member with funding at a level to support GRAs at 1.0 FTE level.
Z5	4	1	4	1*	New faculty member initiating research.
Z6	4	1	3	2	Faculty member with support of 1.0 FTE of GRA and buyout of 1 work unit at 1/7.
Z7	3	1	3	3	Faculty member with support of 1.0 FTE of GRA and buyout of 2 work units at 1/7 each.
Z8	2	1	3	4	Faculty member with support of 1.0 FTE of GRA and buyout of 3 work units at 1/7 each.

* Start-up funds.

** DFRSA units 2, 3, 4 are available to be used as matching funds for research proposals.

d. Supervision of Part-time Faculty

The supervision of part-time faculty is similar to that for full-time faculty. Their direct supervisor is the department head who hired them. A local/regional search is required and a search committee consists of faculty from the department. After being hired, the department head may delegate some aspects of the particular course supervision to a full-time faculty member, but the ultimate responsibility for supervision is with the department head.

7. Engineering Enrollment and Degree Data

Undergraduate engineering enrollment, like institutional enrollment, has shown significant growth since the last general accreditation visit. Baccalaureate degrees have grown by more than 20%. The more telling growth has been in the 65% growth in freshman enrollments (students with less than 45 credits). The growth of new freshmen (Table II-9) is even higher. Preliminary data for fall term 2002 indicates another significant increase in new freshmen. The growth in new students will result in a significant increase in total students and degree production for at least the next five years. Graduate enrollment has been generally stable over this period although growth occurred for the 2001-2002 academic year possibly indicating a future trend. Enrollment details are in Table II-8.

8. Definition of Credit Unit

The academic year is based on three quarters – fall, winter and spring. There is a summer session, but it is not part of the normal academic year. Each quarter is 10 weeks of instruction followed by a week for final exams. Therefore, one academic year represents 30 weeks of classes, exclusive of final exams. One credit hour represents one class hour or two to three laboratory contact hours per week.

9. Admission and Graduation Requirements, Basic Programs

A. Admission of Students

1. Students admitted to Oregon State University may select any program in engineering without restriction. The basic admission criterion is a 3.0 high school GPA and completion of specific college preparation subjects. Applicants with high school GPA between 2.75 and 3.00 are admitted based on their SAT composite score. Students who are not admissible may petition a university committee for admission. Specific admission standards can be found on the web at:

   http://oregonstate.edu/admissions/Level2/freshman.html

2. Table II-9 provides historical information about new freshmen admitted for fall term. Nearly all new freshmen begin in the fall so data for winter and spring is not included.

3. The OSU Office of Admissions maintains articulation tables for transfer courses. Courses equivalent to OSU offerings are articulated as the OSU equivalent after

evaluation by the appropriate OSU department. Non-equivalent courses are articulated as lower division transfer (LDT) or upper division transfer (UDT) and assigned an appropriate number of credits.

Individual programs may determine how to use LDT and UDT articulated courses for a specific student's degree program. Since transfer articulation requires specialized knowledge and is important to maintain program quality, satisfaction of degree requirements by LDT or UDT articulation is done within the College of Engineering by the departmental head advisor or by the college head advisor. For math and science courses, a recommendation from the OSU department offering similar courses is frequently requested.

Example articulation tables can be found for Oregon institutions at:

http://oregonstate.edu/dept/admindb/OregonTransferCredit-OregonCollegesandUniversities/scr1160_arttab.htm

Credit may also be received for Advanced Placement, International Baccalaureate or CLEP. The policy for such credit can be found at:

http://oregonstate.edu/dept/academic/aa/advsgman/advpla.htm

4. To apply to the Professional Program (junior and senior years) students must complete a specific set of courses, normally taken during the first two years, with C- or better grades. Required courses are listed in the General Catalog and in departmental advising guides. In addition, their cumulative GPA for these courses must be at least 2.25. Each program has a maximum number of students that may be admitted each year based on the program's ability to provide a quality education. In the event that more students apply than the maximum allowed, the students with the highest GPA in required courses are admitted. Detailed information about the admission process may be found at:

   http://www.engr.orst.edu/students/advising/policy.html

5. Any transfer student admitted to OSU can select any engineering program without restriction. The general transfer requirements include completion of at least 36 credits including a college level writing and math course with a GPA of 2.25 or better. Detailed requirements can be found at:

   http://oregonstate.edu/admissions/Level2/transfer.html

   There are no general articulation agreements for engineering programs. At the institution level, there is an agreement involving transfer students completing the Associate of Arts Oregon Transfer degree. Upon matriculation such students are considered to have completed the lower division requirement for the university general education (Baccalaureate Core) requirement. This agreement does not allow such students a waiver for specifically required program courses like public speaking and technical report writing required for all engineering majors.

For admission to the Professional Program in engineering, transfer students meet the same requirements and admission process as OSU students discussed in 9.A.4. College policy requires that students repeat courses in which they receive a grade of C- or lower. This policy applies to courses taken at the institution or transferred from another institution.

6. Transfer students have always comprised a significant portion of the students at OSU. Approximately 10 Oregon Community Colleges and several four-year institutions offer Pre-Engineering programs with most lower division courses required for engineering majors. Table II-10 summarizes transfer statistics.

B. Requirements for Graduation

1. In engineering, primary responsibility for verifying completion of graduation requirements lies with the program. The university verifies that students meet minimum requirements in total credits, upper division credits and residency. The college verifies that students meet minimum GPA requirements. All other requirements are verified by the program.

2. All baccalaureate degree programs are offered by traditional on-campus instruction.

3. To gain admission to the Professional Program (junior year), students must achieve a minimum of 2.25 in a set of required lower division courses. The required courses are indicated in the OSU General Catalog. To receive an undergraduate degree, students must gain admission to the Professional Program and then achieve a GPA of 2.25 in required upper division technical courses (university general education and free electives are not included). Details of the College of Engineering academic policy is available on the web at:

http://www.engr.orst.edu/students/advising/policy.html

10. Non-academic Support Units

The College of Engineering maintains a full-time staff of five to provide centralized computer support services. This group specifies and supports the general hardware, software, and network infrastructure to augment specialized departmental resources. They provide basic accounts and file storage for all faculty, staff and students in the College. They also support instructional lab space, email lists and web space to support Engineering courses and they provide support for the College and Electrical and Computer Engineering Department administrative offices

There are eight College supported computer labs open to all Engineering students. The breakdown is as follows: Apperson 312 (22 PC's); Graf 202 (30 PC's); Dearborn 115 (25 HP-UX workstations); Dearborn 119 (26 PC's); Rogers 338 (23 HP-UX workstations): Owen 241

(16 HP-UX workstations); Radiation Center B-130 (6 PC's and 6 HP-UX workstations); Wilson Hall Dormitory (6 PC's).

The College of Engineering computer support group provides coordination with departmental computing support staff as well as with the University's Information Systems group. Some of the software supported includes: basic Unix and Microsoft tools, Outlook, Microsoft Office, Star Office, ProE, Ansys, Matlab, Mathematica, Pspice, SNAP, Maple 7, Avant!, Absoft Pro, Fortran 7.5, Arcview GIS, AutoCAD 2000, Precision Collection, Primavera, SAP 2000, Crystal Reports, WP Bridge Designer, ActiveState PERL, Banner, GQL, Print Screen deluxe, Adobe Acrobat, Norton Antivirus, Pagemaker, Photoshop, Dreamweaver, Filemaker, Quick Books and Quest.

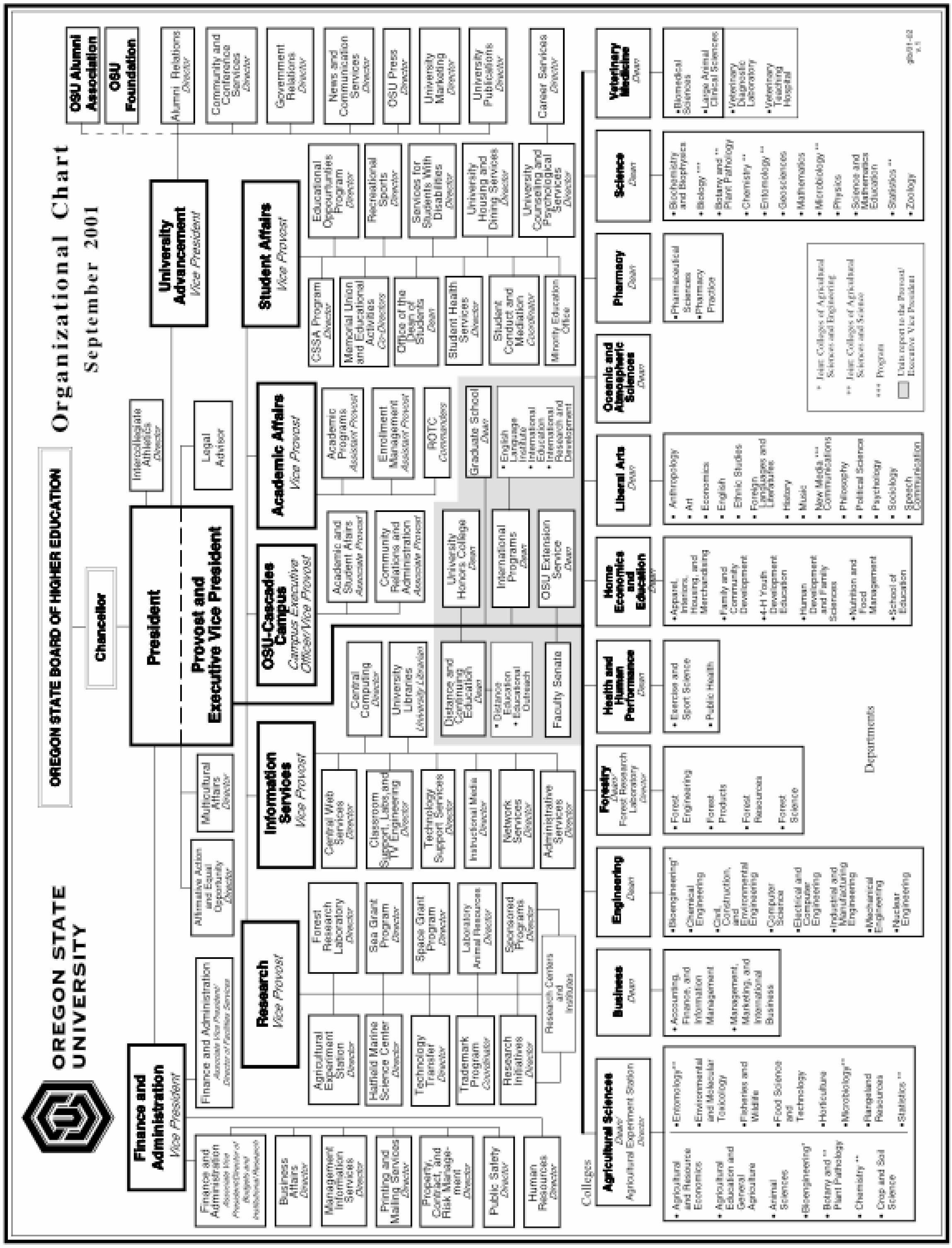
Appendix II

C. Tabular Data for Engineering Unit

Table II-1. Faculty and Student Count for Institution
School Year: 2001-2002

	HEAD COUNT		FTE	TOTAL STUDENT CREDIT HOURS
	FT	PT		
Tenure Track Faculty	1043	11	1023.7	
Other Teaching Faculty (excluding student assistants)	1858	138	1782.7	
Student Teaching Assistants		511	213	
Undergraduate Students	13417	1460	13963.7	209455
Graduate Students	1993	875	2785.3	29842
Professional Degree Students	262	27	355.6	4267

Table II-2a OSU Organizational Chart



Oregon State University

ORGANIZATIONAL CHART DIRECTORY

September 2001

Division-Unit/Position-Title	*Name*	Tel.#
President	***Paul G. Risser***	4133
Legal Advisor	*Caroline Kerl*	2474
Director, Affirmative Action and Equal Opportunity	*Angelo Gomez*	3556
Director, Intercollegiate Athletics	*Mitch Barnhart*	2547
Director, Multicultural Affairs	*Phyllis S. Lee*	4381
Provost and Executive Vice President	***Timothy P. White***	2111
Dean, Distance and Continuing Education	*William T. McCaughan*	8747
Dean, OSU Extension Service	*Lyla E. Houglum*	2711
Dean (I), Graduate School	*Sally K. Francis*	4881
Dean, International Programs	*John G. Van de Water*	3006
Dean, University Honors College	*Joe Hendricks*	6400
Associate Dean/Executive Director, Distance Education	*Mark L. Merickel*	3810
Executive Director, Educational Outreach	*Barbara J. Moon*	1282
Director, English Language Institute	*Deborah Healey*	2464
Director, International Education	*Christine Sproul*	3006
Director, International Research and Development	*Larry J. Kenneke*	6407
President, Faculty Senate	*Nancy Rosenberger*	4344
Finance and Administration Vice President	*Mark McCambridge*	1182
Associate VP/Dir. Budgets and Institutional Research		
Associate VP/Dir. Facilities Services	*Robert J. Lloyd*	7705
Director, Business Affairs	*Beth H. Barker*	0626
Director, Human Resources	*Jacquelyn Rudolph*	0551
Director, Management Information Services	*Sandie Franklin*	322-3108
Director (I), Printing and Mailing Services	*Michael Hart*	4070
Director, Property, Contract, and Risk Management	*Brian K. Thorsness*	7344
Director, Public Safety	*Jack Rogers*	3010
University Advancement Vice President	***Orcilia Forbes***	4875

Director, Alumni Relations	*Dwayne Foley*	7857
Director, Community and Conference Services	*Melanie Fahrenbruch*	6442
Director, Government Relations	*Jock Mills*	0725
Director, News and Communication Services	*Mark M. Floyd*	4611
Director, OSU Press	*Jeffrey B. Grass*	3166
Director, University Marketing	*Jill R. Schuster*	4668
Director, University Publications	*Tina B. Chovanec*	3166
Research Vice Provost (I)	***Rich Holdren***	3467
Director, Agricultural Experiment Station	*Thayne R. Dutson*	4251
Director, Forest Research Laboratory	*Harold J. Salwasser*	1585
Director, Hatfield Marine Science Center	*Lavern J. Weber*	0211
Director, Laboratory Animal Resources	*Alexander D. Ojerio*	2263
Director, Research Initiatives 0663	*Vacant*	
Director, Sea Grant Program	*Robert E. Malouf*	3396
Director, Space Grant Program	*Andrew C. Klein*	2414
Director, Sponsored Programs	*Peggy S. Lowry*	0670
Director, Technology Transfer	*William W. Hostetler*	3439
Faculty Liaison	*Jack Higginbotham*	9088
Coordinator, Trademark Licensing	*Candy C. Hayes*	0672
Centers and Institutes (Directors)		
Center for Advanced Materials Research	*Arthur W. Sleight*	6749
Center for Fish Disease Research	*Michael L. Kent*	4753
Center for Gene Research and Biotechnology	*James C. Carrington*	3347
Center for the Humanities	*Vacant*	2450
Center for the Study of First Americans	*Bob Bonnichsen*	4595
Center for Water and Environmental Sustainability	*Ken. Williamson and Denise Lach*	4022
Cooperative Institute for Marine Resources Studies	*Clare E. Reimers*	0220
Environmental Health Sciences Center	*Dale W. Mosbaugh*	3608
Linus Pauling Institute	*Balz B. Frei*	5078
Marine/Freshwater Biomedical Sciences Research Center	*George S. Bailey*	2162

Nuclear Science and Engineering Institute	*Stephen E. Binney*	2344
Radiation Center	*Stephen E. Binney*	2344
Survey Research Center	*Virginia M. Lesser*	3366
Transportation Research Institute	*Soloman C-S Yim*	4273
Student Affairs Vice Provost	***Larry D. Roper***	3626
Dean of Students, Office of the Dean of Students	*Richard H. Shintaku*	8748
Director, Career Services	*Thomas G. Munnerlyn*	4085
Director, College Student Services Admin. Program	*J. Roger Penn*	3655
Director, Educational Opportunities Programs	*Lawrence F. Griggs*	3924
Co-Directors, Memorial Union and Educational Activities	*Cheryl Anderson*	2101
	Michael Henthorne	2416
	Frank A. Ragulsky	3374
Director, Recreational Sports	*Thomas G. Kirch*	3736
Director, Services for Students with Disabilities	*Tracy Bentley-Townlin*	3669
Director, Student Health Services	*Lora L. Jasman*	3106
Director, Counseling and Psychological Services	*Rebecca A. Sanderson*	2131
Director, University Housing and Dining Services	*Thomas D. Scheuermann*	4771
Coordinator, Student Conduct and Mediation	*William N. Oye*	3658
Minority Education Office		9030
Academic Affairs Vice Provost	***Sabah U. Randhawa***	0732
Assistant Provost, Academic Affairs	*Robert M. Burton*	8009
Assistant Provost, Enrollment Management	*Robert M. Bontrager*	4088
Commander, Air Force ROTC	*Mark S. Overholtzer*	6283
Commander, Army ROTC	*Daniel P. Schwab*	3511
Commander, Naval ROTC	*James A. Haggart*	6239
Information Services Vice Provost	***Curt Pederson***	0739
University Librarian/Deputy Vice Provost for Information Services, University Libraries	*Karlye S. Butcher*	7300
Director, Central Computing	*Philip H. Isensee*	3325
Director, Central Web Services	*Robert S. Baker*	4007
Director, Classroom Support, Student Computing Facilities, and TV Engineering	*Rick Brand*	3816

Director, Instructional Media	*Larry L. Pribyl*	3817
Director, IS Administrative Services	*James S. Corbett*	2526
Director, Network Services	*Shay Dakan*	3-3500
Director, Technology Support Services	*Tammy L. Barr*	5404
OSU-Cascades Campus		
Campus Executive Officer/Vice Provost	*Roy G. Arnold*	322-3107
Associate Provost, Academic and Student Affairs	*Henry M. Sayre*	322-3103
Associate Provost, Community Relations and Administration	*Linda S. Johnson*	322-3102
Agricultural Sciences, Dean and Director, Agricultural Experiment Station	***Thayne R. Dutson***	2331
Head, Agricultural and Resource Economics	*William G. Boggess*	1395
Head, Agricultural Education and General Agriculture	*R. Lee Cole*	2661
Head, Animal Sciences	*James R. Males*	3431
Head, Bioresource Engineering	*James A. Moore*	2041
Chair, Botany and Plant Pathology	*Stella M. Coakley*	5264
Chair, Chemistry	*John C. Westall*	6700
Head, Crop and Soil Science	*Russell S. Karow*	2821
Chair, Entomology	*Timothy D. Schowalter*	4733
Head, Environmental and Molecular Toxicology	*Larry R. Curtis*	1789
Head, Fisheries and Wildlife	*W. Daniel Edge*	4531
Head, Food Science and Technology	*Robert J. McGorrin*	6488
Head, Horticulture	*Charles D. Boyer*	3695
Chair, Microbiology	*Vacant*	1834
Head, Rangeland Resources	*William C. Krueger*	1615
Chair, Statistics	*Robert T. Smythe*	3366
Business, Dean (I)	***Sabah U. Randhawa***	6024
Chair, Accounting, Finance, and Information Management	*Ilene K. Kleinsorge*	6030
Chair, Management, Marketing, and International Business	*Erik W. Larson*	4276
Engineering, Dean	***Ronald L. Adams***	3101
Head, Bioresource Engineering	*James A. Moore*	2041

Head, Chemical Engineering	*Carol M. McConica*	4791
Head, Civil, Construction, and Environmental Engineering	*Kenneth J. Williamson*	6150
Head, Computer Science	*Michael J. Quinn*	3273
Head, Electrical and Computer Engineering	*Terri S. Fiez*	3118
Head, Industrial and Manufacturing Engineering	*Richard Billo*	2365
Head, Mechanical Engineering	*Gordon M. Reistad*	3441
Head, Nuclear Engineering	*Andrew C. Klein*	2343
Forestry, Dean and Director, Forest Research Lab	***Hal J. Salwasser***	1585
Head, Forest Engineering	*Steven D. Tesch*	4952
Head, Forest Products	*Thomas E. McLain*	4257
Head, Forest Resources	*John D. Walstad*	3607
Head, Forest Science	*W. Thomas Adams*	6583
Health and Human Performance, Dean (I)	***Jeffrey A. McCubbin***	3256
Chair, Exercise and Sport Science	*Anthony R. Wilcox*	2643
Chair, Public Health	*Anna K. Harding*	3824
Home Economics and Education, Dean (I)	***Clara C. Pratt***	3551
Chair (I), Apparel, Interiors, Housing, and Merchandising	*Cheryl W. Jordon*	0987
Chair (I), Family and Community Development	*David A. Philbrick*	1021
Chair, 4-H Youth Development Education	*James A. Rutledge*	1737
Chair, Human Development and Family Sciences	*Alan C. Acock*	1077
Chair, Nutrition and Food Management	*Melinda M. Manore*	3561
Director, School of Education	*Wayne W. Haverson*	5959
Liberal Arts, Dean	***Kay F. Schaffer***	4581
Chair, Anthropology	*John A. Young*	4515
Chair, Art	*James A. Folts*	4745
Chair (A), Economics	*B. Starr McMullen*	2321
Chair, English	*Robert B. Schwartz*	3244
Chair, Ethnic Studies	*Erlinda V. Gonzales-Berry*	0709
Chair, Foreign Languages and Literatures	*Joseph T. Krause*	2146
Chair, History	*Paul L. Farber*	3421
Chair, Music	*Marlan G. Carlson*	4061
Chair, Philosophy	*Peter C. List*	2955

Chair, Political Science	*James C. Foster*	2811
Chair, Psychology	*John S. Gillis*	2311
Chair, Sociology	*Gary H. Tiedeman*	2641
Chair, Speech Communication	*Gregg B. Walker*	2461
Director, New Media Communications	*Joel Thierstein*	9237
Oceanic and Atmospheric Sciences, Dean	***Mark R. Abbott***	3504
Pharmacy, Dean	***Wayne A. Kradjan***	5785
Chair, Pharmaceutical Sciences	*Gary E. Delander*	5805
Chair (I), Pharmacy Practice	*Theresa Bianco*	5791
Science, Dean	***Sherman H. Bloomer***	4811
Chair, Biochemistry and Biophysics	*Christopher K. Mathews*	1865
Chair, Biology	*Michael C. Mix*	1743
Chair, Botany and Plant Pathology	*Stella M. Coakley*	5264
Chair, Chemistry	*John C. Westall*	6700
Chair, Entomology	*Timothy D. Showalter*	4733
Chair (A), Geosciences	*Gordon E. Matzke*	1201
Chair, Mathematics	*Hal R. Parks*	4686
Chair, Microbiology	*Vacant*	1834
Chair, Physics	*Henri J. F. Jansen*	4569
Chair, Science and Mathematics Education	*Larry G. Enochs*	4031
Chair, Statistics	*Robert T. Smythe*	3366
Chair, Zoology	*Stevan J. Arnold*	5337
Veterinary Medicine, Dean	***Howard B. Gelberg***	2098
Head, Biomedical Sciences	*Michael Taylor*	6532
Head, Large Animal Clinical Sciences	*Thomas W. Riebold*	2858
Director, Veterinary Diagnostic Laboratory	*Jerry R. Heidel*	6964
Director (I), Veterinary Teaching Hospital	*Russell O. Crisman*	2858

Telephone: Off-Campus (541) 737-XXXX; On-Campus 737-XXXX or 713-XXXX

COLLEGE OF ENGINEERING LEADERSHIP

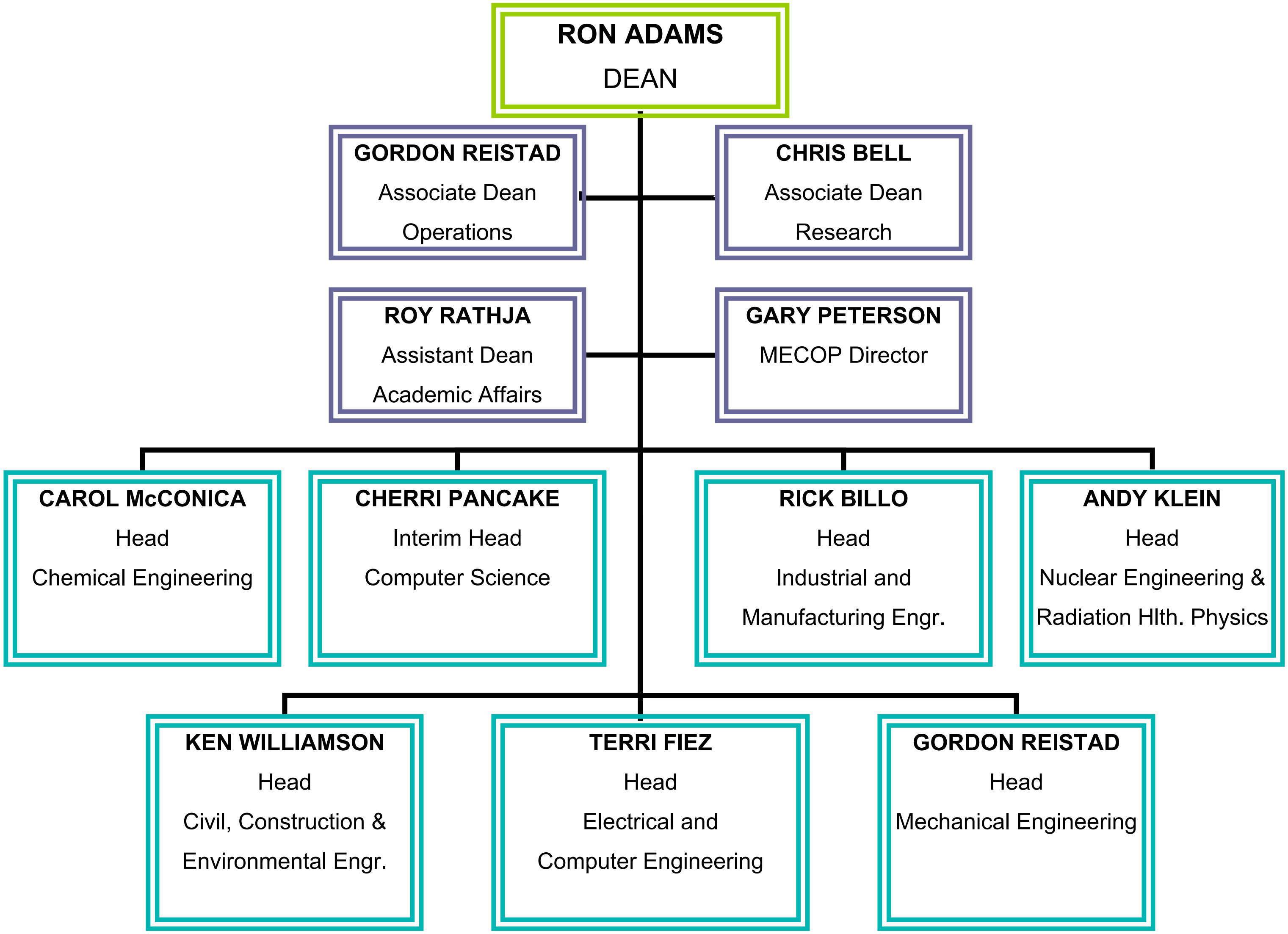


Table II-3 (Part 1). Baccalaureate Engineering Degrees Offered

Program Title	Modes Offered				Nominal Years to Complete	Administrative Head	Administrative Unit or Units (e.g. Dept.) Exercising Budgetary Control[1]	Submitted for Evaluation		Offered, Not Submitted for Evaluation	
	Day	Co-op	Off Campus	Alternative Mode				Now Accred.	Not Now Accred.	Now Accred.	Not Now Accred.
Bioengineering[2]	X				4	Carol McConica	ChE				X
Chemical Engineering	X				4	Carol McConica	ChE	X			
Civil Engineering	X				4	Ken Williamson	CCEE	X			
Computer Engineering	X				4	Terri Fiez	ECE	X			
Computer Science	X				4	Mike Quinn	CS		X		
Construction Engr Management[3]	X				4	Ken Williamson	CCEE				X
Electrical and Electronics Engr	X				4	Terri Fiez	ECE	X			
Engineering Physics	X				4	Henri Jansen	Physics				X
Environmental Engineering	X				4	Ken Williamson	CCEE	X			
Forest Engineering	X				4	Steve Tesch	FE		X		
Industrial Engineering[4]	X				4	Rick Billo	IME	X			
Manufacturing Engineering[5]	X				4	Rick Billo	IME	X			
Mechanical Engineering	X				4	Gordon Reistad	ME	X			
Nuclear Engineering	X				4	Andy Klein	NERHP	X			
Radiation Health Physics	X				4	Andy Klein	NERHP		X		

Table II-3 (Part 2). Degrees Awarded and Transcript Designations

Program Title and Designation on Transcript	Modes Offered: Day	Co-op	Off Campus	Alternative Mode	Name of Degree Awarded[6]
Bioengineering	X				BS
Bioresource Engineering	X				MS, PhD
Chemical Engineering	X				BS, MS, PhD
Civil Engineering	X				BA, BS, MS, PhD
Civil Engineering-Forest Engineering[7]	X				BS
Computer Engineering	X				BS
Computer Science	X				BA, BS, MA, MAIS, MS, PhD
Construction Engr. Management	X				BA, BS
Electrical and Electronics Engineering	X				BS
Electrical and Computer Engineering	X		X	X	MS, PhD
Engineering Physics	X				BS
Environmental Engineering	X				BA, BS
Forest Engineering	X				BS, MF, MS, PhD
Industrial Engineering	X				BS, MS, PhD
Manufacturing Engineering	X				BS
Manufacturing Engineering[8]			X	X	MME
Materials Science	X				MS
Mechanical Engineering	X				BS, MS, PhD
Nuclear Engineering	X				BS, MS, PhD
Ocean Engineering	X				MOcE
Radiation Health Physics	X				BS, MS, PhD
Software Engineering[9]			X	X	MSE

Notes for Table II-3

1. Departmental name abbreviations:

CCEE	Civil, Construction and Environmental Engineering
CS	Computer Science
ECE	Electrical and Computer Engineering
FE	Forest Engineering
IME	Industrial and Manufacturing Engineering
ME	Mechanical Engineering
NERHP	Nuclear Engineering and Radiation Health Physics

2. The Biological Engineering degree was renamed Bioengineering during the 2001-2002 academic year.
3. The Construction Engineering Management degree program is accredited by the American Council for Construction Education.
4. The Industrial Engineering option in Industrial and Manufacturing Engineering degree was renamed to Industrial Engineering in May 2002.
5. The Manufacturing Engineering option in Industrial and Manufacturing Engineering was renamed to Manufacturing Engineering in May 2002.
6. Degree name abbreviations:

BA	Bachelor of Arts
BS	Bachelor of Science
MAIS	Master of Arts in Interdisciplinary Studies
MF	Master of Forestry
MME	Master of Manufacturing Engineering
MOcE	Master of Ocean Engineering
MS	Master of Science
MSE	Master of Software Engineering
PhD	Doctor of Philosophy

7. The Forest Engineering-Civil Engineering program is a five-year program that meets the requirements of both the Civil Engineering degree and the Forest Engineering degree.
8. The Masters of Manufacturing is a joint program offered by Oregon State University and Portland State University. Courses are jointly offered via satellite to both campuses.
9. The Masters of Software Engineering is a joint program between Oregon State University, the University of Oregon, Portland State University and the Oregon Graduate Center and is delivered to all campuses via satellite.

Table II-4. Supporting Academic Departments
For Academic Year: 2001-2002

Department or Unit	Full-time Faculty Head Count	Part-time Faculty Head Count	FTE Faculty	Teaching Assistants	
				Head Count	FTE
Biology[1]	0	1	0.7	0	0
Chemistry	23	7	25.3	43	15.5
Crop & Soil Science	30	4	6.65	8	2
Economics	12	1	12.5	16	13.3
English	35	7	38.67	17	11.3
Forest Resources	20	3	20.8	18	4.5
Forest Science	16	1	16.5	1	0.25
Geosciences	17	4	19	29	6.1
Mathematics	23	15	32	46	30
Microbiology	15	0	18	9	9
Physics	17	0	17	20	19.5
Speech Communications	10	5	13	14	7
Statistics	13	3	13.75	22	8.5
Wood Science & Engineering	15	0	15	0	0

Notes:

1. The biology program depends on faculty from other biological sciences departments for delivery of courses.

Table II-5. Support Expenditures

College of Engineering

Fiscal Year	1 (prior to previous year)	2 (previous year)	3 (current year)[1]	4 (year of visit)
Expenditure Category				
Operations (not including staff)	$303,659[2]	$212,180[3]	$360,807[4]	
Travel	$9,424	$23,106	$15,881	
Equipment				
Institutional Funds	$1,568	$81,577	$86,780	
Other State Funds (ETIC)	$73,749	$22,857	$349,104	
Grants and Gifts	$108,606	$5,487	$1,137,140[5]	
Graduate Teaching Assistants	0	0	0	
Part-time Assistance (other than teaching)	0	0	$14,939	

Notes:

1. This column contains year-to-date (May 1) and encumbered
2. Includes $48,784 for minor equipment
3. Includes $40,504 for minor equipment
4. Includes $60, 012 for minor equipment
5. Includes $1,047,312 equipment grant from Hewlett-Packard

Table II-6a. Personnel and Students

College of Engineering

Year: 2001-2002

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative	8.5	0	8.5	
Faculty (tenure-track)	100	2	101	
Other Faculty (excluding student Assistants) Instructors	7	16	13.71	
Student Teaching Assistants	21	56	51.66	0.45
Student Research Assistants	49	43	69.93	0.61
Technicians/Specialists	19	0	19	0.17
Office/Clerical Employees	143.2	9	148.74	1.30
Others (research assoc/asst)	19	8	22.97	0.20

Undergraduate Student Enrollment[1,2]	2721	185	2845	24.80
Graduate Student Enrollment[1,3]	437	76	414	3.61

Table II-6b. Personnel and Students

College of Engineering Administration

Year: 2001-2002

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative	5	0	5	
Faculty (tenure-track)	0	0	0	
Other Faculty (excluding student Assistants)	0	0	0	
Student Teaching Assistants	0	0	0	N/A
Student Research Assistants	0	0	0	N/A
Technicians/Specialists	5	0	5	N/A
Office/Clerical Employees	12	1	12.5	N/A
Others	0	0	0	N/A

Undergraduate Student Enrollment	N/A	N/A	N/A	N/A
Graduate Student Enrollment	N/A	N/A	N/A	N/A

Table II-6c. Personnel and Students

Chemical Engineering

Year: 2001-2002

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative	0.5	0	0.5	
Faculty (tenure-track)	7.5	0	7.5	
Other Faculty (excluding student Assistants)	0	0	0	
Student Teaching Assistants	1	2	2.28	0.30
Student Research Assistants	0	4	2.19	0.29
Technicians/Specialists	1	0	1	0.13
Office/Clerical Employees	2	0	2	0.27
Others (research assoc/asst)	2	0	2	0.27

Undergraduate Student Enrollment[1,2]	155	6	163	21.73
Graduate Student Enrollment[1,3]	15	5	15	2.00

Table II-6d. Personnel and Students

Civil, Construction and Environmental Engineering

Year: 2001-2002

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative	0.5	0	0.5	
Faculty (tenure-track)	21	1	21.5	
Other Faculty (excluding student Assistants) Instructors	1	4	2.42	
Student Teaching Assistants	1	10	6.93	0.29
Student Research Assistants	3	3	4.17	0.17
Technicians/Specialists	1	0	1	0.04
Office/Clerical Employees	9	3	10.75	0.45
Others (research assoc/asst)	5	4	7.11	0.30

Undergraduate Student Enrollment[1,2]	584	36	615	25.71
Graduate Student Enrollment[1,3]	67	9	58	2.42

Table II-6e. Personnel and Students

Computer Science

Year: 2001-2002

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative	0.5	0	0.5	
Faculty (tenure-track)	17.5	1	17.5	
Other Faculty (excluding student Assistants) Instructors	4	6	6.76	
Student Teaching Assistants	6	16	15.48	0.64
Student Research Assistants	14	11	18.75	0.77
Technicians/Specialists	5	0	5	0.21
Office/Clerical Employees	6	1	6.5	0.27
Others (research assoc/asst)	4	0	4	0.16
Undergraduate Student Enrollment[1,2]	541	56	572	23.58
Graduate Student Enrollment[1,3]	104	13	95	3.92

Table II-6f. Personnel and Students

Electrical and Computer Engineering

Year: 2001-2002

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative	0.5	0	0.5	
Faculty (tenure-track)	20.5	0	20.5	
Other Faculty (excluding student Assistants) Instructors	1	1	1.41	
Student Teaching Assistants	12	9	16.21	0.74
Student Research Assistants	27	7	30.57	1.40
Technicians/Specialists	4	0	4	0.18
Office/Clerical Employees	6	3	8.04	0.37
Others (research assoc/asst)	1	2	2.19	0.10
Undergraduate Student Enrollment[1,2]	618	42	645	29.44
Graduate Student Enrollment[1,3]	135	30	144	6.57

Table II-6g. Personnel and Students

Industrial and Manufacturing Engineering

Year: 2001-2002

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative	0.5	0	0.5	
Faculty (tenure-track)	10.5	0	10.5	
Other Faculty (excluding student Assistants) Instructors	0	2	0.97	
Student Teaching Assistants	1	4	2.78	0.24
Student Research Assistants	2	3	3.92	0.34
Technicians/Specialists	1	0	1	0.09
Office/Clerical Employees	2	0	2	0.17
Others (research assoc/asst)	1	0	1	0.09

Undergraduate Student Enrollment[1,2]	147	8	160	13.95
General Engineering Program[1,2]	144	4	143	12.47
Graduate Student Enrollment[1,3]	40	13	38	3.31

Table II-6h. Personnel and Students

Mechanical Engineering

Year: 2001-2002

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative	0.5	0	0.5	
Faculty (tenure-track)	15.5	0	14.75	
Other Faculty (excluding student Assistants) Instructors	1	3	2.15	
Student Teaching Assistants	0	9	4.38	0.26
Student Research Assistants	3	11	7.95	0.47
Technicians/Specialists	2	0	2	0.12
Office/Clerical Employees	3	1	3.75	0.22
Others (research assoc/asst)	2	1	2.5	0.15

Undergraduate Student Enrollment[1,2]	475	26	486	28.76
Graduate Student Enrollment[1,3]	53	3	43	2.54

Table II-6i. Personnel and Students

Nuclear Engineering and Radiation Health Physics

Year: 2001-2002

	HEAD COUNT		FTE	RATIO TO FACULTY
	FT	PT		
Administrative	0.5	0	0.5	
Faculty (tenure-track)	6.5	0	6.5	
Other Faculty (excluding student Assistants)	0	0	0	
Student Teaching Assistants	0	6	3.6	0.55
Student Research Assistants	0	4	2.38	0.37
Technicians/Specialists	0	0	0	0.00
Office/Clerical Employees	3.2	0	3.2	0.49
Others	4	1	4.17	0.64

Undergraduate Student Enrollment[1,2]	57	7	61	9.38
Graduate Student Enrollment[1,3]	23	3	21	3.23

Table II-6 Notes:

1. Enrollments based on end-of-term data
2. Includes freshmen and sophomores
3. Full-time graduate student is 9 or more credits

Table II-7. Faculty Salary Data
Academic Year 2001-2002

1. For the Institution as a Whole

	Professor	Associate	Assistant	Instructor
Number	454	410	341	366
High	143,182	90,000	95,924	72,871
Mean	74,544	58,749	50,304	28,676
Low	50,121	41,679	23,499	18,000

2. For the Engineering Educational Unit as a Whole

	Professor	Associate	Assistant	Instructor
Number	37	41	26	19
High	125,508	90,000	76,887	51,246
Mean	83,476	72,953	64,801	42,148
Low	69,003	61,398	57,474	32,013

3. Average Percent Salary Raises Given to Continuing Faculty Members for the Past Six (6) Years.

Unit	FY97	FY98	FY99	FY00	FY01	FY02
Institution as a Whole	6	0	6	2	5.25	2
Engineering Education Unit as a Whole	6	0	6	2	5.25	2

TABLE II-7 (Continued)

4. For Each Department Offering a Program Submitted for Evaluation

Department		Professor	Associate	Assistant	Instructor
ChE	Number	2	5	1	0
	High	105,295	81,486		
	Mean	94,727	70,526	60,003	
	Low	84,159	64,296		
CCEE	Number	12	5	6	4
	High	109,259	75,951	68,852	41,013
	Mean	88,872	72,436	65,337	40,215
	Low	69,282	70,029	63,000	39,836
CS	Number	6	8	4	9
	High	125,508	90,000	71,001	50,004
	Mean	95,362	73,833	68,627	39,534
	Low	69,003	61,884	61,506	34,974
ECE	Number	7	8	4	2
	High	113,103	86,112	76,887	51,246
	Mean	95,379	71,776	69,734	47,151
	Low	75,402	61,398	62,046	43,056
IME	Number	1	7	4	2
	High		76,050	63,900	32,616
	Mean	102,462	72,777	61,137	32,315
	Low		66,294	58,149	32,013
ME	Number	6	5	6	2
	High	108,303	81,521	67,500	46,062
	Mean	92,254	74,626	62,891	42,831
	Low	74,925	65,007	57,492	39,600
NERHP	Number	3	3	1	0
	High	96,912	76,896		
	Mean	90,264	76,272	57,474	
	Low	78,165	75,474	4	

Table II-8. Engineering Enrollment and Degree Data

Enrollments are based on fourth-week data and are not consistent with Table II-6. Part-time student information is not routinely collected with fourth-week data. Part-time students typically comprise about 6% of the students.

1st year students are those with less than 45 credits. 2nd year students are those with 45 or more credits but who have not been admitted to the Professional Program. 3rd year students are those admitted to the Professional Program for fall term. 4th year students are all other students in the Professional Program not admitted for fall term.

The "Total UG" column in the "Engineering education unit as a whole" includes Post-baccalaureate (degree seeking) students but not special (non-degree) students. The "Total UG" column in the "Program" tables includes neither Post-baccalaureate nor special students.

Engineering education unit as a whole

College of Engineering (does not include Forest Engineering):

	Fall	FT/ PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
Year			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2001	FT	938	988	491	630		3137	524				
		PT											
1	2002	FT	874	912	467	553		2915	449	420	117	21	
		PT											
2	1999	FT	833	839	471	516		2746	430	415	120	14	
		PT											
3	1998	FT	704	775	378	518		2458	410	384	123	41	
		PT											
4	1997	FT	627	729	382	526		2335	449	375	126	26	
		PT											
5	1996	FT	569	706	340	467		2082	494	346	145	34	
		PT											

Program: Chemical Engineering

Year	Fall	FT/PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2001	FT	42	45	38	36		161	21				
		PT											
1	2000	FT	39	52	37	28		156	23	36	6	2	
		PT											
2	1999	FT	42	58	20	45		165	22	32	3	0	
		PT											
3	1998	FT	36	53	26	49		164	29	40	9	3	
		PT											
4	1997	FT	37	57	30	55		179	31	40	6	1	
		PT											
5	1996	FT	25	58	33	45		161	36	29	9	4	
		PT											

Program: Civil Engineering

Year	Fall	FT/PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2001	FT	86	68	58	91		303	69				
		PT											
1	2002	FT	66	75	76	64		281	63	52	24	1	
		PT											
2	1999	FT	81	97	68	54		300	66	47	24	3	
		PT											
3	1998	FT	69	70	45	58		242	79	56	32	4	
		PT											
4	1997	FT	49	61	60	67		237	103	57	37	8	
		PT											
5	1996	FT	78	66	54	72		270	110	68	35	5	
		PT											

Program: Computer Engineering

Year	Fall	FT/PT	Enrollment Year 1st	2nd	3rd	4th	5th	Total UG	Total Grad[1]	Degrees Conferred BS	MS[1]	PhD[1]	Other
Current	2001	FT	128	100	46	50		324					
		PT											
1	2000	FT	143	90	37	58		328		35			
		PT											
2	1999	FT	105	77	55	35		272		35			
		PT											
3	1998	FT	86	92	33	34		245		23			
		PT											
4	1997	FT	86	67	29	31		213		28			
		PT											
5	1996	FT	47	71	23	27		168		20			
		PT											

Notes:

1. Total Grad, MS, PhD data reported under Electrical and Computer Engineering. Computer Engineering graduates pursue advanced degrees in Electrical and Computer Engineering

Program: Computer Science

Year	Fall	FT/PT	Enrollment Year 1st	2nd	3rd	4th	5th	Total UG	Total Grad	Degrees Conferred BS	MS	PhD	Other
Current	2001	FT	188	217	75	87		567	105				
		PT											
1	2000	FT	156	191	62	77		486	98	62	25	0	
		PT											
2	1999	FT	139	166	67	52		424	75	58	23	1	
		PT											
3	1998	FT	123	133	38	53		347	55	44	17	7	
		PT											
4	1997	FT	83	117	43	45		288	64	46	17	4	
		PT											
5	1996	FT	72	97	25	35		229	75	38	16	6	
		PT											

Program: Electrical and Computer Engineering (graduate programs only)

Year	Fall	FT/ PT	Enrollment Year 1st	2nd	3rd	4th	5th	Total UG	Total Grad	Degrees Conferred BS	MS	PhD	Other
Current	2001	FT							169				
		PT											
1	2000	FT							121		29	6	
		PT											
2	1999	FT							103		29	4	
		PT											
3	1998	FT							87		18	18	
		PT											
4	1997	FT							98		32	9	
		PT											
5	1996	FT							118		34	6	
		PT											

Program: Electrical and Electronics Engineering

Year	Fall	FT/ PT	Enrollment Year 1st	2nd	3rd	4th	5th	Total UG	Total Grad[1]	Degrees Conferred BS	MS[1]	PhD[1]	Other
Current	2001	FT	94	119	66	94		373					
		PT											
1	2000	FT	83	99	75	69		326		54			
		PT											
2	1999	FT	88	94	59	64		305		50			
		PT											
3	1998	FT	70	94	53	57		274		36			
		PT											
4	1997	FT	71	92	41	57		261		39			
		PT											
5	1996	FT	53	81	35	48		217		30			
		PT											

Notes:

1. Total Grad, MS, PhD data reported under Electrical and Computer Engineering. Electrical and Electronics Engineering graduates pursue advanced degrees in Electrical and Computer Engineering.

Program: Environmental Engineering

Year	Fall	FT/ PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2001	FT	9	20	12	11		52					
		PT											
1	2000	FT	10	25	10	15		60		17			
		PT											
2	1999	FT	21	20	17	19		77		16			
		PT											
3	1998	FT	13	10	6	2		31		6			
		PT											
4	1997	FT	16	26	8	9		59		6			
		PT											
5	1996	FT	12	13	11	5		41		0			
		PT											

Notes:

1. Total Grad, MS, PhD data reported under Civil Engineering. Environmental Engineering graduates pursue advanced degrees in Civil Engineering.

Program: Industrial and Manufacturing Engineering

Year	Fall	FT/ PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2001	FT	8	34	45	61		148	55				
		PT											
1	2000	FT	7	42	36	54		139	43	32	5	2	
		PT											
2	1999	FT	14	26	42	56		138	49	37	13	1	
		PT											
3	1998	FT	10	36	33	63		142	49	25	12	2	
		PT											
4	1997	FT	18	28	33	58		137	36	30	4	0	
		PT											
5	1996	FT	14	49	26	59		148	51	45	15	2	
		PT											

Program: Mechanical Engineering

Year	Fall	FT/ PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2001	FT	136	158	79	125		498	54				
		PT											
1	2000	FT	153	125	80	119		477	60	69	12	3	
		PT											
2	1999	FT	121	131	79	127		458	65	79	13	2	
		PT											
3	1998	FT	100	102	77	139		418	56	91	12	4	
		PT											
4	1997	FT	86	120	86	133		425	60	72	12	2	
		PT											
5	1996	FT	107	119	89	117		432	52	67	19	5	
		PT											

Program: Nuclear Engineering

Year	Fall	FT/ PT	Enrollment Year					Total UG	Total Grad	Degrees Conferred			
			1st	2nd	3rd	4th	5th			BS	MS	PhD	Other
Current	2001	FT	10	26	4	7		47	15				
		PT											
1	2000	FT	15	15	6	9		45	9	10	7	2	
		PT											
2	1999	FT	14	14	9	7		44	13	4	1	1	
		PT											
3	1998	FT	14	15	4	7		40	11	6	2	1	
		PT											
4	1997	FT	11	16	3	7		37	11	6	3	1	
		PT											
5	1996	FT	12	12	2	10		36	13	7	0	2	
		PT											

Program: Radiation Health Physics

Year	Fall	FT/ PT	Enrollment Year 1st	2nd	3rd	4th	5th	Total UG	Total Grad	Degrees Conferred BS	MS	PhD	Other
Current	2001	FT	3	7	4	4		18	12				
		PT											
1	2000	FT	1	8	1	4		14	7	4	3	3	
		PT											
2	1999	FT	4	7	4	3		18	9	7	3	1	
		PT											
3	1998	FT	5	5	5	5		20	11	6	5	0	
		PT											
4	1997	FT	4	9	2	7		22	12	6	1	0	
		PT											
5	1996	FT	3	9	6	7		25	11	8	8	0	
		PT											

Table II-9. History of Admissions Standards for Freshmen

College of Engineering (does not include Forest Engineering)

Fall	Composite ACT		Composite SAT		Percentile Rank in High School		Number of New Students Enrolled
	MIN	AVG	MIN[1]	AVG	MIN	AVG	
2001	N/A	N/A	570	1159	N/A	N/A	771
2000	N/A	N/A	640	1162	N/A	N/A	676
1999	N/A	N/A	500	1169	N/A	N/A	662
1998	N/A	N/A	630	1166	N/A	N/A	551
1997	N/A	N/A	760	1173	N/A	N/A	491
1996	N/A	N/A	620	1163	N/A	N/A	399

Notes:

1. SAT is required but not used for admission for students with high school GPA above 3.0.

Table II-10. History of Transfer Engineering Students

College of Engineering (does not include Forest Engineering)

Fall	Number of New Transfer Students Enrolled
2001	193
2000	186
1999	228
1998	199
1997	202
1996	206