PURDUE SCHOOL OF ENGINEERING AND TECHNOLOGY 2002 ASSESSMENT REPORT

Prepared by the School's Assessment Committee and Charles F. Yokomoto, Chair

July 1, 2003

Introduction

In its 2002 Assessment Annual Report, the seven department of the Purdue School of Engineering Technology submitted complete assessment reports for its programs to the Program Review and Assessment Committee (PRAC). That report included the following information:

- General outcomes for the program
- PULs associated with the general outcomes
- Measurable learning outcomes
- Where students will accomplish the learning
- How students will accomplish the learning
- Assessment methods used
- Assessment findings
- Improvements put in place and improvements planned based on assessment findings
- Implications at the campus level

This year, departments were asked to submit only the following information:

- Assessment methods used
- Changes made
- Impact of changes

The E&T Assessment committee asked its seven departments to use these as the minimum set of information to report for 2003 and to include any other information that might make their reports more understandable, in particular, their assessment findings. Links to the reports that have been submitted at this time can be found following this narrative.

The E&T Assessment Committee

The school's assessment committee has been very active since its inception in the fall semester of 1996. Under the guidance of Dr. Charles Yokomoto, Professor of Electrical and Computer Engineering, the committee has met monthly. The members of the current committee are the following:

Hasan Akay, Mechanical Engineering
Tim Diemer, Organizational Leadership and Supervision
Eugenia Fernandez, Computer Technology
Patricia Fox, Organizational Leadership and Supervision and Dean's Office
Sally Frettinger-Devor, Mechanical Engineering Technology
Marjorie Rush Hovde, Technical Communications
Laura Lucas, Construction Technology
Brian King, Electrical and Computer Engineering
Peter Orono, Freshman Engineering
Nasser Paydar, Dean's Office
Armando Pellerano, Mechanical Engineering Technology
Kenneth Reid, Electrical and Computer Engineering Technology
Ramana Pidaparti, Mechanical Engineering

Kenneth Rennels, Mechanical Engineering Technology
Erdogan Sener, Construction Technology
David Williamson, Computer Technology
Charles Yokomoto, Assessment Committee Chair, Electrical and Computer Engineering
H. Öner Yurtseven, Dean

As reported in our 2002 Annual Report, the departments in the school have developed a shared understanding of the assessment process and have adopted common principles and terminology. However, the departments were encouraged to determine their own particular ways to implement outcomes assessment. In this way, departments could tailor their process to match the organizational personality of its faculty, the accreditation requirements of its degree programs, and the characteristics of its degree programs. This decision was influenced by three major factors: (1) differences in accreditation requirements for the various departments, (2) differences in curricula, and (3) differences in faculty perceptions of how assessment can be carried out efficiently.

Seven Departments—Seven Ways of Doing Assessment

Table 1, taken from our School's 2002 annual report and updated to current times, characterizes the differences in ways that our seven departments have chosen to implement our common assessment plans. Column 2 of the table describes the whether a department's process is based on its professional accreditation of the IUPUI Principles of Undergraduate Learning (PUL). Two of the departments must satisfy the outcomes assessment requirements for their professional accreditation and have elected to be guided by the engineering accreditation criteria of the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET/EAC), four by the by the technology accreditation criteria of the Technology Accreditation Commission of ABET (ABET/TAC), and one has chosen to be guided by the IUPUI Principles of Undergraduate Learning (PUL)

Table 1. Characterization of Departmental Assessment Processes.

Department	Basis	Primary Strategy	Supplemental Sources of Assessment Data
Computer Technology (CPT)	ABET/TAC	Assessment in selected courses that cover the department's outcomes	Student self reports of well they feel they have learned the course outcomes using surveys Retention rates, graduation rates, and number of degrees conferred Continuing students satisfaction using in-house survey Alumni satisfaction Employer satisfaction
Construction Technology (CNT)	ABET/TAC	Assess actual learning in all courses taught by full-time faculty and selected courses taught by associate faculty. Each course is assigned one or more of the department's outcomes for assessment.	Student self reports of well they feel they have learned the course outcomes using surveys Retention rates, graduation rates, and number of degrees conferred Continuing students satisfaction Alumni satisfaction Employer satisfaction
Electrical and Computer Engineering (ECE)	ABET/EAC	Assess selected courses with strong emphasis on the senior capstone design course and the senior ethics course.	Focus group discussion with seniors Retention rates, graduation rates, and number of degrees conferred Continuing students satisfaction using in-hours survey Alumni satisfaction Employer satisfaction
Electrical Engineering Technology (EET)	ABET/TAC	Assess how well students feel they have learned the	Continuing students satisfaction Senior capstone project

		course objectives/ outcomes using surveys	Student works in selected courses Retention rates, graduation rates, and number of degrees conferred Alumni satisfaction Employer satisfaction
Mechanical Engineering (ME)	ABET/EAC	Assess student self reports of confidence in the course outcomes	Capstone design course Student works (artifacts) in selected courses Student self reports of well they feel they have learned the course outcomes using surveys Retention rates, graduation rates, and number of degrees conferred Continuing students satisfaction Alumni satisfaction Employer satisfaction Exit interview
Mechanical Engineering Technology (MET)	ABET/TAC	Assess actual learning through comprehensive exam or portfolio, depending on the degree program	Student works (artifacts) in selected courses Student self reports of well they feel they have learned the course outcomes using surveys Retention rates, graduation rates, and number of degrees conferred Continuing students satisfaction Alumni satisfaction Employer satisfaction
Organizational Leadership and Supervision (OLS)	PUL	Assess actual learning in selected courses, including the required senior research project course	Graduating senior survey Passing rate on certificate program Retention rates, graduation rates, and number of degrees conferred Continuing students satisfaction Alumni satisfaction Employer satisfaction

For accreditation, engineering faculty and technology faculty must demonstrate student accomplishment of eleven learning outcomes. The EAC and TAC outcomes are similar but not the same, and both sets map quite well into the PULs. Rather than developing a complex outcomes assessment process where both the ABET outcomes and PUL outcomes are assessed, the ABET directed programs have chosen a strategy of assessing the ABET outcomes and demonstrating through a relational matrix that the eleven ABET outcomes give good coverage of the PULs.

To show that the eleven ABET outcomes for EAC and for TAC map into the PULs, two tables were developed, Table 2 for engineering programs and Table 3 for technology programs. The engineering mapping differs slightly from the technology matrix in that it demonstrates the quality of the linkage, rating the linkage as strong, moderate, or mild. Both tables show that the eleven ABET outcomes adequately cover the PULs.

Web Sites that Describe Our Assessment Processes

Further information on our assessment processes can be found on the Web. Power Point slide shows that describe the outcomes assessment process of the Mechanical Engineering Department by Hasan Akay, the Organizational Leadership and Supervision Department by Cliff Goodwin, and the School of Engineering and Technology by Charlie Yokomoto can be viewed at

http://www.planning.iupui.edu/prac/minutes/2001-2002/PRAC%20Presentations/dec01/Akay_ME_Dec_files/v3_document.htm (ME),

http://www.planning.iupui.edu/prac/minutes/2001-2002/PRAC%20Presentations/dec01/Engin_Goodwin_Dec_files/v3_document.htm (OLS), and

http://www.planning.iupui.edu/prac/minutes/2001-2002/PRAC%20Presentations/dec01/Yokomoto_Parts%201%20and%202_files/frame.htm (E&T).

Findings, Changes, and Impact of Changes For 2003

We invite you to browse through our departmental 2003 reports that have been submitted to date. Several departments have chosen to submit full reports that include all of the information from their 2002 reports in addition to this year's information. Some departments chose to submit only the updated information. Last year's reports may be found on the PRAC web site at http://www.planning.iupui.edu/prac.

For their 2002 reports which were submitted in conjunction with IUPUI's North Central Accreditation visit, the departments submitted information for all of their departmental outcomes. The 2003 reports, however, do not report updated information on all of their outcomes, as departments have adopted a process where the assessment of all outcomes has been distributed over a period of semesters or years. Thus, outcomes that were not assessed in 2002-2003 will be assessed in 2003-2004 or 2004-2005 at the latest.

TABLE 2. PULS COVERED BY ABET/EAC CRITERION 3, ITEMS A-K

Created by David Bostwick, Oct. 15, 1999

Revised by Hasan Akay and Charlie Yokomoto, May 21, 2002

3 = strong linkage, 2 = moderate linkage, 1 = mild linkage

ABET/EAC CRITERIA #3, items a through k	PULs COVERED BY THE ABET/EAC a-k																					
	PUL 1					PUL 2					PUL 3			PUL 4			PUL 5			PUL 6	
	Core Communication and Quantitative Skills					Critical Thinking					Integration and Application of Knowledge			Intellectual Depth, Breadth, and Adaptiveness			Understand Society and Culture			Values and Ethics	
	a	b	c	d	e	a	b	c	d	e	a	b	c	a	b	c	a	b	c	a	b
(a) - An ability to apply knowledge of mathematics, science and engineering				3		2	2		2	2	2	3	2	3	2						
(b) - An ability to design and construct experiments as well as to analyze and interpret data						3	3	3	2			2		3	1	2					
(c) - An ability to design a system, component, or process to meet desired needs						2	2	3	3	1	3	2	3	3		3					
(d) - An ability to function on multi-disciplinary teams			2												1	3			2		
(e) - An ability to identify, formulate and solve engineering problems		2		3		3	3	3	3	3	3	3	3	3	1	2					
(f) - An understanding of professional and ethical responsibility						2	3					2	1		3	2	1	1	2	3	1
(g) - An ability to communicate effectively	3		3																		
(h) - The broad education necessary to understand the impact of engineering solutions in global societal context											1	2	2			2	2	2		2	
(i) - A recognition of the need for and an ability to engage in life-long learning		3			2		2														
(j) - A knowledge of contemporary issues		2								1					1			2			2
(k) - An ability to use the techniques, skill and modern engineering tools necessary for engineering practice					3							3	2	3							

PULS OVERED BY ABET/EAC CRITERION 3, ITEMS A-K

Created by David Bostwick, Oct. 15, 1999

Revised by Laura Lucas, Eugenia Fernandez, Ken Rennels, Rich Pfile, and Charlie Yokomoto, Dec. 2001

ABET OUTCOMES *TAC CRITERIA #1 items (a) to (k)*	**PRINCIPLES OF UNDERGRADUATE LEARNING ADDRESSED**																				
	# ONE					**# TWO**					**# THREE**			**# FOUR**			**# FIVE**			**# SIX**	
	Core Communication and Quantitative Skills					Critical Thinking					Integration and Application of Knowledge			Intellectual Depth, Breadth, and Adaptiveness			Understand Society and Culture			Values and Ethics	
	a	**b**	**c**	**d**	**e**	**A**	**b**	**c**	**d**	**e**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**	**c**	**a**	**b**
(a) - Demonstrate an appropriate mastery of the knowledge, techniques, skills and modern tools of their discipline				⑨	⑨							⑨		⑨							
(b) – Apply current knowledge and adapt to emerging applications in mathematics, science, engineering and technology						⑨	⑨		⑨	⑨			⑨	⑨		⑨					
(c) - Conduct, analyze and interpret experiments and apply experimental results to improve processes		⑨				⑨		⑨		⑨				⑨							
(d) – Apply creativity in the design of systems, components or processes appropriate to program objectives							⑨		⑨				⑨	⑨		⑨					⑨
(e) – Function effectively on teams			⑨																⑨		
(f) - Identify, analyze and solve technical problems		⑨		⑨		⑨	⑨	⑨	⑨					⑨		⑨					
(g) - Communicate effectively	⑨		⑨								⑨								⑨		
(i) - Understand professional, ethical and societal responsibilities						⑨						⑨						⑨		⑨	
(j) - Recognize contemporary professional, societal and global issues and be aware of and respect diversity										⑨		⑨	⑨		⑨		⑨	⑨	⑨	⑨	
(k) - Have a commitment to quality, timeliness and continuous improvement					⑨					⑨	⑨					⑨				⑨	

The reports of the seven departments in the School of Engineering and Technology are linked as follows:

Attachment A: Computer Technology (CPT)
Attachment B: Construction Technology (CNT)
Attachment C: Electrical and Computer Engineering (ECE)
Attachment D: Electrical and Computer Engineering Technology (ECET)
Attachment E: Freshman Engineering (to be submitted at a later date)
Attachment F: Mechanical Engineering (ME)
Attachment G: Mechanical Engineering Technology (MET) (to be submitted at a later date)
Attachment H: Organizational Leadership and Supervision (OLS)

CPT 2002-2003 AY ASSESSMENT NARRATIVE

History

1995-96: The E&T Assessment Committee engaged in lengthy discussions on possible approaches to carrying out its assessment responsibilities. By the end of the year, the committee agreed, in spirit, to model its plan after the plan developed at Rose-Hulman Institute of Technology, modified to suit the particulars of our school.

1996-97: E&T Assessment Committee revised its plan, building upon the plan developed at the Rose-Hulman Institute of Technology

1997-98: CPT Department developed statements of mission, goals, and objectives.

Departments start work on learning objectives at the course level for the Spring semester.

1998-99 The School begins collecting assessment data from each department.

Assessment artifacts are collected from 3 CPT courses.

1999-00 CPT department starts identifying which ABET TAC outcomes each CPT course addressed and writing Measurable Learning Outcomes and Course Instructional Objectives for each course. 17 of 38 courses are completed.

Assessment artifacts collected from 4 CPT courses.

2000-01 CPT department continues to identify the ABET TAC outcomes, Measurable Learning Outcomes and Course Instructional Objectives for each course. 35 of our 40 courses were completed.

CPT department works with our Industrial Advisory Committee to write Measurable Learning Outcomes for each of the ABET TAC Criteria.

Assessment artifacts collected from 3 more CPT courses.

2001-02 CPT completes its work on identifying ABET TAC outcomes, Measurable Learning Outcomes and Course Instructional Objectives for each course, and start work on a process to include this information on the Web-based summary page for each course.

18 sets of assessment artifacts collected from CPT courses.

2002-03 CPT completes work on including ABET TAC and PUL outcomes along with Course Instructional Objectives on the Web-based summary page for each course.

14 sets of assessment artifacts collected from CPT courses.

Our Assessment Process

The CPT Department decided to use the ABET TAC Criterion as the basis for their assessment efforts. Measurable Learning Outcomes (MLOs) were developed for each criterion. For most of the MLOs, assignments which address the MLOs were selected for assessment. Artifacts are collected and assessed. Results were then tabulated and are presented in the tables. This year, we focused on identifying the impact of improvements and changes made as a result of prior assessment. By addressing the set of ABET TAC Criteria, the CPT Department believes that the Principles of Undergraduate Learning are also assessed.

To ease the collection of data, the CPT Department has used the Assessment Checklist developed by Professor Laura Lucas in Construction Technology. This checklist transforms the above mentioned process into a series of easily followed action items. This checklist was used to collect artifacts during the 2002-2003 academic year. Revisions to the checklist are planned to make its use more intuitive for faculty. At the beginning of each semester, each full-time or Associate Faculty will be assigned one MLO to assess using this checklist. Use of the revised checklist will enable us to expand our coverage of the MLOs, to include our Associate Faculty in the assessment process, and will streamline the collection of assessment data.

Other Information

The CPT Department has continued its alliance with the TechWizards program coordinated by the Indiana Youth Institute (IYI). In this alliance, IYI subsidizes IT projects for youth-serving non-profit organizations in Indiana. These projects are completed by CPT students under the supervision of a CPT faculty member. To date, 22 projects have been completed, all with positive results.

Effective Spring 2003, the CPT Department revised its Standard and Business Plans of Study and introduced two new tracks in Networking and Web Development.

DEPARTMENT OF COMPUTER TECHNOLOGY 2003 ANNUAL REPORT
Associate of Science Degree Program
Prepared by Eugenia Fernandez, May 31, 2003

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
ABET TAC Outcome (a) : Demonstrate an appropriate mastery of the knowledge, techniques, skills and modern tools of their discipline.	1(d), 1(e), 3(b), 4(a), 4(b)	a1. Explain the terminology and basic concepts of information technology.	Assessed in CPT 115 using comprehensive final	Only 61% of students in CPT 115 scored 80% or more on the final.	The course was redesigned to use short lectures utilizing active learning techniques in conjunction with the completion of small projects.	Only 44% of students in CPT 115 scored 80% or more on the final.	Performance declined. May be attributable to first-time offering. Future sections will provide more in-class activities tied more explicitly to course objectives.

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
		a2. Demonstrate a proficient level of competency in word processing, spreadsheet, database, graphical presentation, Internet browser and Web publishing software.	Assessed in CPT 106 using a "Putting it All Together" project and final course grade and in CPT 223 by the final course grade	Only 69% of the students in CPT 106 earned a C or better grade. In CPT 106 72% of the students earned a C or better on the project. 87% of the students in CPT 223 earned a C or better grade.	In CPT the following changes were made: In collaboration with University College, a student tutoring program, led by previous CPT 106 students, was implemented. An online Skills Assessment Manager was used to test student proficiency in the software. This tool also provides practice tests for students. Web design concepts were eliminated from CPT 106 since they are taught in CPT 223. This provides students with more time to study the other applications. Coverage of vocabulary and basic computer concepts was added to the course. For CPT 223, no improvements were needed since our goal was met.	73% of the students in CPT 106 earned a C or better on the project.	Performance on the project in CPT 106 continues to be satisfactory,.
		a3. Demonstrate mastery of general object oriented concepts.	CPT 254 via completion of a homework assignment requiring application of OO concepts.	90% of the students earned 75% or more on the assignment.	No improvements were needed since our goal was met.	N/A	N/A

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
		a4. Demonstrate mastery of systems development methodologies.	CPT 254 via completion of a homework assignment on a system development technique.	Only 32% of the students earned a 75% or better on the assignment.	In the last year, the course was changed to focus on object oriented (OO) development concepts. For next year, the textbook was changed to one which better explains OO concepts. Assignments have been structured as a series of small interrelated components.	93% of the students earned a 75% or better on the assignment.	Performance now meets our goal.
		a5. Write a program using an object oriented programming language.	CPT 262 with the completion of an object-oriented program	85% of the students earned 75% or better on the program.	No improvements were needed since our goal was met.	64% of the students earned 75% or better on the object-oriented design of their program.	Performance no longer meets our goal. Course requirements will be changed to include UML object analysis diagrams for each program. More frequent and earlier coverage of OOP design will be introduced.
ABET TAC Outcome (b): Apply current knowledge and adapt to emerging applications in technology.	2(d), 2(e), 3(a), 3(c), 4(a), 4(b), 4(c)	b1. Apply systems theory, logic & statistics, and object oriented to problem solving and decision making.	CPT 220 by Lab Assignment	89% of the students earned 75% or better on this assignment.	No improvements were needed since our goal was met.	N/A	N/A
		b2. Design a logical data model for a given application.	CPT 288 with completion of OR modeling homework assignment.	86% of the students earned 75% or better on this assignment.	No improvements were needed since our goal was met.	N/A	N/A

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
		b3. Create, manipulate and maintain database systems.	CPT 288 through demonstration of database manipulation using SQL and SQL Exam	Less than 70% of the students earned 75% or more on this assignment and exam.	Instituted a series of SQL quizzes. Created more homework assignments on SQL. Switched to a book which better emphasizes database relationships and uses case study examples.	Not yet assessed.	N/A
		b4. Transfer current knowledge to new technologies such as new or different software applications					
		b5. Be able to decompose large complex problems into subsystems.	CPT 254 with Use Case Analyses	81% of the students earned 75% or more on their assignment.	No improvements were needed since our goal was met.	N/A	N/A
		b6. Be able to synthesize abstract subsystem solutions into an overall solution					
ABET TAC Outcome (c): Conduct, analyze, interpret and document testing experiments and apply experimental results to improve processes.	1(b), 2(a), 2(b), (c), 4(a),	c1. Use programming logic, critical thinking and debugging skills in hardware and software troubleshooting.	In CPT 233 students complete a series of labs related to hardware and software troubleshooting. Assessed via Exam Questions.	96% of the students earned 75% or more on this subset of exam questions.	No improvements were needed since our goal was met.	N/A	N/A
		c2. Use statistical techniques to perform analysis to determine the reliability and performance of system components.					

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
		c3. Conduct usability tests of an application and apply the results in revising the application.					
		c4. Check system requirements against user needs.	In CPT 254 students describe system requirements using CRC method.	75% of the students earned 75% or better on this assignment.	No improvements were needed since our goal was met.	N/A	N/A
ABET TAC Outcome (d): Apply creativity in the design of systems, components or processes appropriate to program objectives.	4(b)	d1. Model a process in systems terms.					
		d2. Create analysis and design deliverables for information technology applications.	In CPT 254 students write a Design Specification Report.	In 254, only 30% of the student groups scored above a 3 (on a 1-5 scale) on the Critical Thinking Holistic Rubric.	Course has been changed to use object-oriented analysis & design techniques only. Replaced one large deliverable with a series of smaller components.	81% of the students earned 80% or more on this assignment.	Performance now meets our goal.
		d3. Integrate industry standard components into the design of a comprehensive computer solution	In CPT 140 students produce a fully documented "run book" for a program.	80% of the students scored above a 3 (on a 1-5 scale) on the Holistic Mastery Rubric.	No improvements were needed since our goal was met.	N/A	N/A
ABET TAC Outcome (e): Function effectively on teams.	1(c), 3(a), 3(b), 3(c), 4(c), 5(c)	e1. Effectively work within a team environment to accomplish project tasks.					
		e2. Demonstrate a working knowledge of essential teamwork skills					
		e3. Realistically self-evaluate their ability to work in teams at a satisfactory level					
		e4. Demonstrate conflict resolution skills.					

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
ABET TAC Outcome (f): Identify, analyze, and solve technical problems.	1(d), 2(a), 2(b), 2(c) 2(d), 3(a), 3(c), 4(c),	f1. Design and implement backup & recovery strategies for a system.					
		f2. Apply a problem solving protocol to the solution of technical problems.					
		f3. Document technical problems and their attempted solutions.					
ABET TAC Outcome (g): Communicate effectively.	1(a), 1(c)	g1. Prepare professional reports to communicate project findings & recommendations to a target audience.	TCM 220 students write a technical report	In TCM 220, no student work earned scores >3.5 (on 1-5 scale) on the "Criteria for Assessing Students' Workplace Writing Abilities" rubric except on organization and length.	Add more writing assignments in lower division courses.	Not yet assessed.	N/A
		g2. Write reports that document the steps and procedures for implementing a given system.					

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
		g3. Adapt written and oral communications to target audiences including those outside the profession. g4. Make a clear, concise, well-paced formal presentation.	TCM 220 with Oral presentation.	Students scored >= 3.5 (on 1-5 scale) on all items on the "Criteria for Assessing Students' Workplace Speaking Abilities" rubric except for content, assumptions and conclusions.	More emphasis will be placed on these items in the TCM 220 course. Add more oral presentations to CPT content courses.		
		g5. Demonstrate effective listening skills.					
ABET TAC Outcome (h): Recognize the need for and possess the ability to pursue lifelong learning.	6(b)	h1. Subscribe to and read several technical journals.			Survey graduating seniors (a planned improvement).	Not yet implemented.	
		h2. Research current and emerging technologies.					
		h3. Obtain advanced degrees					
		h4. Attend continuing education workshops and courses, regardless of discipline.					
		h5. Obtain professional certifications and licensures.					
ABET TAC Outcome (i): Understand professional,	3(a), 3(b), 5(c), 6(a)	i1. Identify the professional and ethical standards that govern information technology.					

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
ethical and societal responsibilities.		i2. Become active members of local community, professional or otherwise.	Assessed through student participation in the TechWizards program and NPower Inoculation Projects.	22 students completed IT projects for youth-serving non-profit organizations through the TechWizards program. 30 students volunteered for NPower's non-profit Inoculation Project.	No improvements were needed since our goal was met.	N/A	N/A
ABET TAC Outcome (j): Recognize contemporary professional, societal and global issues and be aware of and respect diversity.	2(e), 4(c), 5(a), 5(b), 5(c), 6(a)	j1. Discuss the impact of computer technologies on society through examination of various legal, international, social, and commercial issues.					
		j2. Explain design issues sensitive to the needs of disabled users.					
ABET TAC Outcome (k): Have a commitment to quality, timeliness and continuous improvement.	1(e), 2(d), 2(e), 3(b), 3(c), 4(c), 6(a)	k1. Identify and incorporate quality into production and service oriented systems.					
		k2. Assume technical leadership or coordinating role in courses.					
		k3.Identify personal and professional goals and develop plans of action to achieve them					

DEPARTMENT OF COMPUTER TECHNOLOGY BS 2003 ASSESSMENT REPORT

Bachelor of Science Degree Program

Prepared by Eugenia Fernandez, May 31, 2003

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
ABET TAC Outcome (a) : Demonstrate an appropriate mastery of the knowledge, techniques, skills and modern tools of their discipline.	1(d), 1(e), 3(b), 4(a), 4(b)	a1. Explain the terminology and basic concepts of information technology.	Assessed in CPT 115 using comprehensive final	Only 61% of students in CPT 115 scored 80% or more on the final.	The course was redesigned to use short lectures utilizing active learning techniques in conjunction with the completion of small projects.	Only 44% of students in CPT 115 scored 80% or more on the final.	Performance declined. May be attributable to first-time offering. Future sections will provide more in-class activities tied more explicitly to course objectives.

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
		a2. Demonstrate a proficient level of competency in word processing, spreadsheet, database, graphical presentation, Internet browser and Web publishing software.	Assessed in CPT 106 using a "Putting it All Together" project and final course grade and in CPT 223 by the final course grade	Only 69% of the students in CPT 106 earned a C or better grade. In CPT 106 72% of the students earned a C or better on the project. 87% of the students in CPT 223 earned a C or better grade.	In CPT the following changes were made: In collaboration with University College, a student tutoring program, led by previous CPT 106 students, was implemented. An online Skills Assessment Manager was used to test student proficiency in the software. This tool also provides practice tests for students. Web design concepts were eliminated from CPT 106 since they are taught in CPT 223. This provides students with more time to study the other applications. Coverage of vocabulary and basic computer concepts was added to the course. For CPT 223, no improvements were needed since our goal was met.	73% of the students in CPT 106 earned a C or better on the project.	Performance on the project in CPT 106 continues to be satisfactory,.
		a3. Demonstrate mastery of general object oriented concepts.	CPT 254 via completion of a homework assignment requiring application of OO concepts.	90% of the students earned 75% or more on the assignment.	No improvements were needed since our goal was met.	N/A	N/A

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
		a4. Demonstrate mastery of systems development methodologies.	CPT 254 via completion of a homework assignment on a system development technique.	Only 32% of the students earned a 75% or better on the assignment.	In the last year, the course was changed to focus on object oriented (OO) development concepts. For next year, the textbook was changed to one which better explains OO concepts. Assignments have been structured as a series of small interrelated components.	93% of the students earned a 75% or better on the assignment.	Performance now meets our goal.
		a5. Write a program using an object oriented programming language.	CPT 262 with the completion of an object-oriented program	85% of the students earned 75% or better on the program.	No improvements were needed since our goal was met.	64% of the students earned 75% or better on the object-oriented design of their program.	Performance no longer meets our goal. Course requirements will be changed to include UML object analysis diagrams for each program. More frequent and earlier coverage of OOP design will be introduced.
ABET TAC Outcome (b): Apply current knowledge and adapt to emerging applications in technology.	2(d), 2(e), 3(a), 3(c), 4(a), 4(b), 4(c)	b1. Apply systems theory, logic & statistics, and object oriented to problem solving and decision making.	CPT 220 by Lab Assignment	89% of the students earned 75% or better on this assignment.	No improvements were needed since our goal was met.	N/A	N/A
		b2. Design a logical data model for a given application.	CPT 288 with completion of OR modeling homework assignment.	86% of the students earned 75% or better on this assignment.	No improvements were needed since our goal was met.	N/A	N/A

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
		b3. Create, manipulate and maintain database systems.	CPT 288 through demonstration of database manipulation using SQL and SQL Exam	Less than 70% of the students earned 75% or more on this assignment and exam.	Instituted a series of SQL quizzes. Created more homework assignments on SQL. Switched to a book which better emphasizes database relationships and uses case study examples.	Not yet assessed.	N/A
		b4. Transfer current knowledge to new technologies such as new or different software applications	CPT 325 using Heuristic Analysis	81% of the students earned 80% or better on this assignment	No improvements were needed since our goal was met.	84% of the students earned 80% or better on this assignment	Performance continues to be satisfactory.
		b5. Be able to decompose large complex problems into subsystems.	CPT 254 and CPT 313 with Use Case Analyses	81% of the students in CPT 254 earned 75% or more on their assignment. 76% of the students in CPT 313 earned 80% or more on this assignment.	No improvements were needed since our goal was met.	N/A	N/A
		b6. Be able to synthesize abstract subsystem solutions into an overall solution					
ABET TAC Outcome (c): Conduct, analyze, interpret and document testing experiments	1(b), 2(a), 2(b), (c), 4(a),	c1. Use programming logic, critical thinking and debugging skills in hardware and software troubleshooting.	In CPT 233 students complete a series of labs related to hardware and software troubleshooting. Assessed via Exam Questions.	96% of the students earned 75% or more on this subset of exam questions.	No improvements were needed since our goal was met.	N/A	N/A

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
and apply experimental results to improve processes.		c2. Use statistical techniques to perform analysis to determine the reliability and performance of system components.	CPT 320 using March Madness Exercise	100% of the students earned 80% or more on this assignment.	No improvements were needed since our goal was met.	N/A	N/A
		c3. Conduct usability tests of an application and apply the results in revising the application.	CPT 325 via a Usability Test Report	75% of the students earned 80% or more on this assignment	No improvements were needed since our goal was met.	N/A	N/A
		c4. Check system requirements against user needs.	In CPT 254 students describe system requirements using CRC method.	75% of the students earned 75% or better on this assignment.	No improvements were needed since our goal was met.	N/A	N/A
ABET TAC Outcome (d): Apply creativity in the design of systems, components or processes appropriate to program objectives.	4(b)	d1. Model a process in systems terms.					
		d2. Create analysis and design deliverables for information technology applications.	In CPT 254 students write a Design Specification Report. In CPT 374 and CPT 384 students, write a single report compiled from work by the entire class.	In 254, only 30% of the student groups scored above a 3 (on a 1-5 scale) on the Critical Thinking Holistic Rubric. In 384, the class earned an A- on their group report. In 374 the class earned a B on their group report	Course has been changed to use object-oriented analysis & design techniques only. Replaced one large deliverable with a series of smaller components. No improvements were needed in 374 and 384 since our goal was met.	81% of the students earned 80% or more on this assignment.	Performance now meets our goal.
		d3. Integrate industry standard components into the design of a comprehensive computer solution	In CPT 140 students produce a fully documented “run book” for a program.	80% of the students scored above a 3 (on a 1-5 scale) on the Holistic Mastery Rubric.	No improvements were needed since our goal was met.	N/A	N/A

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
ABET TAC Outcome (e): Function effectively on teams.	1(c), 3(a), 3(b), 3(c), 4(c), 5(c)	e1. Effectively work within a team environment to accomplish project tasks.	CPT 374 using Peer evaluations	82% of the students scored above a 3 (on a 1-5 scale) on their peer evaluations.	No improvements were needed since our goal was met.	N/A	N/A
		e2. Demonstrate a working knowledge of essential teamwork skills	CPT 374 using a Teamwork Survey	82% of the students scored above a 3 (on a 1-5 scale) on the Teamwork Rubric.	No improvements were needed since our goal was met.	N/A	N/A
		e3. Realistically self-evaluate their ability to work in teams at a satisfactory level	CPT 374 using a Teamwork Survey	82% of the students scored above a 3 (on a 1-5 scale) on the Teamwork Rubric	No improvements were needed since our goal was met.	N/A	N/A
		e4. Demonstrate conflict resolution skills.					
ABET TAC Outcome (f): Identify, analyze, and solve technical problems.	1(d), 2(a), 2(b), 2(c) 2(d), 3(a), 3(c), 4(c),	f1. Design and implement backup & recovery strategies for a system.					
		f2. Apply a problem solving protocol to the solution of technical problems.	Final Lab in CPT 426	90% of the students earned 80% or more on this lab.	No improvements were needed since our goal was met.	N/A	N/A
		f3. Document technical problems and their attempted solutions.	CPT 402 via a Wiring Lab	75% of the students earned 80% or more on this lab.	No improvements were needed since our goal was met.	N/A	N/A

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
ABET TAC Outcome (g): Communicate effectively.	1(a), 1(c)	g1. Prepare professional reports to communicate project findings & recommendations to a target audience.	TCM 220 students write a technical report Students write a group project report in CPT 374 and case study analyses in CPT 410.	In TCM 220, no student work earned scores >3.5 (on 1-5 scale) on the "Criteria for Assessing Students' Workplace Writing Abilities" rubric except on organization and length. In CPT 410, 83% of the students scored an average of 4 (on 1-4 scale) on the Holistic Writing Rubric. In CPT 374, the class group report earned a B on their report.	Add more writing assignments in lower division courses. No improvements were needed in the upper division courses since our goal was met.	Not yet assessed.	N/A
		g2. Write reports that document the steps and procedures for implementing a given system.					

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
		g3. Adapt written and oral communications to target audiences including those outside the profession. g4. Make a clear, concise, well-paced formal presentation.	TCM 220 with Oral presentation.	Students scored >= 3.5 (on 1-5 scale) on all items on the "Criteria for Assessing Students' Workplace Speaking Abilities" rubric except for content, assumptions and conclusions.	More emphasis will be placed on these items in the TCM 220 course. Add more oral presentations to CPT content courses.		
		g5. Demonstrate effective listening skills.					
ABET TAC Outcome (h): Recognize the need for and possess the ability to pursue lifelong learning.	6(b)	h1. Subscribe to and read several technical journals.			Survey graduating seniors (a planned improvement).	Not yet implemented.	
		h2. Research current and emerging technologies.					
		h3. Obtain advanced degrees					
		h4. Attend continuing education workshops and courses, regardless of discipline.					
		h5. Obtain professional certifications and licensures.					
ABET TAC Outcome (i): Understand professional, ethical and societal responsibilities.	3(a), 3(b), 5(c), 6(a)	i1. Identify the professional and ethical standards that govern information technology.	CPT 410 through Case studies and discussion, students develop a Personal Code of Ethics tied to industry ethical standards.	80% of the students scored a 4 average (on a 1-4 scale) on the Holistic Critical Thinking Rubric.	No improvements were needed since our goal was met.	N/A	N/A

General outcomes	Associated PULs	Measurable Outcomes	Methods used to assess the outcomes	Assessment findings (baseline)	Improvements (changes) put into place based on assessment findings	Assessment findings (current)	Impact of changes that were put in place
		i2. Become active members of local community, professional or otherwise.	Assessed through student participation in the TechWizards program and NPower Inoculation Projects.	22 students completed IT projects for youth-serving non-profit organizations through the TechWizards program. 30 students volunteered for NPower's non-profit Inoculation Project.	No improvements were needed since our goal was met.	N/A	N/A
ABET TAC Outcome (j): Recognize contemporary professional, societal and global issues and be aware of and respect diversity.	2(e), 4(c), 5(a), 5(b), 5(c), 6(a)	j1. Discuss the impact of computer technologies on society through examination of various legal, international, social, and commercial issues.					
		j2. Explain design issues sensitive to the needs of disabled users.					
ABET TAC Outcome (k): Have a commitment to quality, timeliness and continuous improvement.	1(e), 2(d), 2(e), 3(b), 3(c), 4(c), 6(a)	k1. Identify and incorporate quality into production and service oriented systems.					
		k2. Assume technical leadership or coordinating role in courses.					
		k3.Identify personal and professional goals and develop plans of action to achieve them					

CNT BS (Constr/art) Degree, sp02vs fa02

Measurable outcomes (desired behaviors)	Assoc. PUL's	Methods used to access the desired behaviors		What are the assessment findings? Baseline of SPRING 02		What improvements (and changes) have you made based on assessment findings?	What are the assessment findings? Current findings of FALL 02		Impact of changes that were put in place
TAC-ABET,	Related PUL's	COURSE WHERE TAUGHT course numbers; ART=Arch; CET=Civil; CNT=Constr	WORK ITEM TYPE: CA=Computer assmt;FX=Final Exam; GPJ=Group proj.; IPJ=Indiv Proj;IR=Internship Report;J=Journal;LG=Lab Group;LR=Lab Report;OP=Oral Pres.;P=Portfolio; PJB=Project Board;PSH=prob. Solv Homework;PSQ=PrSol. Quizz; PSX=Pr Solv Exam xx=course grade	Percentage of students from class that met the goal (of 60%)	Dd each course meet the goal?	What improvements (and changes) have you made based on assessment findings?	Percentage of students from class that met the goal (of 60%)	Did each course meet the goal?	
a- Mastery of Discipline	1d,e,	ART 120	IPJ	92%	YES	goal met; monitor	91%	YES	
a- Mastery of Discipline	3b	ART 222	FX,GPJ,TX	na	na	not taught, baseline	50%	no	UNDER GOAL
a- Mastery of Discipline	4a,b	ART 285	xx	na	na	not taught, baseline	43%	no	UNDER GOAL
a- Mastery of Discipline		CET 231	FX	75%	YES	goal met; monitor	na	na	
a- Mastery of Discipline		CET 452	TX,FX	50%	no	see course listings	81%	YES	
a- Mastery of Discipline		CNT 280	FX	79%	YES	goal met; monitor	45%	no	UNDER GOAL
a- Mastery of Discipline		CNT 330	xx		na	not taught, baseline	100%	YES	
a- Mastery of Discipline		CNT 447			na	not taught, baseline	na	na	
a- Mastery of Discipline		CNT 470			na	not taught, baseline	na	na	
a- Mastery of Discipline		CNT 494	CA,IBJ,PSH,FX	50%	no	not taught, baseline	na	na	
				69%	**YES**	for this ABETobj.;	**68%**	**YES**	**ave still meets goal**
b- Apply knowledge	2d,e	CET 452	TX,FX		na	not taught, baseline	81%	YES	
b- Apply knowledge		CNT 494	CA,IBJ,PSH,FX	50%	no	see course listings	na	na	
				50%	**no**	for this ABETobj.;	**81%**	**YES**	**ave NOW meets goal**
c-analysis and interpret	1b	ART 165	PSX	70%	YES	goal met; monitor	50%	no	UNDER GOAL
c-analysis and interpret	2a,b,c	CET 104	LR;xx	67%	YES	goal met; monitor	89%	YES	
c-analysis and interpret	4a	CET 160	PSH;xx	72%	YES	goal met; monitor	79%	YES	
c-analysis and interpret		CET 231	FX	75%	YES	goal met; monitor	na	na	
c-analysis and interpret		CET 267	FX;xx	79%	YES	goal met; monitor	90%	YES	
c-analysis and interpret		CET 312	PSH		na	not taught, baseline	80%	YES	
				79%	**YES**	for this ABETobj.;	**78%**	**YES**	**ave still meets goal**
d-Apply Creativity	4b	ART 155	IPJ	76%	YES	goal met; monitor	88%	YES	
d-Apply Creativity		ART 222	FX,GPJ,TX	100%	YES	goal met; monitor	50%	no	UNDER GOAL
d-Apply Creativity		CET 267	xx	79%	YES	goal met; monitor	90%	YES	
d-Apply Creativity		CNT 494		50%	no	see course listings	na	na	
				76%	**YES**	for this ABETobj.;	**76%**	**YES**	**ave still meets goal**
e- Team member	1c	ART 222	FX,GPJ,TX	na	na	goal met; monitor	50%	no	UNDER GOAL
e- Team member	3a,b,c	CNT 330	xx		na	not taught, baseline	100%	YES	
e- Team member	4c	CNT 447			na	not taught, baseline	na	na	

CNT BS (Constr/art) Degree, sp02vs fa02

Measurable outcomes (desired behaviors)	Assoc. PUL's	Methods used to access the desired behaviors		What are the assessment findings? Baseline of SPRING 02		What improvements (and changes) have you made based on assessment findings?	What are the assessment findings? Current findings of FALL 02		Impact of changes that were put in place
TAC-ABET,	Related PUL's	COURSE WHERE TAUGHT course numbers; ART=Arch; CET=Civil; CNT=Constr	WORK ITEM TYPE: CA=Computer assmt;FX=Final Exam; GPJ=Group proj.; IPJ=Indiv Proj;IR=Internship Report;J=Journal;LG=Lab Group;LR=Lab Report;OP=Oral Pres.;P=Portfolio; PJB=Project Board;PSH=prob. Solv Homework;PSQ=PrSol. Quizz; PSX=Pr Solv Exam xx=course grade	Percentage of students from class that met the goal (of 60%)	Dd each course meet the goal?	What improvements (and changes) have you made based on assessment findings?	Percentage of students from class that met the goal (of 60%)	Did each course meet the goal?	
e- Team member	5c	CNT 470			na	not taught, baseline	na	na	
				NA	**NA**	for this ABETobj.;	**75%**	**YES**	**ave NOW meets goal**
f- solve tech problems	1d	ART 117	FX;PSH	68%	YES	goal met; monitor	38%	no	UNDER GOAL
f- solve tech problems	2a,b,c,d	CET 104	xx	67%	YES	goal met; monitor	89%	YES	
f- solve tech problems	3a,c	CET 160	PSX;xx	39%	no	see course listings	79%	YES	
f- solve tech problems	4c	CET 204	xx	na	na	not taught, baseline	73%	YES	
f- solve tech problems		CET 210	xx		na	not taught, baseline	86%	YES	
f- solve tech problems		CET 260	xx	61%	YES	goal met; monitor	55%	no	UNDER GOAL
f- solve tech problems		CET 267	xx	79%	YES	goal met; monitor	90%	YES	
f- solve tech problems		CET 307	xx		na	not taught, baseline	89%	YES	
f- solve tech problems		CET 312	xx		na	not taught, baseline	na	na	
f- solve tech problems		CET 350	xx		na	not taught, baseline	92%	YES	
f- solve tech problems		CET 452	TX,FX		na	not taught, baseline	81%	YES	
f- solve tech problems		CNT 110	PSX		na	not taught, baseline	73%	YES	
f- solve tech problems		CNT 280	FX	79%	YES	goal met; monitor	45%	no	UNDER GOAL
f- solve tech problems		CNT 330	xx		na	not taught, baseline	100%	YES	
f- solve tech problems		CNT 341			na	not taught, baseline	na	na	
f- solve tech problems		CNT 470			na	not taught, baseline	na	na	
f- solve tech problems		CNT 494	CA,IBJ,PSH,FX	50%	no	see course listings	na	na	
				63%	**YES**	for this ABETobj.;	**76%**	**YES**	**ave still meets goal**
g-Communicate Effectivly	1a,c	ART 210	GPJ		na	not taught, baseline	60%	YES	
g-Communicate Effectivly		ART 284	OP	58%	no	see course listings	78%	YES	better instructions with THE assigment
g-Communicate Effectivly		CET 104	xx	67%	YES	goal met; monitor	89%	YES	
g-Communicate Effectivly		CET 231	FX	75%	YES	goal met; monitor	na	na	
g-Communicate Effectivly		CET 260	PSH;xx	74%	YES	goal met; monitor	55%	no	UNDER GOAL
g-Communicate Effectivly		CET 267	FX;xx	79%	YES	goal met; monitor	90%	YES	
g-Communicate Effectivly		CET 275	PSX		na	not taught, baseline	42%	no	UNDER GOAL
g-Communicate Effectivly		CET 312			na	not taught, baseline	na	na	
g-Communicate Effectivly		CNT 105	TX;CA,FX	78%	YES	goal met; monitor	82%	YES	
g-Communicate Effectivly		CNT 110			na	not taught, baseline	73%	YES	
g-Communicate Effectivly		CNT 330	xx		na	not taught, baseline	100%	YES	
g-Communicate Effectivly		CNT 347	xx		na	not taught, baseline	100%	YES	

CNT BS (Constr/art) Degree, sp02vs fa02

Measurable outcomes (desired behaviors)	Assoc. PUL's	Methods used to access the desired behaviors		What are the assessment findings? Baseline of SPRING 02		What improvements (and changes) have you made based on assessment findings?	What are the assessment findings? Current findings of FALL 02		Impact of changes that were put in place
TAC-ABET,	Related PUL's	COURSE WHERE TAUGHT course numbers; ART=Arch; CET=Civil; CNT=Constr	WORK ITEM TYPE: CA=Computer assmt;FX=Final Exam; GPJ=Group proj.; IPJ=Indiv Proj;IR=Internship Report;J=Journal;LG=Lab Group;LR=Lab Report;OP=Oral Pres.;P=Portfolio; PJB=Project Board;PSH=prob. Solv Homework;PSQ=PrSol. Quizz; PSX=Pr Solv Exam xx=course grade	Percentage of students from class that met the goal (of 60%)	Dd each course meet the goal?	What improvements (and changes) have you made based on assessment findings?	Percentage of students from class that met the goal (of 60%)	Did each course meet the goal?	
g-Communicate Effectivly		CNT 390	internship not graded		na	not taught, baseline	na	na	
g-Communicate Effectivly		CNT 470		na	na	goal met; monitor	na	na	
g-Communicate Effectivly		CNT 494	CA,IBJ,PSH,FX	50%	no	see course listings	na	na	UNDER GOAL
				69%	**YES**	for this ABETobj.;	**77%**	**YES**	**ave still meets goal**
h-Pursue Lifelong Learning	6b	CNT 105	TH	81%	YES	goal met; monitor	90%	YES	
h-Pursue Lifelong Learning		CNT 447		na	na	NO DATA	na	na	
				81%	**YES**	for this ABETobj.;	**90%**	**YES**	**ave still meets goal**
i- society Responsibilities	3a,b	ART 210	GPJ	73%	YES	goal met; monitor	60%	YES	
i- society Responsibilities	5c; 6a	CNT 447		na	na	NO DATA	na	na	
				73%	**YES**	for this ABETobj.;	**60%**	**YES**	**ave still meets goal**
j- society issues & diversity	2e;4c;	CNT 105	TH	78%	YES	goal met; monitor	95%	YES	
	5a,b,c			**78%**	**YES**	for this ABETobj.;	**95%**	**YES**	**ave still meets goal**
k- Qual, Timeliness, Imprmnt	1e;2d,e	ART 120	IPJ	83%	YES	goal met; monitor	91%	YES	
k- Qual, Timeliness, Imprmnt	3b,c	ART 120	xx		na	not taught, baseline	100%	YES	
k- Qual, Timeliness, Imprmnt	4c	ART 155	IPJ	86%	YES	goal met; monitor	88%	YES	
k- Qual, Timeliness, Imprmnt	6a	ART 155	xx		na	not taught, baseline	100%	YES	
k- Qual, Timeliness, Imprmnt		CET 104	xx	67%	YES	goal met; monitor	89%	YES	
k- Qual, Timeliness, Imprmnt		CET 260	PSH;xx	74%	YES	goal met; monitor	55%	no	UNDER GOAL
k- Qual, Timeliness, Imprmnt		CET 267	FX;xx	79%	YES	goal met; monitor	90%	YES	
k- Qual, Timeliness, Imprmnt		CET 350			na	not taught, baseline	92%	YES	
k- Qual, Timeliness, Imprmnt		CNT 330	xx		na	not taught, baseline	100%	YES	
k- Qual, Timeliness, Imprmnt		CNT 341			na	not taught, baseline	na	na	
k- Qual, Timeliness, Imprmnt		CNT 342	PSH		na	not taught, baseline	44%	no	UNDER GOAL
						not taught, baseline			
				78%	**YES**	for this ABETobj.;	**85%**	**YES**	**ave still meets goal**
				overall	**YES**		**overall**	**YES**	**CNT BACH DEGREE**

CNT BS (Constr/art) Degree, sp02vs fa02

COURSE WHERE TAUGHT course numbers; ART=Arch; CET=Civil; CNT=Constr	Spring 02 changes listed by instructor	Fall 02 listed by instructor changes
ART 117	create additional 3D shapes for demo; add colors, firm deadlines	nothing listed on checklist
ART 120	incorporate writing into turn in sheets	add critical thinking exercise
ART 155	provide a small scaled model to help students understand it	
ART 165		continue with more field trips (two this semester)
ART 210		improve grading rubric
ART 222	nothing listed on checklist	nothing listed on checklist
ART 284		change rubric to be more about actual experience and less on presentation
ART 285		
CET 104	fine tune lab experiences	
CET 160	nothing listed on checklist	
CET 204		
CET 210	divide paper into two parts, edit slides to reduce number	
CET 231		
CET 260	include semester project	
CET 267	issue a course workbook to students developed by prof.	
CET 275		use specialized software packages in class
CET 307		
CET 312		
CET 350		
CET 452	devise a team work-group project, research for better text	consider stop/start comments and course objectives survey
CNT 105		more reports on specific topics, more detailed rubric,
CNT 110	put more of tests online for student review for test	more required homework, more problem review in class, vocab online
CNT 280	more teaching on spreadsheets	nothing listed on checklist
CNT 330		
CNT 341		
CNT 342		students had dificulties with Timberline, consider other software ie Win Est
CNT 347		include computer software programs, more in class practical assmts
CNT 390		
CNT 447	incorporate oncourse into curriculum	
CNT 470		
CNT 494	more use of oncourse; mid semester evals; check prereqs; business	calculator

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING 2003 ANNUAL REPORT
Prepared by Charles Yokomoto, Brian King, and the Faculty of the ECE Department
May 19, 2003

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place or planned	9. 2003 assessment findings	10. 2003 Impact of changes and further changes needed
a1. The ability to use mathematics and engineering science (EC2000* Outcome a) This part of ABET Criterion 3, Outcome a, is interpreted to mean the application of mathematics and engineering science. The applied aspects of engineering are assessed in outcomes b, c, and k. *EC2000 refers to the current Accreditation Board for Engineering and Technology (ABET) accreditation criteria for engineering programs.	1d, 2a, b, d, e 3a, b, c 4a, b	a1(1) The ability to solve engineering science problems that require depth on knowledge in the major. a1(2) The ability to solve engineering science problems that require knowledge of mathematics.	ECE201, 202, 264, 266, 301, 302, 311, 382, 365, 369, 444. In addition to the mathematics that they use in their engineering courses, ECE majors are required to take MATH 163, 164, 261, and 262.	The ECE classes generally use lectures, problem solving homework, and problem solving discussion. The MATH courses are traditional large lecture classes.	ECE students' ability to use mathematics and engineering science is assessed in ECE305, 382, and 444. In the future, ECE 305 will be replace by ECE 311, and ECE 444 will be upgraded with a laboratory to become ECE 440.	a1(1) From ECE492, Spring 2002: 78% of the class scored 3.0 or better out of 4.0 (goal: 70%) From ECE444: Solving problems that require mathematics and engineering science-- students averaged 46% (desired average = 58%) –(goal not met) From ECE444: Ability to solve problems that require depth of knowledge—1 of three ECE problems solved successfully (goal not met) From ECE444: Problems that require comprehension of text—one of three ECE problems solved successfully (goal not met.	ECE492: no changes needed. ECE 444 is one of the most difficult of our senior courses. Thus it is not surprising that our goals were not met on all three measures. The Curriculum Committee will be asked to discuss this and related problems.	From ECE 492, The class average was 3.5 out of 4.0 (goal = 3.0), and 100 % of the class scored 3.0 or better (goal: 70%). ECE444, now called ECE440, will be assessed in Fall 2003.	ECE492: Performance remained acceptable. ECE440: The impact of changes on ECE 440 performance will be determine in Fall 2003.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
a2. The ability to use science in engineering (EC2000 Outcome a). This part of ABET Criterion 3, Outcome a, is interpreted to mean the application of science principles taught in our engineering courses. The two most likely candidates are ECE 305 (elective) and ECE 311 (required).	1d, 2a, b, d, e 3a, b, c 4a, b	Level 1: The ability to recall memorized information at a basic level. Level 2: The ability to recall routine knowledge of definitions, principles, or laws, possibly without true understanding Level 3: The ability to use basic definitions, principles, or laws, requiring an understanding rather than rote recall Level 4: The ability to apply reasoning that integrates knowledge of different kinds to come up with the correct response	Through 2001-02, ECE 305 will be used to assess the ability to use science in engineering. Until the current academic year, ECE 305 was required. Now, ECE 305 is an elective, and ECE 311 is required. In addition, ECE majors are required to take Phys 152 and Phys 251.	Both courses are taught in a conventional lecture format where the instructor gives lectures on the topics. Students solve homework problems and take written tests which contain content knowledge questions and problem solving.	Student final exams in ECE 305 were assessed. Two types were written. One type assessed students' general knowledge of the science principles through multiple-choice questions. The other type assessed problem solving.	From ECE305: The final exam contained 12 multiple choice and short answer questions that tested student ability to apply knowledge of science (physics of semiconductor materials) to the design and analysis of semiconductor devices. The class average bettered the instructors target on eight of the 12 questions.	No improvements are necessary.	This course will be assessed again in Fall 2003.	Nothing new to report at this time.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes/Changes needed
b1. The ability to design and conduct experiments (EC2000 Outcome b)	2a, b, c, d 3b 4a, b, c	ECE students are required to take ECE207, 208, 267, 301, 362, 492	ECE207, 208, and 267 provide laboratory experiments for lecture classes ECE201, 255, and 266, respectively. ECE362 is a lecture/laboratory course, ECE492 is a capstone design course, and ECE301 is an engineering science course where students cover material on designing and conducting experiments.	This general outcome is assessed in ECE492, the senior capstone design course. This is assessed as part of the grading of the project through an evaluation of the final report and the oral presentation. This outcome is assessed in ECE492, the capstone design course.	Lab reports in ECE 207, 208, 267, and 362. Problem solving in ECE 301, 362. Capstone design project in ECE 492.	From ECE 492: Students were assessed on their ability to test a design to determine its functionality. The class average was 3.2 out of 4.0 (goal = 3.0), and 89% of the class scored at least 3.0 (goal = 70%)	None needed	From ECE492: The class average was 3.3 out of 4.0 (goal = 3.0), and 85% of the class scored at least 3.0 (goal = 70%)	No changes were made and none are planned for the next offering.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
b2. The ability to analyze and interpret data (EC2000 Outcome b)	2a, b, c, d 3b 4a, b, c	Students will be able to interpret output waveforms, output data tables from computer programs and simulators, and input-output data from systems.	ECE students are required to take ECE 207, 208, 266, 267, 301, 302, 311, 440, and 492.	ECE207, 208, and 267 provide laboratory experiences that are linked to lecture courses ECE201, 255, and 266, respectively. ECE266 is an engineering design course, and ECE301, 302, 311, and 440 are engineering science courses.	This general outcome is assessed in ECE492, the senior capstone design course. This is assessed as part of the grading of the project through an evaluation of the final report and the oral presentation. This outcome is assessed in ECE492, the capstone design course.	This outcome was not satisfied. The average score (Fall 2000) was 2.2 out of 4.0 (goal 3.0) and only 30% of the class scored better than 3.0 (goal 60%).	The ECE Curriculum Committee has selected required, prerequisite courses where the analysis and interpretation of data can be emphasized. This includes ECE207, 208, and 267, which are laboratory courses where students make measurements that result in data that can be analyzed and interpreted.	From ECE492: The class average was 3.57 out of 4.0 (goal = 3.0), and 100% of the class scored at least 3.0 (goal = 70%)	No changes were made and none are planned for the next offering.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
c. The ability to design a system, component, or process to meet desired needs (EC2000 Outcome c)	2a, b, c, d, e 3a, b, c 4a, c	Students will be able to c(1) Conduct library and Internet research to initiate the design process. c(2) Conduct the design according to the formal design process taught in the course, including a consideration of alternative approaches. c(3) Identify and formulate the design problem. c(4) Conduct design using design principles. c(5) Apply engineering principles, math, and science in engineering design. c(6) Apply technical knowledge to design.	ECE students are required to take ECE208, 255, 266, 267, 301, 302, 311, 362, 382, 444, 492.	ECE208 and 267 provide laboratory experiences that are linked to lecture courses ECE255 and 266, respectively. ECE266 is an engineering design course, and ECE301, 302, 311, and 440 are engineering science courses. ECE266 and 382 are engineering design courses. ECE362 is a lecture/laboratory course.	This general outcome is assessed in ECE492, the senior capstone design course. This is assessed as part of the grading of the project through an evaluation of the final report and the oral presentation.	From data from the Fall 2000 ECE492 class, c(1) was clearly met (average score = 3.2, goal = 3.0; 67% of the class $\geq$ 3.0, goal = 70%) c(2) was clearly met (average score = 3.0, goal = 3.0; 75% of the class $\geq$ 3.0, goal = 70%) c(3) was not met (average score = 2.78, goal = 3.0; 60% of the class $\geq$ 3.0, goal = 70%) c(4) was met (75% of the class $\geq$ 3.0, goal = 70%). c(5) was met (average score = 3.03, goal = 3.0; 75% of the class $\geq$ 3.0, goal = 70%) c(6) was met (83% of the class $\geq$ 3.0, goal = 70%)	Five of the six Fall 2000 outcomes met desired levels of performance. The one that was not met was c(2), "The ability to identify and formulate the design problem." Subsequent instructors were asked to place mo emphasis on this part of the design project.	From data from the Spring 2003 ECE492 class, c(1) was clearly met (average score = 3.5, goal = 3.0; 100% of the class $\geq$ 3.0, goal = 70%) c(2) was clearly met (average score = 3.57, goal = 3.0; 100% of the class > 3.0, goal = 70%) c(3) was clearly met (average score = 3.71, goal = 3.0; 100% of the class > 3.0, goal = 70%) c(4) was clearly met (average score = 3.36, goal = 3.0; 100% of the class $\geq$ 3.0, goal = 70%) c(5) was met (average score = 3.5, goal = 3.0; 100% of the class $\geq$ 3.0, goal = 70%) c(6) was met (average score = 3.57, goal = 3.0, s83% of the class $\geq$ 3.0, goal = 70%)	All outcomes met desired levels of performance.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2000-2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
d. The ability to work on interdisciplinary teams Note: The ability to work in teams is not explicitly stated in the PULs but is indirectly included in PUL 5c: Operate with civility in a complex social world. Perhaps the ability to work in teams should be given more visibility.	2c 4b, c 5c	Students will demonstrate: d(1) Attendance at group meetings d(2) Contributions to group discussions d(3) Carrying out assignments d(4) Spirit of teamwork d(5) Value to the team.	ECE students are required to take ENGR195, and ECE 401, and 492, all of which use interdisciplinary teams to some degree.	Almost all of the work done in the three courses listed in the previous column require students to work in groups. In ECE492, students receive formal instruction in leadership and teamwork.	Outcomes d(1) through d(5) were assessed in ECE401 using a fairly detailed rubric is used. Students were asked to rate all members of their team on a 4 = excellent, 3 = good, 2 =needs improvement, 1 = little or no contribution scale. General outcome (d) was assessed holistically in ECE 492.	From ECE/ME 401 (Spring 2002) outcomes d(1) through d(5) were assessed, where ECE and ME students worked in mixed teams. Using a holistic measure of teamwork that was based on the difference of the highest and lowest scores of self-rating, students were successful on this teamwork assessment. From ECE 492 (Fall 2002), instructor's evaluation of teamwork through observations shows that this outcome was clearly met (average score over all teams > 3.31 out of 4.0 and more than 87% of the teams scored 3.0 or better.)	No improvements needed at this time.	From ECE401: In Spring 2003, a different method of assessing teamwork was used. All students rated members of their team on all five behaviors. All students were rated at the 3.3 out of 4.0 level or better on outcomes d(1) through d(5). From ECE492: (d) Was met (average score = 3.57, goal = 3.0; 85% of the class $\geq$ 3.0, goal = 70%)	No changes were made; performance was again acceptable.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2000-2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
e. The ability to identify, formulate, and solve engineering problems (EC2000 Outcome e)	1b, d 2a, b, c, d, e 3a, b, c 4a, b, c	e(1) Students will be able to translate a need into a design task identifying the need and formulating it as a design task.	ECE students are required to take ENGR197, and ECE201, 202, 255, 264, 266, 302, 311, 382, 440, and 492. All of these classes use problem solving as a method for learning.	ENGR197, and ECE201, 202, 255, 264, 266, 302, 211, 382, and 440 are traditional lecture type classes where instructors lecture on the subject, students solve homework problems.	This outcome is assessed in ECE 492 holistically in an assessment of the students' ability to identify and formulate the design task that is assigned to them. Although the assessment is holistic, it is based on the instructor's interaction with the design team throughout the semester-long project.	Fall 2002 e(1): scores on the students' ability to identify and formulate the design problem for their capstone design problem was not met (avg = 2.92, goal = 3.0, and 60% of the class $\geq$ 3.0 out of 4.0, goal = 7s0%) This outcome was met in Fall 2001, but not met in Spring 2002.	Instructors will be asked to place more emphasis on this aspect of the design process in ECE 492.	Spring 2003 e(1): Outcome was clearly met, (avg = 3.71, goal = 3.0, and 100% of the class $\geq$ 3.0 out of 4.0, goal = 70%)	Performance on this outcome was improved by instructors paying more attention to this behavior.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
f. An understanding of professional and ethical responsibilities (EC2000 Outcome f)	2a, b 3b, c 4b, c 5a, b, c 6a, b	Ability to: f(1) Describe how an ethics course can help a practicing engineer. f(2) Describe how codes of ethics help an engineer work ethically. f(3) Analyze a behavior using models of right and wrong (ethical bases) f(4) Analyze ethics codes using models of right and wrong (ethical bases) f(5) Describe how group discussions can help with critical thinking. f(6) Discuss ethical issues in the workplace. f(7) Described how knowledge of cultures is needed for ethical behavior	ECE students are required to take ECE 400 and 401.	ECE400 is a seminar course were representatives of local industry are brought in as guest lecturers, describing what engineers do on the job. ECE 401 is a course in professionalism and ethics. The course contents include principles of ethics and applied ethics, workplace ethics, and ethics as a process for resolving dilemmas and deciding right from wrong.	The outcomes were assessed in ECE401 using a variety of rubrics to score assignments and by using an essay final exam.	The scores on the final exam in ECE401 on all outcomes were satisfactory except for f(5), critical thinking in ethical situations, and f(7), the understanding of different cultures.	More time, emphasis, and/or assignments that require critical thinking and understanding of cultures has been programmed into the course. Students will be given additional exercises in applying critical thinking to an ethical situation and on the effect of different cultures on engineering decision making.	In the Fall ’02 semester, performance was acceptable over-all, with a slightly weak performance on f(6) workplace ethics/confidentiality and f(3) models of right actions.	Performance on f(2) critical thinking was acceptable, and performance on f(3) models of right actions made some improvement.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
g1. The ability to communicate effectively orally (EC2000 Outcome g)	1c	We have defined oral presentations as taking place in the workplace. Students are assessed in TCM 360 on the following competencies: g1(1) Introduction g1(2) Content g1(3) Assumptions g1(4) Conclusions g1(5) Organization g1(6) Visuals g1(7) Style/Wording g1(8) Length g1(9) Grammar g1(10) Delivery g1(11) Pace/Volume g1(12) Body Lang. g1(13) Visual Equip g1(14) Q&A time g1(15) Appropriateness g1(16) Overall rating	ENGR 195 ECE401, 492 TCM360	In ENGR195, students receive instructions in the use of Power Point for their team presentations and receive guidelines on what makes a good presentation. In ECE401 and 492, students are given instructions on how to put together a high quality team presentation In TCM 360 students receive two credits of instructions in writing and making oral presentations	In TCM 360, oral presentations were assessed by a team of faculty members who were trained by Dr. Marjoire Hovde. They use a scoring rubric that was developed by Dr. Hovde.	Student performance was satisfactory on all outcomes in the TCM 360 assessment except for Introduction and Conclusions. In ECE 401, students made a major group presentation on an ethical issue. The team grades for the seven groups were 1 A, 5 A-, and 1 B+. We consider this to be successful. In ECE 401, in their individual presentations in the above group presentation, the grades were 9 A, 13 A-, 5 B+, 1 C+, which we consider to be successful.	In TCM 360, more emphasis is being placed on the Introduction and Conclusions sections, including examples of best practices and peer tutoring. Students must be made to realize that these two sections are as important as the main body of the presentation.	This will be assessed Fall 2003	Not available at this time.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
g2. The ability to communicate effective in writing (EC2000 Outcome g)	1a	We have defined writing as workplace writing. Students are assessed on the following competencies: g2(1) Introduction g2(2) Content g2(3) Assumptions g2(4) Conclusions g2(5) Organization g2(6) Visuals g2(7) Style/Wording g2(8) Page Layout g2(9) Length g2(10) Grammar g2(11) Sources g2(12) Appropriateness g2(16) Overall rating	ENGR 195 ECE401, 492 TCM360	In ENGR195, and ECE 401 and 492, students receive instructions in the qualities of good written paper In TCM 360 students receive two credits of instructions in writing and making oral presentations	Assessment of students' written papers was assessed in TCM 360 using a scoring rubric developed by Dr. Marjorie Hovde of the TCM program.	Performance on all outcomes was satisfactory except for g2(2) Content, g2(4) Conclusions. g2(6) Visuals, and g2(11) Sources	Improvements put in place include more emphasis on the four areas of weakness. Written papers may need to be considered for other courses.	This will be assessed during the Fall 2003 semester	Not available at this time.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
h. A broad education necessary to understand the impact of engineering solutions in a global and societal context (EC2000 Outcome h)	3a, b, c 4c 5a, b 6a	Ability to discuss how U.S. technological developments can have an impact on society locally and globally, the latter requiring an understanding of different cultures	ECE 401	There are 2.5 hours in ECE401 on global implications of engineering decisions. Also, throughout the course, reference is constantly made to different cultures and to the responsibility of engineers to society.	h(1). A question on this outcome was written for the ECE 401 final exam. h(2). Students were asked to write a paper that described how two of their general education electives helped them understand the global nature of engineering in particular and business in general.	h(1): This outcome was met successfully on the Fall 2000 essay exam question, with 70% of the class scored 8.0 out of 10.0 or better (goal 70%). On the Spring 2002 exam, performance was better, with a class average of 9.1 out of 10 (goal = 8.0) and 94% of the class scored 8.0 or better (goal = 70%). h(2): 11 A, 10 B, 4 C, 1 D, 1F for an overall average of B+, which we consider to be successful.	None needed at this time.	h(1): From F ’02 ECE401, 89% of the class scored 70% or better (goal 70%) on this outcome with a class average of 8.9 out of 10 (goal 8.0). From Spr ’03, the class average on this outcome was 8.2/10.0 (goal =8.0). Only 65% of the class scored 8.0 or better, but the outcome was considered met because of the 8.2 average. h(2): From Spring ’03, 7 A+, 5 A, 11 A-, 10 B+, 3 B, 3 B-, and 1 C grade on the essays for an average between B+ and A0, which is considered to be successful.	There were no changes made relative to this outcome.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
i. A recognition of the need for and the ability to engage in lifelong learning. (EC2000 Outcome i)	1b, e 2b	i(1): Graduates of the program will report continued education by reporting that they have attained advanced degrees and certificates, have attended workshops. i(2): Students will demonstrate the ability to use the library and the Internet to search for information for their projects.	i(2): ECE 362, 401, 492	i(2): ECE 401 students are given assignments that require them to collect ethics articles from the print media and Internet articles and write an analysis of them. i(2): EE492 students are required to do library and Internet research to find resource materials for their capstone design project.	i(2): ECE 401: Students are assessed on a group homework project that requires them to find print and Internet articles that demonstrate an ethical issue. Also, the groups may use library and Internet searches to find articles that will improve their group presentation (term project.) i(2): ECE 492: Students are assessed on their use of the library and Internet to search for background information for their design projects.	i(1): An alumni survey was conducted by IMIR with the following findings, which we consider successful indications of lifelong learning: i(1): Advanced degrees: 8 of 30 (27%) received advanced degrees in business, law, engineering, dentistry, or medicine. i(1): Certificates rcvd: 9 Workshops and short courses: 17 Journals subscribed: 11 i(2): ECE401--Collecting news articles and interpreting them: 5 groups A, one group C, one group B, which we consider successful demonstration of this aspect of lifelong learning. i(2): ECE492: Students in this course (Fall 2000) clearly met the outcome (average	No improvements are needed at this time.	i(1): This data will be obtained Fall 2003. i((2): From Spring '05, ECE401--Collecting news articles and interpreting them: 2 groups A+, 3 groups A, 3 groups A- which is an improvement over the previous data collection period and again successfully demonstrates this aspect of lifelong learning. i(2): ECE492 from Spring 2003: Students in this course clearly met the outcome (average score = 3.5, > the desired 3.0; 100% of the class above 3.0, > the desired 60%)	

						score = 3.2, > the desired 3.0; 67% of the class above 3.0, > the desired 60%)			

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
j. A knowledge of contemporary issues (EC2000 Outcome j)	1b 2e 4b 5 b 6b	j(1); Students are able to describe current issues in the public forum. j(2) Students are able to identify and interpret current ethical issues in the print and Internet media. j(3) Students will be able to write an essay on the final exam on the importance of knowledge of current events to a professional engineer.	ECE 401	Students are given an assignment in ECE (five weeks) where they must find news articles and magazine articles in the print media and on the Internet that describe current ethical issues	j(1) is assessed through a brainstorming group quiz where groups must write down as many current issues as they can. Issues do not have to be related to ethics. j(2) is assessed by grading the quality of the ethical issues submitted by students on the assignment that requires them to find articles that describe ethical issues. j(3) is assessed on the final essay exam.	j(1): The groups averaged 8.7 current event items, from a low of 5 to a high of 14, on this 10 minute exercise, which we consider successful. j(2): From the Fall 2000 semester--six groups recorded the following group grades—A+, A+, A+. A-, A-, B+, C, which we consider successful. j(3): From the Fall 2000 semester, the class average was 8.5 out of 10 (goal 8.0) and 80% of the class scored 8.0 or better (goal 70%). In the Spring 2002 semester, the class averaged 9.2 out of 10 (goal = 8.0) and 100% scored 8.0 or better (goal = 70%) Both performances are considered to be successful.	None needed at this time.	j(1): This exercise was not done, so there is no comparison data. j(2): PUT THIS IN j(3): From the Fall 2002 semester, the class average was 8.7 out of 10 (goal 8.0) and 80% of the class scored 8.0 or better (goal 70%). In l	All assessed performance was maintained.

1. General outcomes	2. Associated PULs	3. What student will know or be able to do (Measurable outcomes)	4. Where students will learn it	5. How students learn it (in class or out of class)	6. How each of the measurable outcomes is measured	7. 2002 assessment findings	8. Changes put into place (including planned changes)	9. 2003 assessment findings	10. 2003 Impact of changes
k. The ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (EC2000 Outcome k)	1e 3b, c 4a	k(1) Students will be able to use engineering tools successfully in the completion of their senior design project.	ENGR 195, 196, 197 ECE 202, 207, 264, 266, 267, 311, 321, 382	Homework problems in lecture type classes require students to use mathematical tools and software tools. Laboratories require students to use laboratory equipment, mathematical tools, design tools and computer tools. Project courses require students to use mathematical tools, software tools, research tools, and/or design tools.	k(1) is assessed by the instructional team or the course supervisor that grades the senior design project reports. This ability is graded on a scale of 4: excellent 3.: competent 2: satisfactory 1: marginal 0: poor	k(1) On the senior design project, 78% of the student teams demonstrated that they were on a scale from 0 to 4.0)	No improvements needed at this time.	k(1): From Fall '02, on the senior design project, 100% of the student teams demonstrated that they were competent of better ($\geq$ 3.0 on a scale from 0 to 4.0). The class average was 3.57 (goal = 3.0)	Performance improved even though nothing of significance was done to improve performance.

ECET ASSESSMENT OVERVIEW SPRING 2003

The department used multiple techniques to get assessment data. Students were surveyed to determine their satisfaction with the department and to determine if course objectives had been met. Recent graduates were surveyed to determine how well the department prepared them for their jobs. Many data points were also collected from specific class assignments to evaluate specific areas such as communications skills, ability to function effectively on teams, and applying creativity in the design of systems. Few unique courses in the new CpET have been taught so far, so a separate summary was not made for the CpET program; this should be ready for Spring 2004. Some highlights of the assessment effort are listed.

Departmental survey of continuing students. The survey was given to students in classes that included a very limited number of majors outside the department for a second year. The survey addressed students' satisfaction with advising, faculty office hours, computer equipment, laboratory accessibility, course materials used, opportunities to get to know other ECET students and the faculty and overall satisfaction with the department. The results were quite good with significant improvement in numbers that were already quite high. For the overall survey 81.4 percent (up slightly from 78.7 percent in 2002) of respondents strongly agreed or agreed that the ECET department was doing a good job in the areas covered by the survey. 87.1 percent (up from 85.8% in 2002) of students surveyed strongly agreed or agreed that overall they were satisfied with the department. 90.3% of B.S. students indicated they were satisfied and 85.7% of A.S. students indicated they were satisfied with the department (BS: down slightly from 92.6%, AS: up significantly from 78.8%). The greatest improvement was seen in satisfaction with computer equipment 72.3% were satisfied, up from 57.9% in 2002. This number was 54.8% (40.7% in 2002) for B.S. students and 80% (75.5% in 2002) for A.S. students, indicating that there has been some recent improvement. The department survey form and the spreadsheet with the results are attached.

Course Objectives. Course objectives were required for all courses and student surveys were administered to determine if the objectives were met. These objectives were then classified into ABET a-k criteria to see where and how well the department was meeting the a-k criteria. Course objective are action oriented and students were asked if they could perform the task covered by the objective. Results in the A.S. and B.S. degree programs indicate the percentage of students who strongly agree or agree they can perform the function indicated by the course objective. This exercise very clearly brings out areas where a department may be weak in the sense that very few course objective address the ABET criterion. Very few course objectives related to ABET items i, j, and k. An overwhelming number of course objectives related to criteria a (mastery). This was somewhat expected since the primary goal of a technological department such as the ECET department is mastery of the skill set, but the department needs to make sure that it is graduating well-rounded students by intentionally addressing some of the softer ABET objectives. Course content in these areas needs to be beefed up, and plans are underway to address and assess these areas.

The results from the student surveys are good. In most of the ABET criterion areas, over 80% of students strongly agreed or agreed they could perform course objectives. Specific results for ABET a-k are included in the A.S. and B.S. program summaries. The spreadsheet results are also attached. Specific plans are under development to have faculty evaluate how well they believe students can perform the various course objectives.

Other Assessment Techniques. In addition to evaluating course objectives, the department used specified course assignments, laboratory assignments, class projects, course papers, student presentations in courses, and selected examination questions or course presentations to assess the various ABET a-k criteria. The department's capstone senior design courses were heavily assessed for both technical and communications skills. The results from these other assessment techniques are included in the A.S. and B.S. summary reports.

Departmental survey of recent graduates. Eighty-six percent of graduates surveyed approximately 6 months after graduation in 2002 indicated that the ECET department has done a good or excellent job of preparing them for their current assignment. A similar survey in 2003 showed one hundred percent of recent graduates agreed.

Biomedical Electronics Technology Associate Degree Program. The blend of medicine and electronics results in a varied curriculum encompassing a wide range of materials. Surveys of students have indicated strengths and weaknesses in the curriculum. It appears that students indicate that they are able to solve technical problems and are proficient with the medical knowledge necessary to function in the health care environment. Some areas of weakness may include are exploration of medical ethics and the need for respect for various cultures within the hospital environment. The unique and stressful pace of health care requires a particular decorum and accountability. More attention will be placed on some of these skills in the future.

It should be noted that the BMET A.S. degree is not ABET accredited and most likely will not be in the future. Employers see no benefit to this distinction as well as virtually all BMET programs nationally have not pursued this accreditation level.

Students are encouraged to participate in the national certification exam provided by Association for the Advancement of Medical Instrumentation. Certified BMETs are highly sought after and it is this ultimate assessment tool which is useful to this program.

Summary

The ECET Assessment Summary of the A.S. Degree Program – Spring 2003 and the ECET Assessment Summary of the B.S. Degree Program – Spring 2003 portray the status of the ECET degree programs. The status of the programs is strong and viable. Weaknesses that were recognized a few years earlier, such as computer support, have been addressed and greatly improved. The department is revising the overall assessment plan to specify exactly which data is to be collected in each course. Further assessment

may be conducted from the employers' and graduates' viewpoints by continuing the survey work that was conducted in the 2000 year. These and other inputs are continually being used as part of the department's Continuous Improvement Program.

June 17, 2003
ECET Department

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	**2. What the student will know or be able to do? (measurable outcomes)**	**3. How will you help students learn it (in class or out of class)**	**4. Where will your students learn it?**	**5. How each of the measurable outcomes is measured**	**6. 2002 assessment findings**	**7. Changes planned/put into place**	**8. 2003 assessment findings**	**9. Impact / further change needed**
ABET Criterion 1, item a; Demonstrate an appropriate mastery of the knowledge, techniques, skills and modern tools of their discipline.	There are sets of generally accepted skills that are used in the discipline such as circuit analysis and design, analog and digital design, and programming.	Laboratories are a strong component of this learning objective. In addition normal classroom activities such as lectures, homework, and group learning activities.	Mastery of a skill set is a primary objective of the departments teaching mission and all courses in this curriculum have this as a primary focus.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. There were 153 course objectives identified with this criterion. The third exam in EET205 the terminal course in the digital sequence was analyzed to determine mastery.	The department is strong in this outcome with many relevant course objectives and 86.8 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives. In EET205 61% of the students made a 70% or higher on the third exam.	Courses are assessed at the end of each semester for continuous improvement.	The department is still strong in this outcome with 84.6% percent of students indicating that they strongly agree or agree that they can perform tasks indicated by the course objectives. In EET205 75% of the students made a 70% or higher on the third exam – a significant improvement.	The department will identify a set of standard questions from final exams from three required courses in each AS program & track student scores on these problems in addition to the student self-assessment.

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	**2. What the student will know or be able to do? (measurable outcomes)**	**3. How will you help students learn it (in class or out of class)**	**4. Where will your students learn it?**	**5. How each of the measurable outcomes is measured**	**6. 2002 assessment findings**	**7. Changes planned/put into place**	**8. 2003 assessment findings**	**9. Impact / further change needed**
ABET Criterion 1, item b; Apply current knowledge and adapt to emerging applications in mathematics, science, engineering and technology.	This is determined by a student's ability to synthesize information and arrive at reasoned conclusions.	Laboratories are a strong component of the learning. In addition normal classroom activities such as lectures, homework, and group learning activities.	EET105, EET155, EET234, and EET302 have course objectives relevant to this criterion.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. Altogether thirteen course objectives from courses taught in the spring 2002 semester related to this course objective, and 25 objectives in Spring 2003.	88.5 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives.	Courses are assessed at the end of each semester for continuous improvement. Specific assessment of items in this topic showed the department to be strong in this area, and no specific changes were implemented due to assessment data.	The department remains strong in this area with 87.5 percent of students indicating they strongly agree or agree they can perform tasks in this area.	The department will identify a set of standard questions from final exams from three required courses in each AS program & track student scores on these problems in addition to the student self-assessment.

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	**2. What the student will know or be able to do? (measurable outcomes)**	**3. How will you help students learn it (in class or out of class)**	**4. Where will your students learn it?**	**5. How each of the measurable outcomes is measured**	**6. 2002 assessment findings**	**7. Changes planned/put into place**	**8. 2003 assessment findings**	**9. Impact / further change needed**
ABET Criterion 1, item c; Conduct, analyze and interpret experiments and apply experimental results to improve processes.	Students ability to conduct experiments and properly measure outputs and form proper conclusions based on the outputs.	Laboratories are a strong component of this learning objective. All EET courses include a laboratory component.	Students will learn this objective in all AS courses, since they are all include a laboratory component.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. There were 23 course objectives identified with this criterion. Laboratory practicals are given in many courses that require a student to design a circuit or system, construct it, and analyze the results to determine if improvements are needed.	The department is strong in this outcome with many relevant course objectives and 88.0 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives. 85 percent of students scored 70% or higher on the EET205 laboratory practical. This class is the terminal digital course in the A.S. program.	Courses are assessed at the end of each semester for continuous improvement. Specific assessment of items in this topic showed the department to be strong in this area, and no specific changes were implemented due to assessment data.	The department remains strong in this area with 84.9 percent of students indicating they strongly agree or agree they can perform tasks related to this objective. 80 percent of students scored 70% or higher on the EET205 laboratory practical – down slightly, but still good.	The department will identify a set of standard questions from final exams from three required courses in each AS program & track student scores on these problems in addition to the student self-assessment.

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	**2. What the student will know or be able to do? (measurable outcomes)**	**3. How will you help students learn it (in class or out of class)**	**4. Where will your students learn it?**	**5. How each of the measurable outcomes is measured**	**6. 2002 assessment findings**	**7. Changes planned/put into place**	**8. 2003 assessment findings**	**9. Impact / further change needed**
ABET Criterion 1, item d; Apply creativity in the design of systems, components or processes appropriate to program objectives.	Students should be able to design a system by creatively applying fundamental skills learned in the curriculum.	Some laboratory assignments and projects require a creative approach such as the course projects in EET114 EET155, EET154, EET204 and EET205 as well as 80% of the laboratories in EET302.	EET105, EET114, EET155, EET204, EET205, EET234, and EET302 have course objectives that have a creative component.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. There were 39 course objectives identified with this criterion. We also assigned a special problem in EET205 and EET204 that required a creative solution. Answers to a design question from a terminal analog course, EET204, were analyzed to determine creativity.	The department is strong is this outcome with many relevant course objectives and 93.9 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives.	EET 105 and EET 155 added lecture material discussing the design process to introduce the engineering design process and stress the creativity involved.	The student self evaluations showed that 89 percent strongly agreed or agreed that they could perform tasks related to this objective. Data from 204 & 205 was not collected for 2003.	The department will identify a set of standard questions from final exams from three required courses in each AS program & track student scores on these problems in addition to the student self-assessment.

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item e; Function effectively on teams.	Team performance was evaluated in EET 205.	Laboratories are a strong component of this learning objective. In addition normal classroom activities such as lectures, homework, and group learning activities.	Students work in small groups in most of our laboratories and learn practical group skills. In addition, courses taught in spring 2002 have 9 course objectives related to group activities. Courses EET155, EET234 and EET205 have group projects.	A self-assessment was completed by students and the instructor teaching EET 205. This course was used to evaluate group activity since it is one of the last courses taken for the A.S. degree. Course objectives were evaluated by students.	The finding from EET 205 indicate that group scores were acceptable. 75 percent of the group members thought there group was effective and 82 percent felt the group communicated well. One problem area was participation in that only 68 percent of group members felt all members contributed to the project. 93.0 percent of the students strongly agree or agree that they can perform tasks indicated by the course objectives.	We plan to have students write down the qualifications for a good lab partner in EET102 and EET154 and then use this data as a teaching tool. Lab partners will be evaluated based on this criteria. Additional student training at the team level was required: team training was introduced in EET 155. Assessment rubrics for self- and peer-evaluation will be developed and validated by OLS and used in 209 (self) and 159 (peer)	The percentage of students who strongly agree or agree that they can perform tasks indicated by the course objectives dropped to 83.2 percent. This can be attributed to a high number of "undecided" choices on one question in EET 205, which was too complex to measure this outcome. "Work effectively in teams to break a complex project into software modules, plan some modules and implement them" Without this question, the percentage improves to 92.1%	A self-assessment rubric will be used in EET 205, and a formal self & peer assessment rubric will be used in EET 155. The EET 205 assessment survey will be modified for clarity.

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item f; Identify, analyze and solve technical problems.	There are sets of generally accepted problem types used in the discipline.	A large portion of normal classroom activities such as lecture and homework are devoted to teaching this objective. Laboratories also play a strong role in teaching related to this learning objective.	Mastery of discipline related problem solving is primary objective of the departments teaching mission and all courses in this curriculum have this as a primary focus.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. There were 75 course objectives identified with this criterion. Answers to a selected problem from a terminal analog course, EET204, were analyzed to determine problem solving skills. The power supply project in EET 154 was evaluated by the instructor to determine how well students could solve the problems involved in getting a power supply to work.	The department is strong is this outcome with many relevant course objectives and 86.3 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives. The results from the selected EET 204 problem indicate a 4 out of a possible 5 for problem solving. Results from EET154 indicate that 23 out of 26 students were successful, an 88% success rate.	EET 105 and EET 155 added lecture material discussing the design process to introduce the engineering design process and stress the creativity involved.	The department has many course outcomes in this area: 81.7% of students strongly agree or agree that they can accomplish tasks in this area. Again, data shows the majority of the remainder chose “undecided” in one particular course (EET 205).	The department will identify a set of standard questions from final exams from three required courses in each AS program & track student scores on these problems in addition to the student self-assessment. The assessment survey for EET 205 will be reviewed for clarity.

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	**2. What the student will know or be able to do? (measurable outcomes)**	**3. How will you help students learn it (in class or out of class)**	**4. Where will your students learn it?**	**5. How each of the measurable outcomes is measured**	**6. 2002 assessment findings**	**7. Changes planned/put into place**	**8. 2003 assessment findings**	**9. Impact / further change needed**
ABET Criterion 1, item g; Communicate effectively.	We evaluated based on communications skills that are expected by industry of recent AS graduates.	Students are required to write papers that are returned for corrections. Oral presentations are critiqued. ENGW131 and COMM R110 are required courses in the curriculum.	Students take the required English composition and speech courses. In addition, papers are required in EET154 and EET204. Seventeen course objectives from courses taught in spring were related to communications. Nearly all laboratories require written reports.	Oral presentations were evaluated in EET302 and writing skills were evaluated in EET204.	Written communications specifically evaluated in EET204 were ranked at a 4 on a scale of 5 (best). Oral presentations evaluated in EET302 indicate that 90% of students made presentations that the instructor felt would be acceptable for a recent A.S. graduate.	Additional instructions on written and oral presentations were introduced in lecture and on the Internet for students in EET 155.	87.8 percent of students surveyed strongly agreed or agreed they could do tasks in these areas. EET 155 peer evaluations had an average evaluation of 93%, and written reports (final formal reports) evaluation of 95.6%. Evaluations in EET204 indicate that 90% of students made written & oral presentations that the instructor felt would be acceptable for a recent A.S. graduate.	The department will explore "calibrated peer evaluation of writing assignments" on the Internet. The department will also identify specific written & oral requirements & use a standard assessment rubric to better measure improvement.

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	**2. What the student will know or be able to do? (measurable outcomes)**	**3. How will you help students learn it (in class or out of class)**	**4. Where will your students learn it?**	**5. How each of the measurable outcomes is measured**	**6. 2002 assessment findings**	**7. Changes planned/put into place**	**8. 2003 assessment findings**	**9. Impact / further change needed**
ABET Criterion 1, item h; Recognize the need for and possess the ability to pursue lifelong learning.	Evaluate student's ability to investigate an unfamiliar topic outside of class using global research tools.	Provide guidance to direct students to appropriate research tools.	EET103 and EET234.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. There were two course objectives identified with this criterion.	The department is strong is this outcome with many relevant course objectives and 86.8 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives.	The completeness of the research and dependability of the sources will be assessed through a project in 164. EET 234 students will conduct a research project using outside recourses.	90.9 percent of students indicated they strongly agree or agree that they can perform tasks indicated by course objectives.	A rubric will be developed for peer assessment of the validity of sources (including Internet URL's).

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	**2. What the student will know or be able to do? (measurable outcomes)**	**3. How will you help students learn it (in class or out of class)**	**4. Where will your students learn it?**	**5. How each of the measurable outcomes is measured**	**6. 2002 assessment findings**	**7. Changes planned/put into place**	**8. 2003 assessment findings**	**9. Impact / further change needed**
ABET Criterion 1, item i; Understand professional, ethical and societal responsibilities.	Evaluation of course objectives and review prive/ Performance ratios from student designs.	Ethical case studies related to safety are presented in the classroom. Teach design tradeoffs based on costs.	EET 154 and EET212.	Student self-assessment of their comprehension of this course objective was measured for EET212 during the spring semester.	71.4 percent of students indicating they strongly agree or agree that they understand ethical issues related to safety.	EET 103 and EET 109 students will be introduced to the importance of these issues in the workplace. EET 103 and EET 105 course information refers students to the “Code of Conduct” pages on the Internet;	80% of students surveyed indicated that they strongly agree or agree that tasks associated with these objectives can be accomplished.	The department is developing a “faculty survey of student behavior” using the Code of Conduct and Civility Statement.

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	**2. What the student will know or be able to do? (measurable outcomes)**	**3. How will you help students learn it (in class or out of class)**	**4. Where will your students learn it?**	**5. How each of the measurable outcomes is measured**	**6. 2002 assessment findings**	**7. Changes planned/put into place**	**8. 2003 assessment findings**	**9. Impact / further change needed**
ABET Criterion 1, item j; Recognize contemporary professional, societal and global issues and be aware of and respect diversity.	Respect diversity: Increased awareness of personality types and individual differences.	Students are taught to identify their own personality types based on standard scales such as Meyers-Briggs.	EET103	Classroom lecture accompanied by on-line assessments.	Evaluating classroom discussion regarding identified types and ramifications of that type. 95.7 percent of class strongly agreed or agreed that they could identify and define fundamental personality types.	EET 103 and EET 105 course information refers students to the "Code of Conduct" pages on the Internet; The department is developing a "faculty survey of student behavior" using the Code of Conduct and Civility Statement.	91.5 percent of students surveyed indicated that they strongly agree or agree that tasks in course objectives in this are can be completed.	The department is developing a "faculty survey of student behavior" using the Code of Conduct and Civility Statement.

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	**2. What the student will know or be able to do? (measurable outcomes)**	**3. How will you help students learn it (in class or out of class)**	**4. Where will your students learn it?**	**5. How each of the measurable outcomes is measured**	**6. 2002 assessment findings**	**7. Changes planned/put into place**	**8. 2003 assessment findings**	**9. Impact / further change needed**
ABET Criterion 1, item k; Have a commitment to quality, timeliness and continuous improvement.	Timeliness outcomes measured and a rubric for quality will be generated.	Enforcing strict project deadlines and explain the quality rubric.	EET 109, EET 157 & EET 284	Fill in rubric.	Not measured for Spring 2002. This will be measured in the future.	Two course objectives were identified in this area (EET 284)	91.5 percent of students surveyed indicated that they strongly agree or agree that tasks in course objectives in this are can be completed.	A rubric will be developed in EET 154 to measure timeliness. The department plan includes identifying two assignments in two different courses (109 & 284) for which timeliness will be recorded. Students will *not* be notified which assignments are used to collect this data

ECET Assessment Summary of the A.S. Degree Program – Spring 2003

1. General outcomes:	**2. What the student will know or be able to do? (measurable outcomes)**	**3. How will you help students learn it (in class or out of class)**	**4. Where will your students learn it?**	**5. How each of the measurable outcomes is measured**	**6. 2002 assessment findings**	**7. Changes planned/put into place**	**8. 2003 assessment findings**	**9. Impact / further change needed**
ABET Criterion 1, item a; Demonstrate an appropriate mastery of the knowledge, techniques, skills and modern tools of their discipline.	There are sets of generally accepted skills that are used in the discipline such as circuit analysis and design, analog and digital design, and programming.	Laboratories are a strong component of this learning objective. In addition normal classroom activities such as lectures, homework, and group learning activities.	Mastery of a skill set is a primary objective of the departments teaching mission and all courses in this curriculum have this as a primary focus.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. There were 153 course objectives identified with this criterion. The third exam in EET205 the terminal course in the digital sequence was analyzed to determine mastery.	The department is strong in this outcome with many relevant course objectives and 86.8 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives. In EET205 61% of the students made a 70% or higher on the third exam.	Courses are assessed at the end of each semester for continuous improvement.	The department is still strong in this outcome with 84.6% percent of students indicating that they strongly agree or agree that they can perform tasks indicated by the course objectives. In EET205 75% of the students made a 70% or higher on the third exam – a significant improvement.	The department will identify a set of standard questions from final exams from three required courses in each AS program & track student scores on these problems in addition to the student self-assessment.

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item b; Apply current knowledge and adapt to emerging applications in mathematics, science, engineering and technology.	This is determined by a student's ability to synthesize information and arrive at reasoned conclusions.	Laboratories are a strong component of the learning. In addition normal classroom activities such as lectures, homework, and group learning activities.	EET105, EET155, EET234, and EET302 have course objectives relevant to this criterion.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. Altogether thirteen course objectives from courses taught in the spring 2002 semester related to this course objective, and 25 objectives in Spring 2003.	88.5 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives.	Courses are assessed at the end of each semester for continuous improvement. Specific assessment of items in this topic showed the department to be strong in this area, and no specific changes were implemented due to assessment data.	The department remains strong in this area with 87.5 percent of students indicating they strongly agree or agree they can perform tasks in this area.	The department will identify a set of standard questions from final exams from three required courses in each AS program & track student scores on these problems in addition to the student self-assessment.

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item c; Conduct, analyze and interpret experiments and apply experimental results to improve processes.	Students ability to conduct experiments and properly measure outputs and form proper conclusions based on the outputs.	Laboratories are a strong component of this learning objective. All EET courses include a laboratory component.	Students will learn this objective in all AS courses, since they are all include a laboratory component.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. There were 23 course objectives identified with this criterion. Laboratory practicals are given in many courses that require a student to design a circuit or system, construct it, and analyze the results to determine if improvements are needed.	The department is strong in this outcome with many relevant course objectives and 88.0 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives. 85 percent of students scored 70% or higher on the EET205 laboratory practical. This class is the terminal digital course in the A.S. program.	Courses are assessed at the end of each semester for continuous improvement. Specific assessment of items in this topic showed the department to be strong in this area, and no specific changes were implemented due to assessment data.	The department remains strong in this area with 84.9 percent of students indicating they strongly agree or agree they can perform tasks related to this objective. 80 percent of students scored 70% or higher on the EET205 laboratory practical – down slightly, but still good.	The department will identify a set of standard questions from final exams from three required courses in each AS program & track student scores on these problems in addition to the student self-assessment.

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item d; Apply creativity in the design of systems, components or processes appropriate to program objectives.	Students should be able to design a system by creatively applying fundamental skills learned in the curriculum.	Some laboratory assignments and projects require a creative approach such as the course projects in EET114 EET155, EET154, EET204 and EET205 as well as 80% of the laboratories in EET302.	EET105, EET114, EET155, EET204, EET205, EET234, and EET302 have course objectives that have a creative component.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. There were 39 course objectives identified with this criterion. We also assigned a special problem in EET205 and EET204 that required a creative solution. Answers to a design question from a terminal analog course, EET204, were analyzed to determine creativity.	The department is strong is this outcome with many relevant course objectives and 93.9 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives.	EET 105 and EET 155 added lecture material discussing the design process to introduce the engineering design process and stress the creativity involved.	The student self evaluations showed that 89 percent strongly agreed or agreed that they could perform tasks related to this objective. Data from 204 & 205 was not collected for 2003.	The department will identify a set of standard questions from final exams from three required courses in each AS program & track student scores on these problems in addition to the student self-assessment.

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item e; Function effectively on teams.	Team performance was evaluated in EET 205.	Laboratories are a strong component of this learning objective. In addition normal classroom activities such as lectures, homework, and group learning activities.	Students work in small groups in most of our laboratories and learn practical group skills. In addition, courses taught in spring 2002 have 9 course objectives related to group activities. Courses EET155, EET234 and EET205 have group projects.	A self-assessment was completed by students and the instructor teaching EET 205. This course was used to evaluate group activity since it is one of the last courses taken for the A.S. degree. Course objectives were evaluated by students.	The finding from EET 205 indicate that group scores were acceptable. 75 percent of the group members thought there group was effective and 82 percent felt the group communicated well. One problem area was participation in that only 68 percent of group members felt all members contributed to the project. 93.0 percent of the students strongly agree or agree that they can perform tasks indicated by the course objectives.	We plan to have students write down the qualifications for a good lab partner in EET102 and EET154 and then use this data as a teaching tool. Lab partners will be evaluated based on this criteria. Additional student training at the team level was required: team training was introduced in EET 155. Assessment rubrics for self- and peer-evaluation will be developed and validated by OLS and used in 209 (self) and 159 (peer)	The percentage of students who strongly agree or agree that they can perform tasks indicated by the course objectives dropped to 83.2 percent. This can be attributed to a high number of "undecided" choices on one question in EET 205, which was too complex to measure this outcome. "Work effectively in teams to break a complex project into software modules, plan some modules and implement them" Without this question, the percentage improves to 92.1%	A self-assessment rubric will be used in EET 205, and a formal self & peer assessment rubric will be used in EET 155. The EET 205 assessment survey will be modified for clarity.

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item f; Identify, analyze and solve technical problems.	There are sets of generally accepted problem types used in the discipline.	A large portion of normal classroom activities such as lecture and homework are devoted to teaching this objective. Laboratories also play a strong role in teaching related to this learning objective.	Mastery of discipline related problem solving is primary objective of the departments teaching mission and all courses in this curriculum have this as a primary focus.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. There were 75 course objectives identified with this criterion. Answers to a selected problem from a terminal analog course, EET204, were analyzed to determine problem solving skills. The power supply project in EET 154 was evaluated by the instructor to determine how well students could solve the problems involved in getting a power supply to work.	The department is strong is this outcome with many relevant course objectives and 86.3 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives. The results from the selected EET 204 problem indicate a 4 out of a possible 5 for problem solving. Results from EET154 indicate that 23 out of 26 students were successful, an 88% success rate.	EET 105 and EET 155 added lecture material discussing the design process to introduce the engineering design process and stress the creativity involved.	The department has many course outcomes in this area: 81.7% of students strongly agree or agree that they can accomplish tasks in this area. Again, data shows the majority of the remainder chose “undecided” in one particular course (EET 205).	The department will identify a set of standard questions from final exams from three required courses in each AS program & track student scores on these problems in addition to the student self-assessment. The assessment survey for EET 205 will be reviewed for clarity.

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item g; Communicate effectively.	We evaluated based on communications skills that are expected by industry of recent AS graduates.	Students are required to write papers that are returned for corrections. Oral presentations are critiqued. ENGW131 and COMM R110 are required courses in the curriculum.	Students take the required English composition and speech courses. In addition, papers are required in EET154 and EET204. Seventeen course objectives from courses taught in spring were related to communications. Nearly all laboratories require written reports.	Oral presentations were evaluated in EET302 and writing skills were evaluated in EET204.	Written communications specifically evaluated in EET204 were ranked at a 4 on a scale of 5 (best). Oral presentations evaluated in EET302 indicate that 90% of students made presentations that the instructor felt would be acceptable for a recent A.S. graduate.	Additional instructions on written and oral presentations were introduced in lecture and on the Internet for students in EET 155.	87.8 percent of students surveyed strongly agreed or agreed they could do tasks in these areas. EET 155 peer evaluations had an average evaluation of 93%, and written reports (final formal reports) evaluation of 95.6%. Evaluations in EET204 indicate that 90% of students made written & oral presentations that the instructor felt would be acceptable for a recent A.S. graduate.	The department will explore "calibrated peer evaluation of writing assignments" on the Internet. The department will also identify specific written & oral requirements & use a standard assessment rubric to better measure improvement.

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item h; Recognize the need for and possess the ability to pursue lifelong learning.	Evaluate student's ability to investigate an unfamiliar topic outside of class using global research tools.	Provide guidance to direct students to appropriate research tools.	EET103 and EET234.	Student self-assessment of their comprehension of course objectives was measured for courses taught during the spring semester. There were two course objectives identified with this criterion.	The department is strong is this outcome with many relevant course objectives and 86.8 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives.	The completeness of the research and dependability of the sources will be assessed through a project in 164. EET 234 students will conduct a research project using outside recourses.	90.9 percent of students indicated they strongly agree or agree that they can perform tasks indicated by course objectives.	A rubric will be developed for peer assessment of the validity of sources (including Internet URL's).

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item i; Understand professional, ethical and societal responsibilities.	Evaluation of course objectives and review prive/ Performance ratios from student designs.	Ethical case studies related to safety are presented in the classroom. Teach design tradeoffs based on costs.	EET 154 and EET212.	Student self-assessment of their comprehension of this course objective was measured for EET212 during the spring semester.	71.4 percent of students indicating they strongly agree or agree that they understand ethical issues related to safety.	EET 103 and EET 109 students will be introduced to the importance of these issues in the workplace. EET 103 and EET 105 course information refers students to the “Code of Conduct” pages on the Internet;	80% of students surveyed indicated that they strongly agree or agree that tasks associated with these objectives can be accomplished.	The department is developing a “faculty survey of student behavior” using the Code of Conduct and Civility Statement.

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item j; Recognize contemporary professional, societal and global issues and be aware of and respect diversity.	Respect diversity: Increased awareness of personality types and individual differences.	Students are taught to identify their own personality types based on standard scales such as Meyers-Briggs.	EET103	Classroom lecture accompanied by on-line assessments.	Evaluating classroom discussion regarding identified types and ramifications of that type. 95.7 percent of class strongly agreed or agreed that they could identify and define fundamental personality types.	EET 103 and EET 105 course information refers students to the "Code of Conduct" pages on the Internet; The department is developing a "faculty survey of student behavior" using the Code of Conduct and Civility Statement.	91.5 percent of students surveyed indicated that they strongly agree or agree that tasks in course objectives in this are can be completed.	The department is developing a "faculty survey of student behavior" using the Code of Conduct and Civility Statement.

1. General outcomes:	2. What the student will know or be able to do? (measurable outcomes)	3. How will you help students learn it (in class or out of class)	4. Where will your students learn it?	5. How each of the measurable outcomes is measured	6. 2002 assessment findings	7. Changes planned/put into place	8. 2003 assessment findings	9. Impact / further change needed
ABET Criterion 1, item k; Have a commitment to quality, timeliness and continuous improvement.	Timeliness outcomes measured and a rubric for quality will be generated.	Enforcing strict project deadlines and explain the quality rubric.	EET 109, EET 157 & EET 284	Fill in rubric.	Not measured for Spring 2002. This will be measured in the future.	Two course objectives were identified in this area (EET 284)	91.5 percent of students surveyed indicated that they strongly agree or agree that tasks in course objectives in this are can be completed.	A rubric will be developed in EET 154 to measure timeliness. The department plan includes identifying two assignments in two different courses (109 & 284) for which timeliness will be recorded. Students will *not* be notified which assignments are used to collect this data

FRESHMAN ENGINEERING ASSESSMENT NARRATIVE—2003
Prepared by the Faculty of the Freshman Engineering Program
August, 2003

A Survey of Student Satisfaction

A Student Satisfaction Survey was administered to students in ENGR 195, 196 and 197 for the first time in the spring semester, 2003. Results were tabulated and displayed in the tables below as a function of the student academic unit and also as a function of student age. The survey will be administered again in the fall semester, 2003, and in the spring semester, 2004. Results for these semesters will provide additional data for analysis. Many students used the survey to include comments reflecting dissatisfaction with particular instructors, so some steps will be taken to avoid this result in the future.

A few conclusions can be drawn from the data obtained from the survey. Younger students tended to have the highest level of dissatisfaction in almost every category. Students in Freshman Engineering were far more satisfied than University College students with advising. Students (especially University College students) expressed dissatisfaction with career planning assistance, department selection, study skills development and opportunities for networking with fellow students and faculty through professional societies. Help sessions need to be evaluated. Quality of instruction could be improved.

FRESHMAN ENGINEERING STUDENT SATISFACTION SURVEY
SPRING 2003

The Freshman Engineering Program is interested in assessing your overall development and growth as a student while attending Freshman Engineering courses. We are also very interested in understanding the needs and wishes of our students, particularly in helping students persist in their education and in assisting them to succeed in coursework. The survey includes your opinions about the facilities and the learning environment now present in helping you to achieve your goals as a student. **This survey is intended for Freshman Engineering students only and should be filled out once during the semester. Students of junior or senior standing should complete surveys given by their respective departments (mechanical engineering or electrical and computer engineering).**

School: ☐ University College ☐ Engineering & Technology ☐ Other _____

Class Standing: ☐ Freshman ☐ Sophomore

Gender: ☐ M ☐ F **Age:** ☐ 17-20 ☐ 21-25 ☐ >25

Instructions: Please circle the response that best fits your satisfaction using the scale:

1 = Very Dissatisfied and, **5 = Very Satisfied**. If the item does not apply, please mark N/A.

1	Quality of instruction.	**1 2 3 4 5 N/A**
2	Quality of Engineering & Technology computer labs.	**1 2 3 4 5 N/A**
3	Quality of student support in adjusting to college.	**1 2 3 4 5 N/A**
4	Quality of ENGR 196/197 help sessions in aiding classroom performance.	**1 2 3 4 5 N/A**
5	Quality of academic advising.	**1 2 3 4 5 N/A**
6	Scheduling of ENGR 195, 196, 197 (class times and frequency of course offered).	**1 2 3 4 5 N/A**
7	Classroom environment conducive to learning.	**1 2 3 4 5 N/A**
8	Career planning assistance, department selection (ME/ECE/others), and study skills development.	**1 2 3 4 5 N/A**
9	Opportunities for networking with fellow students and faculty through professional societies such as ASME, SAE, AIAA, SWE, NSBE, etc.	**1 2 3 4 5 N/A**
10	Overall freshman experience on the IUPUI campus.	**1 2 3 4 5 N/A**
11	Overall quality of Freshman Engineering education.	**1 2 3 4 5 N/A**

Comparing Average Scores of Freshman Engineering Survey by Age

	Age			
Data	>25	17-20	21-25	(blank)
Average of Question1	3.68	3.41	3.70	3.14
Average of Question2	3.67	3.86	4.13	3.71
Average of Question3	3.82	3.35	3.92	3.80
Average of Question4	3.13	3.56	3.44	2.60
Average of Question5	4.14	3.61	4.18	3.29
Average of Question6	3.74	3.70	3.89	4.14
Average of Question7	3.73	3.71	3.95	3.57
Average of Question8	3.86	3.21	3.90	2.60
Average of Question9	3.60	3.11	4.14	2.80
Average of Question10	3.64	3.37	4.00	3.71
Average of Question11	3.74	3.41	3.76	3.57

Comparing Average Scores of Freshman Engineering With Other Units

Average of Value	School				
Question Number	ET	Science	UC	(blank)	Overall Ave.
Question1	3.54	4.00	3.44	3.75	3.52
Question2	3.91	4.00	3.76	3.25	3.84
Question3	3.57	5.00	3.56	3.00	3.56
Question4	3.51	5.00	3.13	3.00	3.38
Question5	4.05	5.00	3.42	3.50	3.83
Question6	3.87	4.00	3.58	3.75	3.77
Question7	3.75	4.00	3.80	3.00	3.74
Question8	3.51	4.00	3.34	3.00	3.44
Question9	3.43	4.00	3.13	3.33	3.33

Question10	3.57	4.00	3.51	3.50	3.55
Question11	3.63	4.00	3.43	3.50	3.56
Grand Total	3.69	4.27	3.50	3.33	3.62

FRESHMAN ENGINEERING PROGRAM 2003 ASSESSMENT ANNUAL REPORT
Based on ABET outcomes

Prepared by Freshman Engineering Staff
11-Aug-03

1	2	3	4	5	6	7
Program outcomes	**Measurable outcomes: What will the student know or be able to do?**	**Courses Reflecting the Outcomes**	**Methods of Teaching/Learning**	**How do you measure each of the desired behaviors listed in column 2?**	**What are findings in assessing general outcomes (column 1)?**	**Proposed improvements (and changes) based on available assessment findings?**
(a) Ability to apply knowledge of mathematics, science, and engineering	Students will be able to use matlab to perform computations involving scalars, vectors and matrices. Students will be able to use ProE to create solid models of objects	ENGR 196, ENGR 197	Lectures, computer assignments, labs, group discusions, and homework assignments.	Tests, homeworks, computer programs, course outcome surveys, student satisfaction surveys	Quantitative assessment across sections is not available. Some of the program outcomes are covered in Math 163, Math 164 & Phys 152. These are not taught by Freshman Engineering	Use of standardized exams for the different sections of courses may help better assess the program outcomes. Revise the student satisfaction survey to provide additional assesment data, see attached copy used Spring '03.
(b) Ability to design and conduct experiments, as well as to analyze and interpret data	Students will be able to conduct experiments by following instructions for set up of simple experiments. Students will be able to obtain experimental numerical or graphical data and to compare results with theoretical	ENGR 196	Tutorials in class, lectures, computer assignments, lab work, group discusions, homework assignments, and Web resources	Evaluation of results of group discussions and group projects using scoring rubrics for term papers and term projects reports; grading of reports. Grading of reports	Little or no design component. Three experiments in electrical circuits are conducted by students. Analysis is limited to answering specific questions, covered in lectures. Some experimental work is also covered in Phys 152, not taught in freshmang engineering	Introduction of hands-on engineering design and built projects, to arouse student interest and participation in the field of engineering. This may require the review of current course content to meet the changing needs of the freshmen.
(d) Ability to function on multi-disciplinary teams	Students will be able to work in small groups, provide an oral presentation of semester project. Prepare reports, set up electrical circuits.	ENGR 195, ENGR 196	Laboratory experiments for ENGR 196 - Electrical Engineering portion; group discusions of results, preparation of written reports and oral presentation of semester projects for ENGR 195; lectures and team building exercises	Lab reports, project presentation grades, and peer evaluations	Current group work appears to provide sufficient interaction between students, but not all teams are functioning well. Not all freshman students have declared a discipline, but teams are made up of students of different intended	Encourage student participation in student organizations and activities (ASME, NSBE, robots, moon buggy) at freshman level. Include more specific teamwork instruction in ENGI 195.

Program outcomes	Measurable outcomes: What will the student know or be able to do?	Courses Reflecting the Outcomes	Methods of Teaching/Learning	How do you measure each of the desired behaviors listed in column 2?	What are findings in assessing general outcomes (column 1)?	Proposed improvements (and changes) based on available assessment findings?
(e) Ability to identify, formulate, and solve engineering problems	Starting with a given problem, student will be able to devlop and solve algorithms with Matlab or C programs. Students will be able to solve for electrical circuit voltages and currents using PSpice.	ENGR 196, ENGR 197	Lectures and class exercises.	Tests, homework.	Complaints were received from some students in Engr 197 regarding learning both Matlab and C programing in one semester. Too much is covered in a short time.	Review freshman courses to look at a possible rearrangement of content. Offer Matlab and C programming as separate modules.
(g) Ability to communicate effectively	Students will be able to write reports and make project presentations to peers.	ENGR 195	Project reports, oral presentations including slides, lectures, and peer evaluations.	Written report and oral presentation evaluations.	Communication skills are taught in COMM R110 & ENG W131 as well as in ENGR 195. Assessment results for ENGR have not been solicited explicitly.	Include in outcomes assessment in the future.
(h) The broad education necessary to understand the impact of engineering solutions in a global and societal context	Students will demonstrate awareness of global impact of engineering on society and environment.	ENGR 195	Lectures, literature surveys and case studies.	Homework and project reports.	Not quantitatively assesed as a separate outcome in outcomes or program assessment.	Include in outcomes assessment in the future.
(j) A knowledge of contemporary issues	Students should be aware of role of engineering in contemporary issues	ENGR 195	Lectures and literature surveys.	Homework and project reports.	Not quantitatively assesed as a separate outcome in outcomes or program assessment.	Include in outcomes assessment in the future.
(k) Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	Students will be able to use engineering tools like ProE, Matlab, Excel, and PSpice to complete engineering assignments, to use Front Page to develop web pages, and to perform library and web searches.	ENGR 195, ENGR 196, ENGR 197	Lectures, classroom assignments, tutorials, homeworks, and laboratory work.	Graded assignments, lab reports, test scores.	Quantitative assessment is not available across sections.	Evaluate participation in help sessions. Find a way to standardize exam questions across sections.

MECHANICAL ENGINEERING BS 2003 ASSESSMENT REPORT
Report for 2002/2003 Academic Year
Prepared by: ME Assessment Committee

1a Program Outcomes	1b Principles of Undergraduate Learning (PUL)	2 Measurable Outcomes	3a Courses Reflecting the Outcomes	3b Mode of Learning/ Teaching Strategies	4 Tools Used for Assessment	5 Assessment Findings	6 Changes (a) - Implemented (b) - Planned	7 Impact
a Demonstrate and apply knowledge of mathematics, science, and engineering with: i) calculus-based physics in depth; ii) mathematics through multivariate calculus, differential equations, and linear algebra; and iii) probability and statistics; mechanical engineering sciences.	2a, 2b, 3a, 3b	Ability to solve basic linear equations using linear algebra, differential equations; probability and statistics; and to apply them in solid and fluid mechanics and heat transfer.	MATH 262, 263 ME 270, 274, 330, 340.	Mode of Teaching: - Class Lectures - Labs & Tutorials in class - Homework, outside class	- Tests - Homework - Rubrics of ME courses - Course outcomes survey - Faculty feedback - Student satisfaction survey - Program outcomes (exit) survey - Alumni survey	- Surveys indicated that there is room for improvement.	**2001/2002** - Computer simulations with Matlab are used in almost all these courses. **(a)** _____ **2002/2003** - More statistics and probability related work. **(b)** - More tutoring services. **(a)** and **(b)** - Continue to revise and update curriculum. **(b)**	Exit surveys indicate 80% satisfactory above the threshold of 4.0 (out of 5.0) for all categories except in probability and statistics.

1a Program Outcomes	**1b Principles of Undergraduate Learning (PUL)**	**2 Measurable Outcomes**	**3a Courses Reflecting the Outcomes**	**3b Mode of Learning/ Teaching Strategies**	**4 Tools Used for Assessment**	**5 Assessment Findings**	**6 Changes (a) – Implemented (b) – Planned**	**7 Impact**
b Conduct experiments methodically, analyze data, and interpret results.	1, 3	From the quality of generated lab reports, which showed that the students are able to conduct experiments and analyze data using basic statistics such as regression analysis.	ME 272, 310, 314, 340, 372.	- Derivation of theoretical formulas on which experiments are based. - Demonstration of experiments. - Illustration of how to use computer in analysis, charting and report utility. - Assign lab reports to be written individually, and sometimes in groups.	- Tests - Homework - Rubrics of ME courses - Course outcomes survey - Faculty feedback - Student satisfaction survey - Program outcomes (exit) survey - Alumni survey	- Lack of multiple experiment stations in labs. - Quantity and quality of experiments need improvement.	**2001/2002** - Need to upgrade and provide more experiment stations. **(a)** and **(b)** - Standardized report writing. **(a)**	Exit surveys indicate 80% satisfaction above the threshold of 4.0 (out of 5.0)

1a Program Outcomes	1b Principles of Undergraduate Learning (PUL)	2 Measurable Outcomes	3a Courses Reflecting the Outcomes	3b Mode of Learning/ Teaching Strategies	4 Tools Used for Assessment	5 Assessment Findings	6 Changes (a) - Implemented (b) - Planned	7 Impact
c. Design a system, component, or process to meet desired needs, with specific ability to design mechanical systems and thermal systems.	1c, 1d, 1e, 2a, 2b, 2d, 2e, 3b, 3c, 4a, 4c, 5b, 6a, 6b	Students will design technically competent, functional, and socially acceptable mechanical and thermal systems. Students will creatively generate multiple design ideas based on functional decomposition, and evaluate them based on customer requirements.	ME students are required to take the design sequence of ME 262, 372, 462. They also solve design problems in other courses when assigned.	ME 262, 372, and 462 are design courses with specific training in design process, techniques, and implementation. ME 262 teaches design process and mechanism design. ME 372 teaches machine element design for motion and strength. ME 462 is the capstone design course that requires completion of a challenging design project.	- Design project reports and presentations in courses - Assessment of ME 462 work by a jury of faculty, professional engineers, and peers - Tests - Homework - Rubrics of ME courses - Course outcomes survey - Faculty feedback - Student satisfaction survey - Program outcomes (exit) survey - Alumni survey - Industrial advisory board	The quality of design projects is improving. Design should be introduced early in curriculum. Thermal design opportunities are insufficient. Quality of reporting is inconsistent.	**<u>2001/2002</u>** ME 414, a new elective course on thermal design, introduced for Fall 2002. **(a)** Standardized format of project reports. **(a)** Major revisions were made in ME 262, 372, 462 contents. **(a)** and **(b)** Seminar speakers module was added to ME462. **(a)** and **(b)** _____ **<u>2002/2003</u>** ME 414 will become a mandatory course in ME curriculum starting from Fall 2003. **(b)**	Exit surveys indicate 80% satisfaction above the threshold of 4.0 (out of 5.0) for mechanical systems, and 3.9 (out of 5.0) for thermal systems.

1a **Program Outcomes**	**1b** **Principles of Undergraduate Learning (PUL)**	**2** **Measurable Outcomes**	**3a** **Courses Reflecting the Outcomes**	**3b** **Mode of Learning/ Teaching Strategies**	**4** **Tools Used for Assessment**	**5** **Assessment Findings**	**6** **Changes** **(a) - Implemented** **(b) - Planned**	**7** **Impact**
d Function in teams to carry out multidisciplinary projects.	1c, 4c, 5c	Students will be able to work in multidisciplinary projects effectively.	ENGR 195, ENGR 196, ME 482 and ME 462.	- Design teams in ME 462. - Group Discussions - Project based learning - Laboratory experiments	- ME 462 Capstone Design Rubrics - Tests - Homework - Lab and project reports - Rubrics of ME courses - Course outcomes survey - Faculty feedback - Student satisfaction survey - Program outcomes (exit) survey - Alumni survey	Need more emphasis on team work. There is room for improvement.	**2002/2003** Introduction of multidisciplinary projects in ME 462 capstone design course. **(a)** and **(b)**	Exit surveys indicate more than 80% satisfaction above the threshold of 4.0 (out of 5.0)

1a Program Outcomes	1b Principles of Undergraduate Learning (PUL)	2 Measurable Outcomes	3a Courses Reflecting the Outcomes	3b Mode of Learning/ Teaching Strategies	4 Tools Used for Assessment	5 Assessment Findings	6 Changes (a) - Implemented (b) - Planned	7 Impact
e Identify, formulate, and solve engineering problems.	1b, 1d, 2a-e, 3a, 3c, 4a-c	Students will be able to translate a need into a design project. Starting with textbook problems, students will be able translate word problem into an engineering solution.	ME students are required to take ENGR 197; and ME 200, 262, 270, 272, 274, 310, 314, 330, 340, 372, 462 and 482.	ENGR 197, and ME 200, 262, 270, 272, 274, 310, 314, 330, 340, 372, 462 and 482 are traditional lecture type classes. They also include lab exercises, where instructors lecture on the subject and students solve homework problems. In design courses, instructors teach students how to turn customer requirements into a product. Students design the product based on these requirements.	- Project reports - Tests - Homework - Lab and project reports - Presentations - Rubrics of ME courses - Course outcomes survey - Faculty feedback - Student satisfaction survey - Program outcomes (exit) survey - Alumni survey	Satisfactory, but also needs further improvement.	**2002/2003** More tutoring services for basic engineering science courses. **(a)** and **(b)** **2002/2003** Increase undergraduate student involvement in research. **(b)**	Exit surveys indicate more than 80% satisfaction above the threshold of 4.0 (out of 5.0)

1a Program Outcomes	**1b Principles of Undergraduate Learning (PUL)**	**2 Measurable Outcomes**	**3a Courses Reflecting the Outcomes**	**3b Mode of Learning/ Teaching Strategies**	**4 Tools Used for Assessment**	**5 Assessment Findings**	**6 Changes (a) - Implemented (b) - Planned**	**7 Impact**
f Understand professional and ethical responsibilities.	1b, 2a, 2b, 2e, 3b, 3c, 4b, 5b, 5c and 6a	Students should be able to accept professional and ethical responsibilities for their deeds. .	ME 401 and ME 462.	Professional speakers in ME 462. Case studies in ethics. Participation in professional society meetings.	- Tests - Homework - Course outcomes survey - Faculty feedback - Program outcomes (exit) survey - Alumni survey - Fundamental of Engineering (FE) Exam - Undergraduate Student and Industrial Advisory Boards	There is room for improvement.	**2002/2003** Introduction of more outside speakers and case studies. **(a)** and **(b)** Revised Co-op/Internship programs to attract more students. **(b)**	Exit surveys indicate more than 80% satisfactory above the threshold of 4.0 (out of 5.0)

1a Program Outcomes	**1b Principles of Undergraduate Learning (PUL)**	**2 Measurable Outcomes**	**3a Courses Reflecting the Outcomes**	**3b Mode of Learning/ Teaching Strategies**	**4 Tools Used for Assessment**	**5 Assessment Findings**	**6 Changes (a) - Implemented (b) - Planned**	**7 Impact**
g Communicate effectively in writing and orally.	1a, 1c	Students will be able to write effective lab and project reports. Students will be able to give good oral presentations of work. Students will be able to prepare effective posters to demonstrate work.	ENGR 195, ME 262, ME 274, ME 310, ME 314, ME 340, ME 372, ME 462, ME 482, TCM 360	Traditional lectures. Project reports in ME 262, ME 372, ME 462, ME 482. Lab reports in ME 274, ME 340, ME 310, ME 314, ME 340, ME 372. Presentations in ENGR 195, ME 462, TCM 360.	- Homework - Lab and project reports - Presentations - Rubrics of ME courses - Course outcomes survey - Faculty feedback - Program outcomes (exit) survey - Alumni survey - Assessment rubrics in lab and project reports. - Alumni surveys - Essays in ME 401 and general education courses.	Course outcomes surveys indicate satisfactory performance in several courses. Alumni surveys indicate the need for improvement. Assessment rubrics in key courses indicate satisfactory performance.	**2001/2002** Standardized lab report format and grading rubrics. **(a)** Standardized project report format and grading rubrics in design courses. **(a)** Exemplary student project samples are made available on the department Web site. **(a)** Introduced written and oral communication into curriculum at an earlier stage than before. **(a)** **2002/2003** Emphasized importance of communication in additional courses. **(b)**	Exit surveys indicate more than 90% satisfaction above threshold of 4.0 (out of 5.0). Highest of all outcomes a-k.

1a Program Outcomes	**1b Principles of Undergraduate Learning (PUL)**	**2 Measurable Outcomes**	**3a Courses Reflecting the Outcomes**	**3b Mode of Learning/ Teaching Strategies**	**4 Tools Used for Assessment**	**5 Assessment Findings**	**6 Changes (a) - Implemented (b) - Planned**	**7 Impact**
h Understand the impact of engineering solutions in a global and societal context through broad education.	2c, 4b, 5a, 5b, 6a, 6b	Students should be aware of environmental and societal impact of their engineering solutions. Students should consider safety aspects of their designs. Students should be aware of global issues. Graduates should be more effective in public policy making.	All general education electives taken from liberal arts (18 credit hours). ENGR 195, ME 372, ME 401, ME 462.	Traditional lectures. Seminar speakers on the subject. Group discussions. Presentations in ENGR 195. Presentations, essays, and discussions in ME 401. Study of design impacts on environment, safety, and society in ME 372 and 462. Lectures and essays in general education courses.	- Project reports - Presentations - Rubrics of ME courses - Course outcomes survey - Faculty feedback - Student satisfaction survey - Program outcomes (exit) survey - Alumni survey - Essays required on the topic in major project reports - Essays in ME 401 and general education courses.	More awareness to be created with emphasis in more courses. There is a need to make the general education courses restricted to these general topics.	**<u>2001/2002</u>** Created assessment methods to track the student response in ME 401, ME 372, ME 462 courses. **(a)** Planned to collaborate with liberal arts to select and assess a set of courses addressing these topics. **(b)** **<u>2002/2003</u>** Reorganized general education electives list to cover these topics to be in effect starting Fall 2003. **(b)**	Exit surveys indicate more than 80% satisfactory above threshold of 4.0 (out of 5.0). Recently dropped below 4.0.

1a Program Outcomes	**1b Principles of Undergraduate Learning (PUL)**	**2 Measurable Outcomes**	**3a Courses Reflecting the Outcomes**	**3b Mode of Learning/ Teaching Strategies**	**4 Tools Used for Assessment**	**5 Assessment Findings**	**6 Changes (a) - Implemented (b) - Planned**	**7 Impact**
i Recognize the need to engage in lifelong learning.	1b	Students will realize the importance of continuing education to keep-up with ever changing technology after graduation. Students will view graduate school as an important part of professional growth. Students will plan early to pursue advanced degrees.	ME 344, TCM 360, and ME 462.	Seminar speakers in ME 462. Speakers of student chapters of professional societies. Emphasis of continuing education in various courses. Emphasis on FE (student in-training) exam in senior courses.	- Course outcome surveys - Faculty feedback - Program outcomes (exit) survey - Alumni surveys - ME 462 final project assessment	Course outcomes surveys indicate satisfactory performance. Assessment rubric in ME 462 indicates satisfactory performance with room to improve. Very few students sign-up for FE exam, because of time crunch in senior year and no immediate incentive.	**2001/2002** Added a seminar component to ME 462 capstone design course. **(a)** Emphasized more on FE exams and graduate studies. **(a)** and **(b)** More outside speakers to be invited to stress the topic. **(a)** and **(b)** **2002/2003** Planned a combined BS/MS program in ME. **(b)** Offered an FE Exam preparation course to ME and ECE students for the first time. **(a)**	Exit surveys indicate more than 80% satisfactory above the threshold of 4.0 (out of 5.0).

1a Program Outcomes	1b Principles of Undergraduate Learning (PUL)	2 Measurable Outcomes	3a Courses Reflecting the Outcomes	3b Mode of Learning/ Teaching Strategies	4 Tools Used for Assessment	5 Assessment Findings	6 Changes (a) - Implemented (b) - Planned	7 Impact
j Demonstrate knowledge of contemporary issues.	3c, 4b, 5a, 5b, 6a	Student work shows awareness of contemporary issues. Graduates and employers report of satisfaction with knowledge of contemporary issues.	ME 401, ECON201 and general education electives.	ME 401 covers ethical and related issues. General education courses including ECON E201 covers contemporary issues. Study of design impacts on environment, safety, and society in ME 372 and 462.	- Homework, discussions and exams in ME401 - Course outcomes survey - Faculty feedback. - Program outcomes (exit) survey - Alumni and employer surveys - Incorporation of environmental, safety and social impact considerations in ME 462 design project	Anecdotal evidence that students are aware of most issues, but insufficient coordination to ensure coverage of important issues.	**2202/2003** Plan to require a general education course that covers contemporary issues relevant to engineering. **(b)**	Exit surveys indicate more than 70% satisfaction above threshold of 4.0 (out of 5.0) – somewhat on the lower end.

1a **Program Outcomes**	1b **Principles of Undergraduate Learning (PUL)**	2 **Measurable Outcomes**	3a **Courses Reflecting the Outcomes**	3b **Mode of Learning/ Teaching Strategies**	4 **Tools Used for Assessment**	5 **Assessment Findings**	6 **Changes (a) - implemented (b) - planned**	7 **Impact**
k The ability to use the techniques, skills, and modern engineering tools necessary for engineering practice with: i) engineering analysis tools; ii) engineering design and manufacturing tools; iii) Internet and library resources; and iv) mathematical computing analysis tools.	1e, 3b-c, 4a	Completion of assigned projects using various technologies and engineering tools.	ENGR 195, 196, 197 ME 262, 272, 330, 340, 372, 310, 314, 482 and most of the ME electives.	ENGR 195, 196, 197 ME 262, 272, 340, 372, 310, 314, and 482 have labs where instructors lecture on the subject, students practice on the technologies. Numerical simulations are introduced in ME330 and most ME Electives.	- Lab reports - Project reports - Homework assignments - Completion of assigned tasks was assessed using a departmental lab report assessment rubrics - Homework, discussions and exams in ME 401 - Course outcomes survey - Faculty feedback - Program outcomes (exit) survey - Alumni and employer surveys	Adequate engineering computing tools are covered. More student training is needed.	**<u>2002/2003</u>** Tools to be introduced at earlier stages so that they can be well practiced. **(a)** and **(b)**	Exit surveys indicate more than 80% satisfaction above the threshold of 4.0 (out of 5.0) for information and math tools. Satisfaction is somewhat lower in using engineering analysis and design tools categories.

MECHANICAL ENGINEERING TECHNOLOGY AS AND BS 2003 ASSESSMENT REPORT

Prepared by Sally Frettinger-Devor

May 1, 2003

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
CGT 211	Photo design and production with the world's leading image processing and enhancement software for print and Web. Digital images are produced, modified and retouched through assignments stressing practical productivity techniques as well as expressive creativity. Topics such as composition, background removel, image swapping, colorizing, type creation and additive special effects are covered. This course gives in-depth instruction in the use and applications of image manipulation as it applies to advertising, print and multimedia.	Demonstrate differences between vector and raster illustrations	TBD--See attached memo		Projects, lab exercises, quizzes, homework assignments+F17	TBD	TBD	AS/BS CGT	
		Demonstrate bitmap imaging attributes							
		Application of common imaging application features (layers, channels, paths, filters, color adjustment and correction tools)							
		Skill in using raster graphic display and print technologies							
		Demonstrate understanding and knowledtge of color theory, color models and color systems							
		Apply vector to raster conversion methods, compression technologies							
		Demonstrate proficiency in texture generation, photographic reproduction and manipulation, interpretive imaging, scientific/technical imaging and self-promotion							
CGT 100	Introduction to academic and professional opportunities in computer graphics. Topics include: computer graphics terminology, graphics software, digital resume and portfolio.	Learn about various CGT courses	1b,c, e, 2e, 3, 4b, 5, 6			TBD	TBD	AS/BS CGT	
		Introduction to portfolios							
		Demonstrate general knowledge of industry							
		Demonstrate ability to develop a resume			Resume and cover letter assignment				
		Demonstrate general knowledge of a variety of different graphic programs.							
CGT 216	Color theory, surface analysis, rendering techniques as related to vector-based illustrations.	Demonstrate understanding of nature of digital color in both additive and subtractive models			Projects, lab exercise, homework assignments, quizzes, final project	TBD	TBD	AS/BS CGT	
		Specify color in RGB, HLS, CMYK, and Pantone systems							
		Distinguish suitability of vector and or raster imaging applications for particular illustration tasks.							
		Distinguish between file format choices related to storage, display and transportability of graphic files.							
		Demonstrate skill in an industry-standard vector illustration tool.							
		Secure high-quality color output from service bureaus							
		Apply principles of light, shade and shadow as they apply vector renderings							
		Demonstrate differences between axonometric and perspective drawings							
		Demonstrate proper lighting considerations for mixing different images.							
CGT 241	Introduction of the knowledge base on which digital animation and spatial graphics technology are founded and developed. Emphasis will be on developing a working knowledge of the mechanics of 3D geometric formats, spline based modeling with polygon modeling, rendering methods, hierarchical linking, and kinematic fundamentals.	Demonstrate strategic planning methods to optomize geometry creation for efficiency			Projects, lab exercises, final project	TBD	TBD	BS CGT	
		Create and modify complex shapes using 3D stuiod Max							
		Ability to use vertices, grids and other mesh controls							
		Predict and accurately place lights and cameras within a 3DS scene							
		Ability to use materials editor to modify existing materials and create unique ones							
		Ability to animate objects over a specific period of time							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Apply design parameters to achieve a pre-defined animation outcome							
		Elicit emotions from the viewer through the use of sound, timing and special effects							
CGT 340	Development of working knowledge of perspective display of three-dimensional models and the resulting effects of projected light sources on shade, shadow, color, texture, and atmospheric erffects in architecture, product illustration and animation with focus on commerical graphic applications	Demonstrate knowledge of physical and virtual technology of lighting			Photographs, papers, projects, final projects.	TBD	TBD	AS CGT	
		Knowledge of vocabulary and graphical convections of lighting design.							
		Desmonstrate knowledge of body of work that lighting design is based upon.							
CGT 416	Capstone project in computer graphics technology	Creation and management of media assets per proposal			Final Project	80% Successfully complete per criteria	Yes	BSCGT	
CGT 346	Covers the use of digital technologies for video and audio focused toward use in multimedia, hypermedia and animation products. Students examine the methods for creating, sampling, and storing digital video and digital audio and the contraints placed on these media assets when used for media based products. Emphasis is placed upon the technology of digital video and audio including formats, data rates, compressors, and the advantages and disadvantages of the different technologies.	Ability to integrate the use of multiple vide and audio tracks			Labs, projects, final project	TBD	TBD	BS CGT	
		Incorporate transitions effectively to create seamless change between elements							
		Ability to use multiple layers to enhance the visual experience of the viewer.							
		Recycle movie elements with Alpha Channels							
		Composite blue screen segments to integrate live and computer-generated scenes.							
		Ability to create traveling Mattes and other special effects							
		Demonstrated techniques in advanced video compression							
CGT 351	Introduce the many facets of interactive multimedia design and production. Students introduced to interation-based authoring programs used for information delivery with special attention focused on the integration of various media assets for communication. Concentration on the storage, management and retrieval of media assets in a production environment.	Demonstrate knowledge of disciplines involved with multimedia development			Assignments, labs, exams, projects	TBD	TBD	BS CGT	
		Knowledge of the five major steps in multimedia development							
		Knowledge of the current standards and guidelines for multimedia development and delivery							
		Utilization of analog and digital audio in quthoring programs							
		Ability to incorporate vide and animation into interactive multimedia							
		Know fundamental principles behind good interface design							
		Basic knowledge of how to program interactivity into a multimedia product.							
		Ability to list major points of concern in application development							
		Knowledge of distribution and deployement concerned with multimedia							
		Demonstrate knowledge of legal issues involved with multimedia production and delivery							
TECH 581	A continuation of study of the multimedia development process, with an emphasis in game development. Integration of text, graphics, sound, video and animation into authoring software to entertain, persuade or educate.	Logic development for good game play			Projects, f+F224inal Project	TBD	TBD		
		Demonstrate understanding of of standards and guidelines for multimedia development and delivery							
		Demonstrate knowledge of the fundamental principles behind good interface design							
		Capability to oprogram interactivly into a multimedia product							
		Incorporate video and animation into interactive multimedia projects							
		Ability to compile and compress applications							
		Knowledge of distribution and deployement concerned with multimedia							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Demonstrate knowledge of legal issues involved with multimedia production and delivery							
CGT 120	Basic course in electrical and electronic drafting, utilizing multiview and isometric drawing, sectioning, and dimensioning practices. Documentation of design through schematic diagrams, wiring diagrams, and printed circuit board layout. Application of graphics standards for electronic, power, and industrial control circuitry.	Ability to utilize symbols, orthographic projection, sketching, pictorial representation and related practices in the interpretation of electrical fabrication and electronic industrial prints.			Laboratory assignments, final project	TBD	TBD	AS CGT	
		Ability to visualize spatial three-dimensional objects on a two-dimensional drawing surface							
		Master basic principles involved in executing and dimensioning orthographic and pictorial drawings							
		Ability to execute block and logic diagrams							
		Ability to execute schematic diagrams							
		Ability to execute printed curcuit board details and assemblies							
		Ability to execute CAD of schematics and printed curcuit boards							
		Master techniques needed to fabricate a printed circuit board							
CGT 116	Core introductory computer graphics ourse that provides entry level experiences in geometric modeling. Students develop geometric analysis and modeling construction strategies and processes to produce accurate computer models for graphic visualization and communication using AutoCAD200i and Thinoceros software	Distringuish between wireframe, surface and solid modeling and their applications to various communicative problems and tasks.			Drawing assignments, exams, final projects in both software packages.	TBD	TBD	AS/BS CGT	
		Proficiency in 3D models using AutoCAD and Rhino software							
		Apply 2D and 3D geometric entities in graphic communication							
		Developed 3D spacial environment understanding and mental visualization ability.							
		Ability to create 3D computer models from 2D multiview engineering drawings							
		Extract 2D orthographic, section and auxiliary views from 3D models for realistic look							
		Ability to add virtual lighting to 3D models and environments to create photorealistic renderings							
MET 111	Study of force systems, resultants and equilibrium, trusses, frames, centroids of areas, and center of gravity of bodies.	Demonstrate use of SI units and US Customary system of Units	1a,b,d,2d,4a		Graduation Exam	70% average score	No	AS/BS MET	
		Apply the parallelogram law to determine the resultant of two forces							
		Resolve a force into two components using the parallelogram law							
		Resolve two or more forces into x and y components and determine the resultant of forces by summing the components							
		Determine the unknown forces acting on a particle in equilibrium by applying the equilibrium equations							
		Determine the resultant of three or more space forces by summing their rectangular components							
		Determine three unknown forces acting on a particle in space, that is in equilibrium, by applying the equilibrium equations.							
		Apply the principle of the transmissibility of forces.							
		Apply Varigon's Theorem							
		Determine the moment of a couple							
		Determine the resultant of a non-concurent coplanar force system							
		Construct free-body diagrams							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Apply the quilibrium equations to free-body diagrams to determine unknown forces.							
		Determine the center of gravity of a two-dimensional body.							
		Determine the support reactions of beams supporting distributed loads.							
		Demonstrate method of joints and the method of sections to determine the load in each truss member							
		Determine the forces acting in frames and machines							
		Determine the force required to place a system of wedges in equilibrium by applying the laws of dry friction and the angle of friction							
		Determine the moment of inertia of an area							
		Determine the radius of gyration of an area							
MET 112	Ability to analyze motions, displacements, velocities, instant centers, cams, linkages and gears	Define link, frame, mechanism, and machine			TBD			AS/BS CGT	
		Able to identify the kinematic symbols for fixed surface, pin joint, sliding motion on a fixed surface, relative sliding motion, link, gear, pulley, flywheel, and friction wheel							
		Sketch kinematic diagrms							
		Identify link names of four-bar linkages							
		Identify six basic types of four-bar linkages							
		Define top and bottom dead center position, pairing, kinematic chain, structure, inversion							
		Define the three types of place motion							
		Students can identify the five fundamental machines							
		Determine the class of four-bar linkage using the John A. Hrones test criteria							
		Identify basic mechanisms							
		Identify type of motion between the links of a mechanism							
		calculate stroke of slider-crank mechanisms							
		calculate timing angles, time, and displacements of four-bar linkages							
		Identify the methods of transmitting motion in mechanical mechanicms							
		Synthesize simple four-bar linkages							
		Calculate the transmission angle in a four-bar linkage							
		Identify the line of transmission in simple mechanisms							
		Define couple point and coupler curve							
		Define rolling contact							
		Synthesize spur gear and friction wheel drives							
		Define and calculate angular distance and angular displacement							
		Calculate linear and angular velocity in simple mechanisms using the vector component, instant center, and relative velocity methods							
		Calculate linear and angular acceleration in simple mechanisms							
		Identify the different types of cams and cam followers							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Define cam terminology							
		Determine prime circle radius, pressure angle, and cam follower offset using monographs.							
MET 212	Applications of engineering mechanics are introduced, based on an elementary expansion of Mewtonian physics as applied to static and dynamic force systems. Internal stresses and strains produced by these forces in selected machine elements are condisered.	Sum forces in vertical and horizontal directions			TBD: Electives aren't being actively assessed at this point.			AS/BS MET	
		Construct free-body diagrams							
		Calculate mechanical advantage of a pulley mechanism							
		Define tension and recognize tension numbers							
		Define stress and strain							
		Calculate normal stress							
		Determine stress concentration factors from graphs by Peterson							
		Distinguish between stress and pressure							
		Define yield strength							
		Distinguish between elasticity and plasticity							
		Calculate elongation using the definition of Young's modulus							
		Define compression							
		Calculate the normal stress in two materials that comprise a short column							
		Calculate thermal stress							
		Define shear							
		Calculate shear stress							
		Define Poisson's ratio							
		define torsion							
		Calculate the moment of a force							
		Define couple and calculate it's moment							
		Calculate the shear stress in a circular shaft due to a torsional load							
		Calculate the angle of twist in a circular shaft due to a torsional load							
		Apply the parallelogram law to determin the resultant of two forces							
		Resolve a force into two components using the parallelogram law							
		Resolve two or more forces into x and y components and determine the resultant of the forces by summing the components							
		Apply the equilibrium equations to free-body diagrms to determine unknown forces							
		Students can calculate the support reactions for beams supporting concentrated and distributed load							
		Calculate the ehar forces and bending moments in beams							
		Calculate the location of the centroid of beams having built-up cross sections							
		Calculate the bending stress in beams							
		Calculate the shear stress in a beam							
		Construct shear and moment diagrams							
CIMT 245	Knowledge in tool design methods, tooling materials and heat treatment; design of cutting tools; gage design' design of jigs and fixtures; design of tools for CNC machines; tool design using CAD systems. Tool design term projects using CAD systems required.	Define the process of tool design			Lab projects, final exam	TBD See Memo		BS CIMT	
		Select appropriate type of tool steel for tooling components'							
		Ability to specify the correct type of drill bushing for different drilling applications							
		specify the correct chip clearance for drilling applications							
		Determine the appropriate drill bushing length for different size drills							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Define the function of dowel pins and fasteners in tool design							
		Define the purpose and function of a workholder							
		Define the three types of workpiece location that must be considered when designing a workholder							
		Apply the 3-2-1 method of locating a workpiece when designing a workholder							
		Design locating components for workholders							
		Determine when to incorporate jackscrews and jackpins in workholders							
		Select the appropriate workpiece surfaces for location whern designing a workholder							
		Design diamond pin locators							
		Select the appropriate type of clamping mechanism when designing a workholder							
		Recognixze different types of jig designs and select the appropriate design for the machining operation to be performed							
		Design a simple plate drill jig							
		Complete title blocks and bill of materials on tool drawings							
		Recognize the different types of fixture designs and select the appropriate design for the machining operation to be performed							
		Design a simple milling fixture							
		Recognize the different types of power presses and select the appropriate type of press for various press operations							
		Define the basic mechanical components of a die							
		Distinguish between the principal types of die designs such as progressive and compound							
		Define the major pressowrking oeprations							
		Calculate the center of pressure in a die							
		Specify the proper punch and die clearance							
		Calculate the size of a punch and its corresponding die cavity for a punching operation							
		calculate press tonnage requirements							
		Calculate stripping pressure							
		Calculate flat blank length for a formed part having simple bends.							
CIMT 260	Industrial robot types and their applications in manufacturing. Safety, application limitations, and economic justification will be considered. Automated material handling equipment will be reviewed. Laboratory exercises will involve programming an educational robot using a teach pendant and microcomputers	Define the basic elements in a robot system	1c,e, 2a,2d,2e,3,4a		TBD--Electives are not part of the first phase assessment process.	TBD		BS CIMT	
		Define the position and orientation motions of a mechanical arm							
		Define resolution and repeatability as applied to a robotic arm							
		Define work envelope as applied to a robotic arm							
		Define accuracy as applied to a robotic arm							
		Define degree of freedom of a mechnaical arm							
		Write a task point graph for programming a robot							
		Use a teach pendant to program a robot							
		Define the different types of robot arms based on arm geometry							
		Define the types of robot axes motion							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Select an appropriate type of arm geometry for such applications as material handling, assembly operations, machine tending, spray painting, palletizing,grinding, and welding							
		Define the three types of robot power sources and the advantages and disadvantages of each							
		Define the two primary control techniques							
		Distinguish between the four types of path control used on industrial robots							
		Use the Robotalk language to simulate programming a robotic work cell							
		Distinguish between different types of end of arm tooling and its appropriate applications							
		Select the appropriate sensor to monitor work cell operation							
MET 242	This course surveys the manufacturing processes and tools commonly used to convert cast, forged, molded, and wrought materials into finished products. It includes the basic mechanisms of material removal, measurement, quality control, assembly processes, safety, process planning, and automated manufacturing.	Students will prepare laboratory reports in proper format.	PUL1a.		TBD			AS/BS CIMT	
		Students will demonstrate knowledge of basic material removal processes	PUL1b						
		Students will demonstrate knowledge of non-traditional material removal processes	PUL1b						
		Students will demonstrate knowledge of cutting tool material and geometry characteristics.	PUL1b						
		Students will demonstrate knowledge of metal cutting theory.	PUL1d.						
		Students will be able to calculate machining parameters, material removal rates, machining times and machine horsepower requirements.	PUL1e						
		Students will understand the use of standard machining parameter reference data including CutData software and materials reference books.	PUL4a.						
		Students will demonstrate knowledge of machining practices through laboratory projects.	PUL4a.						
MET 141	An overview of structures, properties, and applications of metals, polymers, ceramics, and composites commonly used in industry is presented. Problem-solving skills are developed in the areas of materials selection, evaluation, measurement, and testing.	To familiarize the student with basic materials and their properties and, in addition, an understanding of the primary processes of manufacturing. Although this is a survey course, it must provide the background needed for subsequent courses in the curriculum.	1a,b,c,2d,4a					AS/BS CIMT	
MET 142	Basic casting, forming, and joining processes are surveyed. The course emphasizes the selection and application of various processes.	This class is designed to introduce 3 of the 4 categories of manufacturing processes (joining, casting, and forming), as the first in a series of two classes. (MET 142 and MET 242) Emphasis is placed on the application of these processes in the manufacturing of everyday products, the advantages and disadvantages of each process, and hands-on experience with some of the equipment used.	1a,b,c,e,2d,e,3 ,4a,5					AS/BS CIMT	
MET 240	A survey of casting processes of past, present, and future. Special emphasis is placed on developing problem solving skills with relation to using cast parts in manufacturing. Students will gain knowledge from lectures, reading assignments, audiovisual presentations, demonstrations, and field trips Each student will also be required to research and write a five page paper on some aspect of the foundry industry or to give a demonstration in the laboratory.	To introduce students to a wide variety of cast metals operations						BS CIMT	
		To give them hands on experiences with metals and molding materials, and techniques used in industry today.							
		Be required to demonstrate their ability to make decisions based on knowledge they have acquired in class as it applies to actual metal casting situations with regard to economic, ecological and human relations considerations.							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
MET 242	This course surveys the manufacturing processes and tools commonly used to convert cast, forged, molded, and wrought materials into finished products. It includes the basic mechanisms of material removal, measurement, quality control, assembly processes, safety, process planning, and automated manufacturing.	The goals of this course are to introduce the students to the basic machine tools of industry and to give them firs hand experiences in preparing and performing many of the basic operations. The students will also be instructed in estimating costs of machine operations and determining their logical sequence of operations.	1a, 1b, 1d, 1e, 2c, 2d, 3, 4a						
MET 344	Metals and polymers are studied. Topics include the bonding of atoms; the structures of crystals and polymers; the coldworking, alloying, and heat treating of metals; and the physical behavior of plastics. Course emphasis is on the development and control of materials properties to meet engineering requirements and specifications.	Atomic structure: nucleus, electron rings, protons, neutrons, and electrons	1a,1b,1c,2a,2d ,2e					As/BS MET	
		Crystalline structure of metals: 3 most common lattices – FCC, BCC, and CPH. Properties of metals possessing these lattice structures.							
		Geometric properties of lattices, Miller Indices, close-packed planes, preferred slip planes and direction							
		Cold-working: How it affects a metals mechanical properties, it's influence on grain size and recrystallization.							
		Annealing: Stages of annealing, purposes of annealing, examples of annealing processes							
		Alloys: Definition, types of binary alloy systems, rules of solubility, phases							
		Phase diagrams: How to read diagram, identify liquidus, solidus, and solvus lines, identify reactions such as eutectic and eutectoid, be able to determine percent composition of mixture phases as well as relative amount of each phase.							
MET 220	A survey of steam power plants, internal combustion engines, heat pumps and refrigeration. Theory of Thermodynamics and heat transfer	Understand thermodynamics as the study of energy and its conversion from one form to another.	1a,1b,1c,1d,1e ,2a,2d,2e,3,4b		TBD			As/BS MET	
		Know how to measure and utilize thermodynamic properties of matter in both English and SI units.							
		Understand pressure in terms of force in a column of fluid.							
		Understand the concept of work and heat as energy forms in transition and how to calculate work in terms o properties of a substance.							
		Differentiate between closed, or non-flow, systems and open, or flow, systems.							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Understand and be able to apply the first and second laws of thermodynamics for both open and closed systems.							
		Obtain values for the properties internal energy, enthalpy and entropy by calculation and from tabulated data.							
		Apply the continuity equation for steady flow systems and understand how this is utilized with the energy equation derived from the first law.							
		Understand specific heat and how it is derived from thermodynamic properties.							
		Derive work and heat for typical thermodynamic processes.							
		Analyze heat engine cycles for work and power output and determine the efficiency of the cycles.							
		Understand the three phases of matter and be able to determine the properties of multiphase fluids.							
		Utilize thermodynamic charts and tables and be able to describe various processes on such charts.							
		Understand the concept of an ideal gas and the governing relationships for properties of gases.							
		Analyze a common refrigeration cycle with the aid of tables and charts and determine the coefficient of performance of the cycle.							
		Understand the three mechanisms of heat transfer and be able to calculate heat transfer rates for each mechanism individually and in combination.							
		Determine the characteristics for simple heat exchangers.							
		Write and present a summary research paper on a form of energy conversion not covered in the formal portion of the course.							
MET 230	A study of the development, transmission, and use of power through fluid power cirtuits and controls	Understand the purposes, applications and advantages of fluid power using hydraulics and/or pneumatics.	1a, 1b, 1c, 1d, 1e, 2a, 2d,		Graduate Exam	70% average score	No	As/BS MET	
		Define and measure key properties of working fluids in both English and SI units.							
		Understand the requirements for fluid power fluids and components.							
		Understand the relationship between pressure and force in a fluid power system.							
		Develop and apply the energy and continuity equations to fluid systems.							
		Calculate hydraulic horsepower and determine the powe requirements of fluid systems.							
		Determine the required sizes of pipes and tubes to carry fluid in a fluid power system.							
		Understand the difference between laminar and turbulent flow and be able to determine which type defines a particular fluid system.							
		Calculate the Reynolds Number and understand its significance in determining frictional losses in pipes, valves and fittings of fluid power systems.							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Understand the operation of various positive displacement pumps and how these differ from other types of fluid pumps.							
		Understand the operation of pressure boosters and intensifiers.							
		Understand the operation of fluid power actuators, hydraulic and pneumatic cylinders, and hydraulic motors.							
		Determine torque and power relationships in hydraulic pumps and motors, their							
		efficiencies, and how torque and power are related to pressure and flow of the fluid							
		Understand the usage of various directional control valves, pressure control valves and flow control valves, and how to select appropriate components.							
		Understand how various fluid power systems operate and how to analyze their performance.							
		Understand the function of accumulators and receivers and how to size them.							
		Understand the factors involved and the components used to insure fluid power system maintenance and safety.							
		Calculate the temperature rise in a fluid power system due to energy losses and how this temperature can be controlled.							
		Understand and apply the perfect gas laws to pneumatic systems.							
		Determine the air pressure losses through pneumatic pipelines and the air flow rates through orifices and nozzles.							
MET 320	The fundamentals of thermodynamics including application of the first and second laws, enthalpy, entropy, and reversible and irreversible processes. Analysis of power cycles and gas turbines.	Understand the concept of a system, both closed and open, and the properties that define the state of a system in both English and SI units	1a, 1b, 1c, 1d, 1e, 2a, 2d, 3		Graduate Exam	70% average score	NO	BS MET	
		Determine pressure as related to a column of liquid and understand the difference between absolute and gage pressure.							
		Understand the absolute temperature scale and the conversion to it from the common scale in both English and SI units.							
		Understand and apply the first and second laws of thermodynamics for both open and closed systems.							
		Apply the continuity equation for steady flow systems.							
		Understand the relationship of heat and other forms of energy including potential, kinetic and internal, as well as work.							
		Calculate the work of a system based on the relationship of pressure and volume using integral calculus.							
		Determine the properties of steam using tables and show steam processes on thermodynamic diagrams.							
		Understand the ideal gas laws and how they are applied. Understand the concept of specific heat of an ideal gas.							
MET 340	Design of plumbing systems, includes losses in pipes, fittings, nozzles, orifices, etc. Includes steam, water, and oil systems. Piping handbooks and catalogs are utilized	Know the characteristics of common piping materials and be able to select the correct material for a particular application			TBD			BS MET	

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
	in conjunction with the State of Indiana Plumbing Code	Know the major components of a sanitary piping system.							
		Design and size a sanitary piping system, waste and vent.							
		Design and size a cold water piping system.							
		Design and size a hot water piping system.							
		Analyze the performance characteristics of pumps.							
		Select and size pumps used to recirculate and boost water pressure.							
		Select and size steam piping used in plumbing systems.							
		Learn national and local plumbing codes and be able to apply them to the design of plumbing systems.							
MET 350	The fundamentals of fluid mechanics, including properties of fluids, pressure, hydrostatic force on submerged areas; kinematics and dynamics of fluid flow; friction and sizing of pipes; selection of pumps.	Differentiate between a gas and a liquid and understand the basic properties of fluids in both English and SI units.	1a, 1b,1c,1d, 1e, 2a, 2d		TBD--Elective			BS MET	
		Understand the concept of dynamic and kinematic viscosity.							
		Understand the concept of manometry and how pressure is related to the height of a column of liquid, both absolute and gage values.							
		Determine the forces on partially and fully submerged plane surfaces and their line of action.							
		Understand the concept of buoyancy and stability; be able to locate the metacenter of a floating body so as to determine its stability.							
		Understand the principle of continuity for steady flow in conduits.							
		Apply the principle of conservation of energy for fluid flow systems.							
		Understand the concept of fluid head and be able to apply the Bernoulli equation.							
		Understand Torricelli's theorem and be able to analyze the emptying of a liquid from a tank with a falling head.							
		Understand the concept of laminar and turbulent flows and be able to determine the Reynolds number of flowing fluids through both circular and non-circular pipes.							
		Analyze energy losses in fluid flow systems that include pumps, turbines, and hydraulic motors using Darcy's equation and the Moody chart.							
		Analyze series and parallel pipe systems to determine flow rates, pipe sizes and energy losses or additions.							
		Understand the principles of flow measurement, how flowmeters operate and how to select an appropriate flowmeter.							
		Understand how various types of pumps operate and how to select the appropriate pump for various flow situations.							
		Design a piping system including a pump to provide a given flow rate for a particular system geometry.							
		Compute the forces on stationary and moving objects due to fluids in motion using impulse-momentum principles.							
		Understand the concept of lift and drag and differentiate between pressure and friction drag.							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Determine the drag coefficients and forces on both stationary bodies in fluid flow and objects moving through a stationary fluid.							
		Describe the characteristics of fans, blowers and compressors.							
		Compute the flow rate of gases through nozzles and ducts and determine the energy losses in an air distribution system.							
MET 360	Investigation of basics required to design heating, ventilating and air conditioning systems. Heat gain and loss, humidification, duct design, equipment selection and solar heating are included. Codes and standards are emphasized.	Determine the properties of moist air using the psychrometric chart.			TBD--Elective			BS MET	
		Plot an air conditioning process on a psychrometric chart.							
		Identify and understand the operation of several types o air conditioning systems.							
		Determine building loads and operational requirements.							
		Calculate heating and cooling loads both manually and using computer programs.							
		Design and size an air distribution system.							
		Select and size water piping for chilled water, hot water and steam systems.							
		Select and size pumps, fans and blowers using performance charts.							
		Analyze the thermodynamics of the vapor compression cycle for refrigeration.							
		Determine the heat transfer rates and the coefficient of performance of a heat pump and a cooling system.							
		Determine the efficiency of a heating system.							
		Select the best refrigerant based on properties.							
		Design and present a complete air conditioning system for a small building as a semester project.							
MET 374	A study of the principles and practices of selling technica products and/or services. The course covers product knowledge, buying motives, the ten phases of a sale, ethical and legal aspects, in-company promotion of new products, and career opportunities in technical sales. Utilizes role playing	Understand the concepts of selling and the elements of a career in sales.			TBD--Elective			BS MET	
		Understand the ten steps in the sales process.							
		Know the elements of marketing and the importance of marketing and personal selling to an industrial organization.							
		Understand the social, ethical and legal aspects of sales.							
		Explain the difference between features, advantages and benefits and know why benefits is the most important factor in the buying decision.							
		Understand Maslow's hierarchy of needs and why people buy.							
		Understand the elements of verbal and non-verbal communication and know the importance of non-verbal signals.							
		Improve listening skills and the usage of questions.							
		Know what kinds of sales knowledge are required in selling technical products.							
		Understand the concepts of value, markup and return on investment.							
		Describe prospecting methods and understand how to plan a sales call based on the prospect's five mental steps in buying.							
		Understand the various methods of making a sales presentation and how to select the best approach.							
		Recognize the various personality types of prospects and how to tailor the presentation to each.							
		Understand the various questioning techniques and which ones to use in particular situations.							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Understand the sales presentation mix and how to utilize each element.							
		Use a trial close to elicit objections and be able to respond to various kinds of objections.							
		Explain when to close a sale and utilize various closing techniques.							
		Understand the concept of customer service and how to build customer retention and account penetration.							
		Understand the concept of time and territory management and the need to determine the salesperson's breakeven point in sales volume.							
		Apply the principles of salespersonship to resume preparation and the seeking of employment.							
		Utilize role play to provide experience in making a sales presentation.							
MET 384	Introduction to the basic concepts and terminology of instruments. Procedures and techniques essential to industrial measurement and transmission of data. Emphasis on pressure, flow, temperature, and level measurements, and computer control.	Understand the objectives of taking measurements and the importance of correct interpretation of the results.	1a,b,c,d,e,2a,2c,2d,2e,3,4a,4c		TBD--Elective			BSMET	
		Understand how static and dynamic measurements differ, how each should be taken, and the importance of calibration of the measuring device.							
		Know the standard units of measurement in both English and SI systems, and how to express values in the appropriate number of significant digits.							
		Understand the concept of total error as made up of bias and precision error, and how this is related to the true error using the concept of measurement uncertainty.							
		Understand how errors arise in common measurement systems due to both equipment and human sources.							
		Calculate measurement uncertainty using statistical principles for both small and large samples, and understand how uncertainty can be propagated.							
		Fit the best straight line through a series of data points and evaluate the goodness of fit.							
		Understand the basic response characteristics of dynami measurement systems.							
		Understand how resistance and Hall effect transducers function.							
		Measure stress and strain in materials and combine strain gages in Wheatstone bridge and rosette arrangements to obtain mechanical measurements.							
		Understand the principles of measuring forces and torques.							
		Take pressure measurements in both static and dynamic systems and calibrate pressure measuring devices.							
		Take fluid flow measurements and calibrate flowmeters. Understand the concept of hysteresis in flow calibration.							
		Take temperature measurements, calibrate such devices, and select the correct device for a particular situation.							
		Evaluate errors in temperature measurements due to hea transfer effects.							
		Understand the characteristics of sound, measure sound pressure level and intensity, and calculate the attenuatio of sound with distance.							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
		Understand the theory of PID control from a physical standpoint and apply the theory to both PLC's and PC's in the laboratory.							
		Set PID control parameters to effect desired responses in mechanical systems.							
		Perform laboratory experiments in teams with proper procedures and prepare laboratory reports in a concise and effective manner.							
IET 104	By the end of the class, the student should have an overall understanding of not only how a typical manufacturing company operates, but how to contribute to making the operation more efficient and more productive for the future.	To learn generic functions of all facets of a manufacturing organization including financial, marketing, human resources, quality, material flow, manufacturing cost control, manufacturing systems, engineering, and the manufacturing environment.	1b,1d		Business Plan Semester Project	All students achieve 80% or better	No, 78% of students met 80% or better criteria (one group didn't complete project)	AS/BS MET/CIMT	Implemented New Text, Established On-line links to supplemental resources, Established industry evaluations of business plan project with awards to student groups, Revised criteria and outline for business plan sectional requirements
		Apply learning to business plan development of student's choice. Application will develop throughout the entire course as development for final project.	1a,1e,2c,2e						
		Upon completion of a course, a student should be able to assess all aspects of an organization.	4a						
IET 150	By the end of the class, the student should be able to apply statistical techniques to typical problems in technology. Topics include: data collection, descriptive statistics calculation, hypothesis testing, sampling, continuous and discrete distribution, probability, ANOVA and related topics. This course also introduces the student to the use of spreadsheet and other statistical software.	Ability to graphically summarize data	1a		Final exam	All students achieve 80% or better	Yes	AS/BS MET/CIMT	Implemented New Text (based on student evaluations), Established course for complete On-Line delivery. Implemented mid-semester evaluations for feedback on course. Implemented Excel labs with course for application purposes (based on industry requirements)
		Calculate means, medians, modes	1d						
		Calculate variance and standard deviation statistics	1d						
		Know the difference between population and sample statistics and parameters	1b,d						
		Know when to use and be apply to apply discrete distribution	1b,d						
		Know when to use and be apply to apply continuous distributions	1b,d						
		Know when to use Student's t distribution and Chi square distribution	1b,d						
		Be able to work in a group, analyze a case, organize the data, draw conclusions with appropriate statistical application, and present to a group of peers.	1a,1c,2d,4a						
IET 350	Examines the concepts and techniques of analysis useful in evaluating the worth of systems, products, and services in relation to their cost. The objective is to help the students grasp the significance of the economic aspects of engineering and to become proficient in the evaluation of engineering proposals in terms of worth and cost. Project analysis will require computer proficiency.	Master the ability to use the accounting equation to develop balance sheets, income statements and appropriate performance ratios based upon a variety of financial journal entries			Graduation Exam	70% correct on graduation exam	No	AS/BS MET/CIMT	Developed for on-line delivery. Introduced SWOT analysis to project list. Developed powerpoint slides to accompany text. Performed DOE on factors affecting retention on graduation exam.
		Ability to analyze personal financial investments and financial priorities							
		Understand interest calculations and compounding of interest							
		Understand annuities, gradients and time value of money							
		Understand the methodology behind continuous financial improvement and the cost of quality							
		Understand the variety of ways to calculate return on investment for different projects and situations							
		Demonstrate sound judgement in engineering project decision making based upon time value of money calculations							

Course	General Course Objective	Measurable Outcomes	Related PULs	Related ABET a-k	Method of Assessment	Goal	Goal Met?	Degree Program	Changes Made in 2002-2003
MET 211	The principles of Strength, stiffness, and stability are introduced and applied primarily to mechanical components.	Apply the principles of statics to determine the forces acting on load carrying members.		a,c,e,f,k					
		Identify and calculate direct and shear stresses using P/A		a,c,e,f,k					
		Be able to convert between stress to strain and calculate the associated parameters: Young's Modulus, Poisson's ratio, and Shear modulus		a,c,e,f,k					
		Calculate elongation of axially loaded members: both statically determinate and statically indeterminate systems		a,c,e,f,k					
		Determine maximum stress in problems containing stress concentrations.		a,c,e,f,k					
		Calculate shear stress and angle of twist in torsionally loaded circular shafts		a,c,e,f,k					
		Be able to construct Shear and Moment diagrams		a,c,e,f,k					
		Determine bending stresses in transversly loaded beams.		a,c,e,f,k					
		Calcuate deflections in transversely loaded beams		a,c,e,f,k					
		Be able to calculate the critical buckling load in short and long columns.		a,c,e,f,k					
		Determine stresses in parts that experience combined loading		a,c,e,f,k					
		Be able to convert measured strain values into stress		a,b,d,e,f,g,k					
		Be able to smooth experimental data using the least squares curve fitting technique		a,b,d,e,f,g,k					
		Be able to convert measured deflections into stress.		a,b,d,e,f,g,k					

DEPARTMENT OF ORGANIZATIONAL LEADERSHIP AND SUPERVISION 2003 ASSESSMENT REPORT PREPARED BY STAFF

Draft: 23 May 2003

Associated PULs	**Methods used to assess the desire behaviors**	**Assessment findings (baseline)**	**Improvements (changes) put into place based on assessment baseline findings**	**Assessment findings (current)**	**Impact of changes that were put in place**
2e -- Critical Thinking, Use knowledge and understanding in order to generate and explore new questions.	Case Study titled, "The Wilderness Training Lab". Students were asked to analyze the case during the mid-term test.	Fall 2002: Assessment data revealed that during Fall semester 2002 only 8 students out of 23 or 34.8% successful identified and explained the irony in the case. The goal was for all 18 students to be able to identify and explain the irony involved in the case titled, "The Wilderness Training Lab". –(goal not met)	The improvements were achieved by presenting information on Argyris' theory in a slightly similar case with a review of the concept prior to having the students analyze the case.	Spring 2003: 12 out of 18 students or 66.6% reached the stated goal. The goal was not met. There was an improvement of approximately 34 percentage points over the previous semester.	The goal will continue to be set at 100% of the students in the class. The professor will use another case to analyze. This case will contain an irony (hidden within the case) but very different to one on the test. Hopefully the student will become aware of the possibility that irony may be found within cases and this awareness will result in a more circumspect analysis.
4. Intellectual Depth, Breadth, and Adaptiveness *Specific competency:* Demonstrate understanding about life in a foreign culture. Match textbook concepts to information gained during interviews with a cultural informant and from outside sources. 5. Understanding Society and Culture *Specific competency:* Use textbook models to explain how the selected culture differs from one's own culture. Express insights into one's own cultural values and beliefs as	Term paper	Spring 2002: 75% of students demonstrated competence with specified PULs. Fall 2002: 71% of students demonstrated competence. Goal: 90% of students demonstrate minimum competence with specified PULs.	After spring 2002: Changed the assignment specifications. Added information to the assignment description. Provided an example of an effective thesis statement. Pointed out the specific page numbers of key textbook information. After fall 2002: Required a draft of the thesis statement 3 weeks prior to the due date.	Spring 2003: 87.5% of students demonstrated competence with specified PULs.	Preliminary analysis suggests that changes in the assignment description had little impact. However, the requirement that students submit a draft of the thesis statement may have had a significant impact.

compared to those of a foreign culture.					