PURDUE SCHOOL OF ENGINEERING AND TECHNOLOGY 2006 ASSESSMENT REPORT

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

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July25, 2006

Introduction

The Purdue School of Engineering and Technology, IUPUI (E&T) continues its tradition of reporting its outcomes assessment activities department by department. As in the past, different departments are at different stages of maturity in their processes. At one extreme, some of the departments' reports are very complete and report historical information from prior years, while at the other extreme, others newer to the process present only current year assessment or only a narrative of their current progress in defining their outcomes assessment processes.

In prior years, the campus asked department to report on 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

If you are interested in reading reports for 2004 year and earlier, please log on to http://www.planning.iupui.edu/43.html and scroll down to "School Assessment Reports." Then click the year of interest.

Starting in 2003, the campus asked that departments submit only the following information:

- Assessment methods used
- Changes made
- Impact of changes

However, several departments have chosen to submit the new information and some of the old information in order to paint a more complete picture of their outcomes assessment processes.

This year, in addition to department assessment reports, we include our report to the IUPUI campus on "Assessing General Education Outcomes in the Disciplines." This report is a brief summary of each the work done of each academic department and academic program during 2005-2006 in assessing student learning and using the results to make changes in their respective curricula to improve student learning.

The E&T 2005-2006 Assessment Committee

The school's assessment committee has been very active since its inception in the fall semester of 1996. Under the guidance of Charles Yokomoto, Professor of Electrical and Computer Engineering, the committee has met monthly. This is the last year that Dr. Yokomoto will have served as chair. Starting with the 2006-2007 academic year, Elaine Cooney, Professor of Electrical and Computer Engineering Technology, will chair the committee. The members of the 2005-2006 committee were the following:

Hasan Akay, Mechanical Engineering
Karen Alfrey, Biomedical Engineering
Tim Diemer, Organizational Leadership and Supervision
Russ Eberhart, Electrical and Computer Engineering
Eugenia Fernandez, Computer and Information Technology
Becky Fetterling, Technical Communications
Laura Lucas, Construction Technology
Emily McLaughlin, Design Technology
Janet Meyer, Freshman Engineering
Armando Pellerano, Mechanical Engineering Technology
Kenneth Reid, Electrical and Computer Engineering Technology
Kenneth Rennels, Dean's Office
Rich Pfile, Electrical and Computer Engineering Technology
Charles Yokomoto, Assessment Committee Chair, Electrical and Computer Engineering
H. Öner Yurtseven, Dean

Assessment Process Variations in the School's Departments

Taken from our School's 2002 annual report and updated in 2004 and again in 2006, Table 1 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 or the IUPUI Principles of Undergraduate Learning (PUL). Two of the departments have developed their assessment programs around 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).

Engineering and technology faculty write Program Outcomes and assess student learning in these outcomes for our professional accreditation. The Program Outcomes for engineering programs and technology outcomes are similar to each other, but they are not the same, and they map quite well into IUPUI's PULs. Rather than developing a complex outcomes assessment process where both the ABET outcomes and PUL outcomes are assessed, the ABET directed departments have chosen a strategy of assessing their ABET Program Outcomes and demonstrating through a relational matrix that they cover 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 engineering 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.

Table 1. Characterization of Departmental Assessment Processes.

DEPARTMENT	BASIS	PRIMARY STRATEGY	SUPPLEMENTAL SOURCES OF ASSESSMENT DATA
Computer and Information Technology (CIT)	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
Design Technology (DST)	ABET/CIDA	Assess actual learning in all course taught by full-time faculty and selected courses taught by associate faculty. Each course is assigned one or more of the program's outcomes for assessment, and, utilizes assessment done in service courses for all courses required in the plan of study.	Student self reports of how 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 Industry trend/need input
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 and Computer Engineering Technology (ECET)	ABET/TAC	Assess how well students feel they have learned the course objectives/ outcomes using surveys	Continuing students satisfaction Senior capstone project 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

Departmental and Program Annual Reports for 2006

The 2006 departmental and program assessment reports included in this school report represent the collected works of the following:

Biomedical Engineering (BME)
Computer and Information Technology (CIT)
Construction Technology (CNT)
Design Technology (DT)
Electrical and Computer Engineering (ECE)
Electrical and Computer Engineering Technology (ECET)
Freshman Engineering
Mechanical Engineering (ME)
Organizational Leadership and Supervision (OLS)
Technical Communications (TCM)

TABLE 2. PULS COVERED BY ABET/EAC CRITERION 3 FOR ENGINEERING PROGRAMS

Updated With Wording From the ABET 2005-2006 Criteria

3 = strong linkage, 2 = moderate linkage, 1 = mild linkage	PULs COVERED BY THE ABET/EAC a-k																				
	PUL 1					PUL 2					PUL 3			PUL 4			PUL 5			PUL 6	
ABET/EAC CRITERIA 3 Engineering programs must demonstrate that their students attain:	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 within the realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability						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, economic, environmental, 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							

TABLE 3. PULS COVERED BY ABET/TAC CRITERION 2 FOR ENGINEERING TECHNOLOGY PROGRAMS

Updated With Wording From the ABET 2005-2006 Criteria

ABET OUTCOMES ***TAC CRITERION 2—PROGRAM OUTCOMES*** An engineering technology program must demonstrate that graduates have:	**PRINCIPLES OF UNDERGRADUATE LEARNING ADDRESSED**																					
	PUL 1 Core Communication and Quantitative Skills					**PUL 2** Critical Thinking					**PUL 3** Integration and Application of Knowledge			**PUL 4** Intellectual Depth, Breadth, and Adaptiveness			**PUL 5** Understand Society and Culture			**PUL 6** 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 appropriate mastery of the knowledge, techniques, skills and modern tools of their discipline				*	*							*		*							
(b) an ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology						*	*		*	*			*	*		*					
(c) an ability to conduct, analyze and interpret experiments and apply experimental results to improve processes		*				*		*		*				*							
(d) an ability to apply creativity in the design of systems, components or processes appropriate to program objectives							*		*				*	*		*					*
(e) an ability to function effectively on teams			*																*		
(f) an ability to identify, analyze and solve technical problems		*		*		*	*	*	*					*		*					
(g) an ability to communicate effectively	*		*								*								*		
(h) a recognition of the need for, and an ability to engage in lifelong learning		*			*		*														
(i) an ability to understand professional, ethical and societal responsibilities						*						*						*		*	
(j) a respect for diversity and a knowledge of contemporary professional, societal and global issues										*		*	*		*		*	*	*	*	
(k) a commitment to quality, timeliness and continuous improvement					*					*	*					*				*	

ASSESSING GENERAL EDUCATION OUTCOMES IN E&T—ICHE REPORT
Prepared for the Indiana Commission on Higher Education
Purdue School of Engineering and Technology
June 1, 2006

Department or Program	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
a. Biomedical Engineering	The first BS degrees are planned to be awarded in May of 2008. In the coming year, additional course outcomes will be specified, and the draft of our Program Outcomes and Objectives will be presented to our constituents and revised based on their input.	The success of the program will have the following assessment components: 1. Student learning through student works, including homework, laboratory, and exam performance; 2. Industry's satisfaction with our graduates using surveys and focus groups; 3. Alumni satisfaction using surveys and focus groups; and 4. Matriculation rates, graduation rates, job placement, graduate school admissions, and advancements. Because we do not yet have any graduates, at present (1) is being used as our primary assessment tool, supplemented with student feedback on their experiences in our new BME courses and university/peer feedback from a September, 2005 department review directed by Chancellor Banta's office.	Laboratory exercises for BME 222 (Biomeasurements) are being retooled this summer Based on student performance and feedback, Student performance on final exam in BME 241 (Biomechanics) is being mapped to course outcomes and used to direct changes to lectures. Relevant results from the BME department review: • The recommendation to *infuse entrepreneurship into BME courses* will shape some of the topics covered in our capstone design course, the outcomes of which will be drafted this fall; • The recommendation to *clarify elective course offerings* has led to the drafting of a general electives list; proposal of depth areas with relevant coursework; and, currently in progress, the development of a more comprehensive approved technical electives list; • The recommendation for *improved allocation of space* will eventually lead to an increase and consolidation in a centralized area of department laboratory and teaching space; and • The recommendation to *increase diversity hiring* (especially female) has influenced our search and screen activities this year and will continue to do so.

Department or Program	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
b. Computer and Information Technology	We have created a general information page for each course that includes the ABET IT Outcomes, which are mapped to the course objectives. Each of the ABET IT Outcomes is mapped onto the PULs. The objectives, ABET IT Outcomes, and PULs are also listed in the syllabi for each course.	• Assignments, tests, lab reports, project reports and presentations, final exams in courses • Internship and project reports • Student satisfaction surveys • Student exit surveys • Alumni surveys • Employer surveys • Industrial Advisory Board appraisals	We are starting an across the curriculum program with increased emphasis on oral and written communication skills. We have standardized the specific UML tools to be taught in all systems analysis and design courses.
c. Construction Technology	Each course syllabus contains the learning goals which are linked to both the PULs and our Program Outcomes for ABET accreditation.	Formative and Summative measures used in both Courses and for the Dept overall review 1. Mid-semester stop/start/cont surveys 2. Individual and group projects 3. Capstone project presentations 4. Laboratory reports 5. Final exams 6. Student satisfaction surveys 7. Senior exit interviews 8. Dept Committee Meetings 9. Peer Reviews 10. Employer surveys 11. Industrial Advisory Board discussions	Most of the changes made were programmatic and implemented thru out the department, in an effort to spread successful efforts to more courses and thus cover more students. • Faculty meetings generated need to revise and reinforce pre-requisites. • Senior exit interviews and student surveys have led to some additional training for some faculty, reassignment of faculty among courses, variations in the course offerings and time of day of offerings. • Teaching Method changes have included more case studies, real life examples and lab experiences to aid integration of course content to industry applications. • Content changes have resulted from Advisory Board discussions concerning current usage and relevance of course content especially in terms of technology.

Department or Program	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
d. Design Technology	Syllabi for each course (and each of its sections) specify at least one PUL and one ABET program outcome. Instructors are charged with assessing any PUL and ABET program outcome noted for a given course, reporting the findings and recommending actions for course improvement. At least one course is identified to assess each PUL and ABET program outcome.	1. Homework assignments, lab reports, projects and presentations, final exams in courses 2. Capstone project reports 3. Student satisfaction surveys 4. Student exit surveys 5. Alumni surveys 6. Employer surveys 7. Industrial Advisory Board appraisals 8. Faculty end-of-semester reflections 9. Internship reports done by graduates of the AS program that are now pursuing a BS degree We have mapped these onto the IUPUI Principles of Undergraduate Learning to show that all PULs are thus assessed and have found patterns that indicate students are meeting or exceeding our expectations. We continue to refine the connection between work items and measurable outcomes to better substantiate this data.	Design Technology split off from Construction Technology in January 2006. Although all full and part time faculty are educated in and involved in the collection of work items and outcomes data, we are not getting the participation of enough faculty for dependable and consistent data collection every semester. These courses assess almost all of our accreditation-based program outcomes and we think will prove to be good indicators of student learning as we stabilize the administrative groups of both areas. A renewed focus on the assessment data collection process has been initiated and should prove to be beneficial.

Department or Program	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
e. Electrical and Computer Engineering	Our learning goals are embedded in our assessment of our Program Outcomes for ABET accreditation. Each of the Program Outcomes is mapped onto the PULs.	a. Capstone project reports b. Laboratory reports c. Final exams d. Hourly exams e. Student satisfaction surveys f. Alumni surveys g. Employer surveys h. Industrial Advisory Board appraisals i. Oral presentations j. Term papers/project reports	There are three types of improvements that are made in the ECE department. The first type is related to individual courses, the second type is related to the curriculum, and the third type is related to operations. First type--changes in individual courses, recommended or planned, based on assessment data or instructor's reflections: • ECE 201: more information on applications is needed • ECE 266: include more content related to RAM/ROM applications • ECE 301: incorporate Matlab & Maple in homework problems to help students learn the principles • ECE 400: a unit on safety and standards was added based on feedback from an accreditation visit. • ECE 401: Based on previous semester assessment of quality of submitted work, more instructions on research assignment H-2 and project H-5 were given. Also added another assignment on models of right and wrong, the lowest scoring section of the course on the final exam. Second type--changes in the curriculum: • Matlab was moved from the freshman year to the sophomore year to reduce the gap between the time that student learn it and apply it in ECE 202. • An operating systems course was added to our required list of computer engineering courses because of feedback from our accreditation visit. Third type--changes in operations of the department: • A professional student advisor was hired to improve student satisfaction with advising. • A formal exit interview process for graduating seniors was started. • Tutoring services have been expanded based on feedback from our continuing students survey. • Computers and software have been upgraded in all teaching labs based on feedback from our continuing students survey. • A limited, required student advising program has been put in place to improve advising.

Department or Program	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
f. Electrical and Computer Engineering Technology	Our learning goals are embedded in our assessment of our Program Outcomes for ABET accreditation. Each of the Program Outcomes is mapped onto the PULs.	1. Reports assessed using rubrics: • Course project reports (written & oral) • Capstone project reports (written & oral) • Research reports • Formal laboratory reports 2. Design & build project (assessed using rubrics) 3. Final exam questions targeted to specific objectives 4. Student satisfaction survey 5. Student & faculty course objective surveys. 6. Industrial Advisory Board appraisals	Every semester, course coordinators are required to review all assessment data and propose changes to each course as indicated. In addition to changes in individual courses, the following changes were made that affected the curriculum as a whole: 1 Per Industrial Advisory Board (IAB) ECET 257, Power and RF Electronics, was dropped from curriculum and replaced with ECET 284, Computer Communications 2 Because of a gap in assessment data, ECET 499, Ethics and Professionalism, was added as a required course. 3 Per student satisfaction surveys, laboratory computers were upgraded. 4 Per IAB suggestion for more formal training in project management, a required text was added to the senior project course sequence. 5 Per IAB suggestions, new hardware was procured and implemented in ECET 302, Introduction to Control Systems. 6 Per IAB suggestions, Linux is now used in a few upper division courses.
g. Freshman Engineering	The learning community course is built on the University template and learning objectives are mapped to PULs. In all freshman courses, objectives are mapped both to ABET criteria and PULs. The Freshman Engineering Program is a service unit for the other engineering departments. Program goals encompass adjustment to college life and mastery of strategies for student success as well as preparation for advanced courses in the engineering curriculum.	1. Hourly and final exams. 2. Student satisfaction surveys. 3. Oral presentations. 4. Course outcome surveys. 5. Peer evaluations. 6. Project reports. 7. Project assessment survey	Curricular changes are made in response to assessment findings from the engineering departments as well as results of assessment of the freshman courses. Results from course outcome surveys, project report evaluations, and peer evaluations have produced changes in project design, instruction of teamwork, and teaching methods for software tools. • As a result of student assessment changes in the Freshman Engineering curriculum are being implemented in Fall 2006. One component previously taught of two of the ENGR courses will instead be taught later in the curriculum as a separate one credit hour course ENGR 297. This change is in response to both student and departmental feedback. • Freshman engineering implemented a “hands-on” project component in all ENGR 196 sections.

Department or Program	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
h. Mechanical Engineering	Our learning goals are embedded in our assessment of our Program Outcomes for accreditation by the Accreditation Board of Engineering and Technology (ABET). Each of the Program Outcomes is mapped onto the PULs. The correspondence maps, relating our program outcomes to PULs, prepared jointly with the ECE department, are depicted at our assessment web site from http://www.engr.iupui.edu/me/fpuls.shtml. The department has received a full re-accreditation of its mechanical engineering degree till 2011 from the engineering and technology accreditation body, ABET. With the assessment measures that are in place, we are continuously monitoring the effectiveness of the curriculum established in Fall 2003.	• Capstone design project reports • Laboratory reports • Final exams • Hourly exams • Term papers/project reports • Oral presentations and jury evaluations • Student satisfaction surveys • Alumni surveys • Employer surveys • Course outcomes surveys • Exit surveys • Faculty feedback mechanism • Industrial Advisory Board appraisals Student Advisory Board appraisals	• The exit surveys showed that the expected improvements in the fall 2003 curriculum are mostly being met, with the exception of the outcomes of the new statistics course. Measures are planned to address this finding. • The student satisfaction survey results led to: 1 Implementation of a team report writing format in experimental labs, giving more time to students in conducting the experiments and interpreting the results. A peer evaluation mechanism is added to the grading of the reports. 2 More tutoring sessions have been instituted for lower level courses in the curriculum. 3 More emphasis has been placed upon coop, internship, and job placement services. • Jury evaluation of capstone design projects led to: 1 More emphasis on impact statement requirements in the design presentations and reports (impact of the design on society, safety, environment, etc.) 2 More use of project management tools, such as Microsoft Project, in design projects. • Course outcomes surveys led to: 1 Addition of formal recitation hours in key sophomore level courses for solving more examples. 2 Revision of the lab experiments in ECE/ME 340 course. 3 Emphasis on solving more examples in the class. 4 Addition of design of experiments components to selected experiments in experimental lab courses.
i. Mechanical Engineering Technology	No report has been submitted to the School's assessment committee.		

Department or Program	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
j. Organizational Leadership and Supervision	Syllabi for every section of every course specify at least one PUL item. Every instructor is charged with evaluating student performance in at least one PUL item in each class. All instructors, including part time instructors, are asked to complete assessment reports at the end of each semester. The instructor's assessment report describes the method used to measure PUL performance and the results.	1. Course assignments, exams, projects, term papers. 2. Community involvement activities. 3. Student surveys. 4. Alumni surveys. 5. Industrial Advisory Board appraisals. The analysis of the progression of PUL skill building at the 200, 300, and 400- level for OLS course offerings is based on the Assessment Measures. Each of the changes in the next column directly correlates to existing assessment findings.	From student performance in OLS 410 and the Capstone Course (OLS 490): • Created Graduation Requirement of attaining a C or better in all required OLS core course. • Added Project Management Course (OLS 371) and a research writing component (TCM 320) to the OLS Degree Program Plan of Study to prepare students for the high degree of assessment demonstrated in OLS 410 and 490. • We required students to submit a 1-2 page Executive Summary for *Manager's Bookshelf* each week, resulting in improved in-class discussions. • In-class essay-based test on *Practical Research* text concepts were given, resulting in 100% of the class earning a C or higher on the test. • *Practical Research* application exercises are now integrated into group-based strategy project, resulting in improved quantity and quality of investigation methods used, analyses conducted, and sources cited. • The course now requires an in-class essay-based test on *Strategy* text concepts, resulting in 100% of the class earning a C or higher on the test and a group-based project and paper demonstrates application of knowledge of *Strategy* text concepts, resulting in more robust information retrieval, analyses, interpretation, and forecasting of strategic leadership principles • OLS hired a teaching assistant to help students with project components and required more frequent drafts of writing submissions earlier in the semester, resulting in over 80% of students completing OLS 490 in the semester in which initially enrolled.

Department or Program	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
Organizational Leadership and Supervision (continued)			From the assessment of OLS 252 final exams: ▪ OLS will require a mid-semester assignment where students must "comprehend, interpret, and analyze" information from a wide range of textbook chapters to prepare students better for the final exam, as was done successfully in OLS 274. ▪ Students in online classes who live outside the area now receive a video version of the on-campus orientation, resulting from data that show that those who do not attend the on-campus orientation do not do as well. ▪ Some "Real Player" lectures and presentations are converted into Java script format, and new procedures require students to test video compatibility before signing up for online classes. This is based on feedback from students. • Additional use of video, guest speakers, and role play to dramatize the challenges of cross-cultural communication. • An additional decision making model (PISCO Decision Making Model) was introduced, along with the assessment rubric created for this assignment to improve performance on developing a personal ethics plan (PUL 6) From discussion forums and surveys of employers and former OLS majors: • Upgraded department position, conducted search and screen and hired professional to manage department administrative duties, student faculty communication, and advising. • Add Project Management to curriculum to prepare OLS students for project leadership roles.

Department or Program	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
Organizational Leadership and Supervision (continued)			Based on feedback from current and prospective students the department: • Increased access to web-based learning and communication as indicated by students. • Implementation of a designated course coordinator using the full-time faculty to guarantee consistent assessment and application of PULs appropriate for required courses in the OLS Major with multiple sections. • Additional use of video, guest speakers, and role play to dramatize the challenges of cross-cultural communication. From OLS 274: • Survival Guides" (ten questions drawn from 16 chapters) were assigned weekly. End of semester study guide was developed from the Survival Guides. The result was that student performance on final exam was better than predicted. "Survival Guide" approach will be used in OLS 252 classes as well. • A series of low-stakes writing assignments was introduced in OLS 274 to prepare students for capstone writing assignments in OLS 410 and OLS 490. This was done based on feedback of students being unprepared for 410 and 490 project report writing. • We required weekly chapter quizzes were developed for OnCourse in OLS 274 and OLS 252 based on students being unprepared for classroom discussion.

Department or Program	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
k. Technical Communications	Technical Communications does not have majors. The program assesses oral presentations and written reports for the departments in the school.	1. Oral presentations for engineering majors 2. Written reports for lower level technology majors 3. Oral presentations for upper-level technology majors	TCM has done some self-evaluation and reflection on the assessment tools and techniques used for our program, resulting in the following: • For the engineering students, we have reworked the assessment tool used by the outside jurors for the oral presentations, making the form and categories simpler for jurors to use. • For technology students, we continue to educate our adjunct faculty about the importance of consistent assessment and the results of our efforts as part of our strategy for improvement. • We have improved our formal rubric for assessing written work and have distributed it to our faculty. • As part of this effort, we have also revised the tool for written artifacts for clarity and conciseness. • We have reinitiated observations of both tapes and of live presentations in the upper level oral practicum class for technology students. We are currently looking at curricular changes that may need to be made to stay current with the demands of the modern workplace.

DEPARTMENT OF BIOMEDICAL ENGINEERING 2006 ASSESSMENT REPORT

Written By Karen Alfrey

May, 2006

The Biomedical Engineering (BME) Program was formally established on our campus with the initiation of the MS and PhD degrees in 1996. Our formal degree request to the Higher Education Commission for an undergraduate degree in BME was approved in the Spring of 2004. Our goal was to establish a new Department of Biomedical which would continue to have 12 full time faculty members who will support a BS through PhD degree suite and whose research mission will primarily coincide with the current programs in the School of Medicine.

Our goals have been to evolve the BME Program into a new Department of Biomedical Engineering and to begin offering a new BS level degree in Biomedical Engineering, in addition to the MS and joint PhD degrees. The first BS degrees are planned to be awarded in May of 2008. With respect to the new BS degree, it will be developed in a way which will allow for eventual accreditation by the Accreditation Board for Engineering and Technology (ABET).

Learning Goals for Majors that Encompass PULs are Specified

The first BS degrees are planned to be awarded in May of 2008. Some of the first steps in meeting the ABET were taken this year, including the establishment of an External Advisory Board, the drafting of our Program Outcomes and Objectives, and the establishment of Course Outcomes for our junior level courses. In the coming year, additional course outcomes will be specified, and the draft of our Program Outcomes and Objectives will be presented to our constituents and revised based on their input.

Multiple Assessment Measures are in Place

The success of the program will have the following assessment components:

1. Student learning through student works, including homework, laboratory, and exam performance;
2. Industry's satisfaction with our graduates using surveys and focus groups;
3. Alumni satisfaction using surveys and focus groups; and
4. Matriculation rates, graduation rates, job placement, graduate school admissions, and advancements.

Because we do not yet have any graduates, at present (1) is being used as our primary assessment tool, supplemented with student feedback on their experiences in our new BME courses and university/peer feedback from a September, 2005 department review directed by Chancellor Banta's office.

Assessment Findings are Used

Based on student performance and feedback, laboratory exercises for BME 222 (Biomeasurements) are being retooled this summer.

Student performance on final exam in BME 241 (Biomechanics) is being mapped to course outcomes and used to direct changes to lectures.

Relevant results from the BME department review:

The recommendation to *infuse entrepreneurship into BME courses* will shape some of the topics covered in our capstone design course, the outcomes of which will be drafted this fall;
The recommendation to *clarify elective course offerings* has led to the drafting of a general electives list; proposal of depth areas with relevant coursework; and, currently in progress, the development of a more comprehensive approved technical electives list;
The recommendation for *improved allocation of space* will eventually lead to an increase and consolidation in a centralized area of department laboratory and teaching space; and
The recommendation to *increase diversity hiring* (especially female) has influenced our search and screen activities this year and will continue to do so.

DEPARTMENT OF COMPUTER & INFORMATION TECHNOLOGY 2006 ASSESSMENT REPORT
Prepared by Eugenia Fernandez
Oct. 15, 2006

1. **What general outcome are you seeking?**	2. **How would you know it** (the outcome) **if you saw it?** (What will the student know or be able to do?)	3. **How will you help students learn it?** (in class or out of class)	4. **How could you measure each of the desired behaviors listed in column 2?**	5. **What are the assessment findings?**	6. **What improvements have been made based on assessment findings?**
ABET IT Outcome (a) Use and apply current technical concepts and practices in the core information technologies	Explain and correctly use information technology terminology Effectively manage files under DOS & Unix Create static & dynamic web sites Explain and apply data management concepts.	Lecture, readings, exercises, labs, quizzes & exams	Assessed in CIT 140, CIT 214, CIT 286 and CIT 212 using quizzes and exams Assessed in CIT 286 using lab exercise	Over 80% of all students in CIT 140 and 286 scored over 75% on the exam or lab. Students are learning the concepts covered in these two classes (first two listed in column 2). Overall, only 58% of students in CIT 212 and 214 scored over 75% on the quizzes and exams.	The following changes have been made to CIT 212 and 214 over the last 3 semesters: ▪ Introduced collaborative work groups ▪ Posted archived lectures for student review ▪ Online discussion forums for student questions ▪ Teaching assistant added As none of these seem to have made a difference, we are now convening a faculty group to investigate further and propose improvements.

ABET IT Outcome (b) Analyze, identify and define the requirements that must be satisfied to address problems or opportunities faced by organizations or individuals	Plan a Web site to effectively meet client needs. Create a logical data model.	Lecture, readings, exercises, and projects	Assessed in CIT 212 using a planning assignment Assessed in CIT 214 using an assignment on logical modeling.	73% of the students in CIT 212 scored over 75% on the assignment. Only 61% of the students in CIT 214 scored over 75% on the logical data modeling assignment.	See above note.
ABET IT Outcome (c) Design effective and usable IT-based solutions and integrate them into the user environment	Create well designed object oriented programs Design and implement a web site Create a database and successfully access the data	Lecture, readings, exercises, and projects	Assessed in CIT 140 and 270 through programming assignments. Assessed in CIT 212 via the final project. Assessed in CIT 214 via assignments	91% of the students in CIT 140 scored over 75% on their program assignment. 95% of the students in CIT 212 scored over 75% on their final project. Only 51% of the students in CIT 214 scored over 75% on their database assignments. Only 50% of the students in CIT 270 scored over 75% on their programming assignment.	See note above.

ABET IT Outcome (g) Demonstrate an understanding of best practices and standards and their application	Explain basic object-oriented terms	Lecture, readings, exercises, programs, quizzes & exams	Assessed in CIT 270 via a quiz	Only 44% of the students scored over 709% on the quiz.	See note above.
ABET IT Outcome (h) Demonstrate independent critical thinking and problem solving skills	Solve problems by writing a computer program.	Lecture, readings, exercises, programs, quizzes & exams	Assessed in CIT 270 via programs.	Only 61% of the students scored over 75% on the program.	See note above.

DEPARTMENT OF CONSTRUCTION TECHNOLOGY 2006 ASSESSMENT REP0ORT

Prepared by Laura Lucas

July 2006

Introduction

The department has developed a continuous improvement plan that is sustainable over the long term, provides timely feedback on strengths and weaknesses in the program, demonstrates that the department meets the ABET a-k program outcomes, and is not overly burdensome to busy faculty members.

The core of this plan is the philosophy that involvement leads to improvements both philosophically and quantifiably…that making all courses and all faculty somewhat responsible will increase awareness of the scholarship of teaching and learning by both faculty and students. Spreading out the responsibilities also allows for redundancies and checks-and-balances between full time and part time faculty and provides for a wide range of work items, teaching methods and implemented improvements. Having everyone involved in continuous improvement leads to full participation in curriculum development and assessment meetings.

Continuous Improvement Plan and Related Documentation

Figure 11. Overview of Continuous Improvement Process

OVERVIEW : CNT ASSESSMENT PROCESS

The role of the Department, faculty and students is to work together to understand the process of assessment and participate in the goal of documenting any improvements in student learning. The Construction Technology Department's role is to establish the methodology of assessment and to provide the necessary guidance to all faculty towards each course meeting the PUL and ABET goals for improving student learning. The faculty gather the data from scored (graded or otherwise evaluated) work from their courses and incorporate any improvements (generated from this data) into their courses. The students participate by providing the work or survey data that is assessed.

Teach, Practice, Test and Improve- This process underscores the basic assessment axiom that the instruction process is essential to improving student learning. Students learn best by completing this cycle and having the opportunity to use faculty feedback to improve their understanding of the knowledge and skills they are learning. Assessment data should come from subject matter that is adequately taught, practiced with faculty input, tested as to retention and then evaluated with feedback given so misunderstandings are not repeated.

Clear and useful instructional objectives and evaluative feedback are as important as telling the students what they are learning and why they need to learn it. Students are expected to learn from the evaluation (i.e. scoring) of their work, and be able to apply what they learned (either in this course, the next course or in work-related situations).

Collecting Data, Samples and Refining Measurement Activities is a cooperative effort between the faculty and the department. As data is collected for each course, (and gathered to document the overall effort), the ideas from faculty for improvements in each course should result in refinement of measurement activities for all courses. As a baseline, this department measured course grades, then as a refinement measure we have begun to identify specific work for assessment activity so as to better pinpoint and target improvements to instructional objectives and scoring rubrics.

Developing and Incorporating Improvements in the classroom is the ultimate goal of collecting data from student work and the part most crucial to improving student learning. Improving student learning is a continual looping process of incorporating feedback for the faculty and the department. Perhaps another work item would better indicate the student learning for the chosen outcome, or maybe this work item would better measure a different course objective and thus another program outcome. The department and instructor will work together for the continual improvement of process and work products to improve student learning.

Criterion #2 program outcomes	ABET / TAC- Program Outcomes (early careeer) at time of graduation for Students	ART 117	ART 120	ART 155	ART 165	ART 210	ART222	ART 284	ART 285	CET 104	CET 160	CET 260	CET 267	CET 275	CET 312	CET 350	CET 430	CET 452	CNT 105	CNT 110	CNT 280	CNT 302	CNT 330	CNT 341	CNT 342	CNT 347	CNT 390	CNT 447	CNT 452
A	Demonstrate an appropriate **mastery** of the knowledge, techniques, skills and modern tools **of their discipline.**		X																					X	X			X	
B	**Apply current knowledge** and adapt to emerging applications in mathematics, science, engineering and technology.			X	X			X	X					X			X			X	X		X						
C	**Conduct, analyze and interpret experiments** and apply experimental results to **improve processes.**									X			X		X					X									
D	**Apply Creativity** in the design of system, components or processes appropriate to program objectives															X	X												
E	Function effectively on **teams (team member development)**									X					X													X	
F	Identify, analyze and **solve technical problems.**	X									X	X				X		X											
G	**Communicate effectively**	X		X			X														X					X	X		
H	Recognize the need for and possess the ability to pursue **lifelong learning.**					X													X										
I	Understand professional, ethical and **societal responsibilities.**					X																X							X
J	Recognize contemporary professional, **societal and global issues** and be aware of and respect diversity (**Be cognizant)**																		X									X	
K	Have a commitment to **quality, timeliness** and continuous **improvement**		X																				X	X	X				

ABET Program criteria Criterion #8	(first two years of courses)for CNT BS	ART 117	ART 165	ART 284	ART 285	CET 104	CET 160	CET 260	CET 267	CET 275	CNT 105	CNT 110	CNT 280		
a	utilizing modern insturment, methods and techniques to implement construction contracts, documents and codes	x			x					x	x				
b	evaluating materials and methods for construction projects		x										x		
c	utilizing modern surveying methods for construction layout					x									
d	Determining forces and stresses in elementary structural systems						x	x							
e	Estimating material quantities and costs for technical projects	x	x	x									x		
f	Employing productivity software to solve technical problems	x				x				x	x	x			
ABET Program criteria Criterion #8	**(third and fourth years courses) for CNT BS**	CET 312	CET 350	CET 430	CET 452	CNT302	CNT 330	CNT 341	CNT 342	CNT 347	CNT 390	CNT 447	CNT 452	CNT 470	CNT 494
BS-a	Producing and utilizing design, construction and operation documents									x	x	x			
BS-b	Performing economic analysis and cost estimates related to design, construction and maintenance of systems in the construction technical specialties						x		x						x
BS-c	Selecting appropriate construction materials and practices		x				x						x		
BS-d	Applying principles of construction law and ethics					x									
BS-e	Applying basic techincal concepts to the solution of construction problems involving hydraulics and hydrology, geotechnics, structures, construction scheduling and management and construction safety		x	x	x		x	x				x		x	
BS-f	Performing standard analysis and design at least one recongizable technical specialty within construction engineering technology that is appropriate to the goals of the program.	x		x								x			

Assessment of Courses to ABET criteria #8

Constituencies of the Program

The constituencies of the CNT program are:

1. CNT students and potential students
2. CNT faculty
3. Potential and current employers of CNT students

4. Alumni
5. Industrial Advisory Board
6. School (E&T) and University (IUPUI)
7. The national engineering technology community

Our Assessment and Accreditation Committee considered our constituencies in developing and reviewing the program objectives and outcomes, and to provide feedback in implementing our continuous improvement plan. The school and university were considered in establishing the vision and mission of the department. The following provides a brief description of the feedback received from our constituents: The above constituencies and their means of feedback to the program are further summarized in Figure 12.

Students- Feedback from students is received regularly every semester through course evaluations, students' satisfaction survey, and seniors' exit interviews and course outcomes surveys in some courses. Appendix B3a-a provides a summary of the findings and all the data will be displayed for the team visit.

Faculty- Faculty regularly receives feedback from students, other faculty, and the chairman and industry representatives. Students provide end of semester student evaluations and surveys, other faculty provide discussions in committee and department meetings about individual courses and program issues such as sequencing and content appropriateness, and the Chairman regularly reviews faculty performance and continuing education with annual reviews. Also, they receive peer feedback during the end-of-semester reflections meetings and departmental retreats.

Employers- Employers of our students are surveyed by the Dean's Office staff. The results of these surveys are summarized in Appendix B3a-b and all the data will be displayed for the team visit.

Alumni--Past graduates of our program are surveyed periodically by the Dean's Office staff. The school is developing a plan to survey alumni at two-year intervals. The results of the recently conducted survey are summarized in Appendix B3a-c and all the data will be displayed for the team visit.

Industrial Advisory Board. The advisory board for the department has been in place for several years with several long standing members and many occasional members. It is under new leadership with the new chairman and currently consists of 26 members representing local industry (See Figure 28). The board meets one to two times a year and provides feedback to the department about curriculum, industry trends and local employer needs. The membership provides good coverage of the industry sectors including heavy civil, commercial, residential, and industrial companies. The current advisory board has been grouped into three subcommittees with specific tasks to more strongly and more directly support the growth and influence of CNT graduates in the local construction industry: 1) Curriculum, 2) Research, and 3) Special Projects (image and Promotions). These subcommittees will meet regularly and report to the whole assembly bi-annually. The advisory board has been instrumental in advising the department in curriculum matters and providing student placement opportunities. Some board members serve also as instructors/guest speakers/jury members during capstone presentations. The meeting minutes will be displayed for the team visits.

The School and University. The department's activities are disseminated thru presentations and annual departmental assessment reports to school assessment committee. The department's annual assessment reports to the school are provided in Appendix B1-a

The National Engineering Technology Community. A number of the faculty members are active in educational assessment. They are active in both attending and presenting at engineering and the scholarship of teaching and learning conferences. Their attendance and participation at these national conferences influences both our reputation as well as provides needed feedback on the scholarship of teaching and learning at our school relative to the national community. (See Appendix B3a-d) Additional Copies of some recent papers written on the scholarship of teaching and learning will be displayed for the team visit.

Figure 12. Primary Constituencies with Means of Interaction and Feedback.

Primary Constituencies	Means of Feedback
Students	• Course evaluations (each semester) • Course outcomes surveys (some courses) • Midterm survey (Start, Stop and Continue) • Exit Survey and Interview • Student Organizations
Faculty	• Course Assessment Checklist (each semester) • End of semester reflection • Midterm Surveys (Start, stop, Continue) • Department & Committee Meetings • Departmental Retreats • CNT 390 Work Experience Reports
Industrial Advisory Board	• Board meetings of the committee as a whole • Discipline sub-group meetings • IAB Surveys
Alumni	• Alumni Survey
Employers	• Employer Survey • Internship and Co-op reflections and surveys

Processes Used to Establish and Review Program Objectives and Outcomes

The assessment committee and the full department review the program objectives and program outcomes, regularly. Recommended changes are brought up to the entire faculty for discussion. At the end of each semester, the faculty as a whole review assessment data collected and discuss changes that faculty members or coordinators believe will improve courses the following semester. Individual faculty institute changes and record the results of those changes and then they share the findings with others (other faculty, committees or departments).

Methodology for Continuous Evaluation and Improvement of the Program

The department has developed several tools for continuous evaluation and improvement of the program as described below.

Figure 13. Definition of major surveys/forms used for assessment.

Terms	Definitions
Student Course Learning Objectives Surveys (some faculty some courses)	Surveys conducted at the end of each semester on course objectives measuring the student self-assessment of the degree of competency achieved in each course objective (related to program outcomes). These surveys are independent of the school wide course/instructor evaluations
Faculty Course Learning Objectives Survey (some faculty some courses)	An evaluation completed by the instructor on course objectives evaluating student's competency achieved in each course objective (related to program outcomes).
Students Satisfaction Survey	Survey conducted to measure the student satisfaction on matters related to the quality of teaching, courses, labs, advising, services, resources, and learning environment.
Alumni Survey	Survey given to recent alumni (who graduated within the last five years) to measure their satisfaction of the knowledge and skills they have gained in the CNT program
Employers Survey	Survey given to employers to measure their satisfaction of the skills and knowledge of our recent alumni (going seven years back)
Assessment Checklist	Form developed to document both the process and the data collection from individual courses
End of Semester Reflection	Survey and or discussions among all full-time and some part-time faculty members at the end of every semester. These reflections are bases on the Continuous Improvement/ Assessment Checklist form used by the Dept.
Course Assessment artifacts or work items	Evaluation of student's learning via evaluation of student work as collected in most individual courses

The assessment tools could be grouped in direct and indirect categories. The direct tools include:

1. Employers survey for measuring effectiveness of the program outcomes in the work force.
1. Feedback forms for course outcomes survey results completed and submitted at the end of each semester by the faculty teaching the courses.
2. Jury evaluations in key courses that involve formal presentations in front of an audience of faculty and industry guests.
3. Instructor's assessment of student performance based on student work items. Course outcomes surveys are independent of the instructor's evaluation.
4. End of Semester reflection meeting to discuss: students meeting course objectives; assignment results; comments on textbook or course notes; course challenges; anything new tried in a course; laboratories support; students' informal comments, software performance and updates. A copy of the minutes of end of semester reflection meeting is in Appendix B3a-e.

The indirect tools include:

1. Course learning outcomes surveys are conducted in some courses at the end of each semester through students' self-assessment of their competency achieved in each course objective.
2. Exit surveys on program outcomes conducted at the time of graduation to obtain self-assessment of the graduates on how well the program outcomes are met. A copy of the exit survey as given to the students is in Appendix B3a-f.
3. Annual student satisfaction survey conducted annually to determine student satisfaction with the program. Appendix B3a-g includes a copy of the survey questions.
4. Student Advisory Board that provides input on student satisfaction and needs.
5. Alumni survey for measuring the impact of program outcomes in the performance of graduates.

Timing and Frequency of Assessment Activities

The parties responsible for continuous improvement data collection as well as the collection frequency are shown in Figure 14 (next page).

Evidence of Continuous Improvement

Evaluation of assessment data is an ongoing process based on the instructor's completion of the assessment checklist to document efforts to meet program outcomes as manifested in course learning objectives. Program outcomes are mapped to program objectives so that as outcomes are achieved then objectives can also be evaluated. Every year the data from individual courses is collected and analyzed and reported in the Department Annual Assessment report, changes are made to the overall effort as a result of these reports, i.e. course assignment to outcomes could be modified, or outcomes to objectives redirected to simplify data collection efforts. Within courses, changes are also implemented, tested and then whether deemed successful or not, shared with other faculty.

Figure 14. Continuous Improvement and Evaluation Responsibilities

	Assessment Tool	Responsible Party	Frequency
1	Assessment Checklist & Student Work Items	Course Instructor/Coordinator Chair, Assessment Committee	Every fall and spring semester,
	Assessment Annual Report	Chair, Assessment Committee	Once a year,
2	Student Course Evaluations	Course Instructor/Coordinator Department Chair	Every fall and spring semester,
3	Student Course/Learning Outcomes Survey	Course Instructor/Coordinator some courses	Every fall and spring semester,
	Faculty Course Outcomes Survey	Course Instructor/Coordinator some courses	Every fall and spring semester,
4	Exit Survey and Interview	Department Chair	Every fall and spring semester

5	Student Satisfaction Survey	Chair, Assessment Committee Chair, CNT Department	Once per year
6	End of Semester Reflection	Course Instructor/Coordinator all Chair, CNT Department All Full time Faculty	Every fall and spring semester
7	Course Assessment Reflection (Appendix B3a-h)	Course Instructor/Coordinator Chair, CNT Department All Full time Faculty	Every fall and spring semester, (newly instigated)
8	Alumni Survey	Dean's Office	Once every two years
9	Employer Survey	Dean's Office	Once every two years
10	Advisory Boards	Departmental and Dean's Office	At least once a year

The results of this periodic evaluation of student learning of outcomes and objectives are prepared by the Chair of the Assessment Committee, reviewed by Department Chair and discussed by and with faculty to develop ideas for further improvements. Although the annual assessment report shows achievement of goals, closer review of the data shows the changing make up of the data, in terms of courses, faculty and work items. With the widespread collection of data from many courses, even when the overall result is success, individual course data can also be reviewed for changes year to year. Most of the years, overall goals for student learning of course objectives are achieved thus leading to program outcomes and program objectives, but not always by the same courses and not always with the same results within the course itself. Further inspection and reflection on yearly changes within a course and the impact of any previous changes is usually done yearly. Instructors are encouraged to share ideas for improvements as well as sharing of the impact of the changes. (See annual assessment reports in Appendix B2-a)

The effectiveness of the program can be shown to be improving based on the increasing number of faculty involved and the increasing quantity of courses involved. Changes implemented and then judged by the faculty as improving learning are often adopted in other courses. "Best practices" such as rubrics are shared between similar courses. Review of the improvements listing from the assessment checklist (in the "Assessment Mad simple" shows the repetitive use of certain methodologies or techniques from one course or instructor to another.

The following highlights describe the ongoing evaluation of the assessment data for program objectives and outcomes; summarize the results from this periodic evaluation and shows that the results are being used to improve the effectiveness of the program.

1. To educate ourselves on assessment principles, and the scholarship of teaching and learning faculty members attend conferences and share their knowledge when they return. Professors Laura Lucas and Daphene Koch attended an ABET Faculty Workshop for Program Improvement in October 2002. Prof. Lucas has served as the departmental representative to the school assessment committee, and is chaired the accreditation and assessment committees. Professor Lucas presented an overview of the department assessment process titled "Selecting a Primary Source of Assessment Data" at the Assessment Institute in 2004 and 2005. A full listing of seminars and workshops etc is found in Section B5.e.1

2. Additionally, Prof. Sener as previous Department Chair served on the University Program Review and Assessment Committee (PRAC) during 2002 and 2003 and also chaired the Grants sub-committee of PRAC charged with awarding grants for assessment work on the IUPUI Campus. Prof Sener also served on the School of ET Assessment Committee during the time he was Chair, 1997-2004. Prof... L. Lucas joined the School Assessment Committee serving together with Prof. Sener in 1999. She developed the assessment checklist form that documented the process for course assessment data collection, (which has been adapted for use by several other school departments). She was awarded a PRAC grant for the formalization of the checklist in the pamphlet titled "Assessment made Simple" in 2001.

3. The Department Assessment Committee, working closely with the department faculty and other department constituents to develop the original early career program objectives in fall 2002. These objectives were revised in Fall/Winter 2004 with minor modifications made in wording was made in March 2005 to improve the assessment terminology. The program objectives were reviewed by the industrial advisory committee in fall 2005, with no changes recommended. The industrial advisory committee was asked to rank the relative importance of each of the objectives in spring 2005 for all CNT and ART related programs. The department's student organizations leadership also was asked to review the program objectives in spring 2005 and had no recommendations for changes.

4. The departmental program outcomes were initially written in fall 2003. The program outcomes were reviewed and by the department's industrial advisory committee in spring 2004. The committee recommended only a minor wording change but had questions regarding teaching and assessing teamwork as well as differentiating the difference of the skill levels of AS and BS graduates. These were revised in fall 2005 to further differentiate the outcomes to the individual degree programs. The original program outcomes were expanded to eleven. The original program outcomes covered all of the ABET a-k outcomes, but in several cases multiple ABET a-k outcomes were contained in one of the program outcomes. For example both written and oral communications from ABET a-k were mapped into one of our program outcomes. When collecting assessment data, the multiple mappings made it somewhat confusing to determine which ABET outcomes was being met, so we rewrote the outcomes to better align with ABET a-k. Breaking down our program outcomes to match ABET a-k helped us to simplify the assessment progress by giving us a one-for-one relationship with ABET outcomes and we could more readily show evidence that we were assessing ABET a-k.

5. Constituencies of the program were identified in fall 2002 during a meeting with the faculty as a whole. This was updated in fall 2005 Assessment and Curriculum Committee meetings.

6. The department's first assessment plan was written for the ABET review process conducted in 2000/01. The plan was last revised in fall 2005 and has been modified over the course of the past months to reflect the new administrative alignments and course improvements that have taken place during this time.

7. A continuous improvement form (called the Assessment Checklist) was published in 2001 to make it easier for faculty to understand and conform to the continuous improvement needs of the department. Faculty uses it to record and attach information such as syllabus, rubrics and student work as well as student learning data.

8. The End of Semester Reflection sessions were introduced in 2005 as a part of the assessment process for a more coordinated review of areas needing improvement and implementing such changes with overall faculty input, rather than just in individual courses.

9. An exit survey had developed in fall 2004 to receive feedback from graduating senior students in the CNT BS program to help assess program outcomes. This survey, conducted at the end of each semester, is used as one of the information sources for assessment of our program outcomes.

10. A student satisfaction survey, designed to receive feedback from students on overall quality of the program annually has been administered starting in spring 2004. Previous surveys were conducted, but not on a routine basis. The intent is to now use this survey every spring semester. The survey results are analyzed and reviewed at the End of Semester Reflection meeting held in the spring. This form is included and analysis of its findings is included in Appendix B3a-h.

11. Student input is often sought by faculty sponsors of the student organizations on a formal basis and informally in conversations with individual students. Their feedback has been sought for general advice on many topics such as course scheduling and laboratories as well as to act as a focus group to provide further clarification on departmental survey areas where the department needs to look at improvement. Their input is reported back by faculty sponsors. Student meeting Minutes in will be displayed for the team visits.

12. Surveys of graduates are taken approximately six months after graduation. This survey started in 1986 and was significantly revised in December 2004. A sample of the survey is provided for the team visit. These surveys are administered at the University and School level.

13. In fall of 2004, the department looked into the effectiveness of the industrial advisory meetings and discovered that in larger groups meeting when course specifics were discussed members outside of the discipline had little to add to the conversation. We decided to implement small subgroup meetings with advisory committee members, instructors teaching courses related to the subgroup and the department chair.

Assessing General Education Outcomes in the Disciplines

TABLE I

School (with Majors)	Learning Goals for Majors that Encompass PULs are Specified	Multiple Assessment Measures are in Place	Assessment Findings are Used (What Changes Have You Made During the Reporting Year?)
Construction Technology	Each course syllabus lists and faculty explain the learning goals which are linked to both PULs and the assessment of our Program Outcomes for ABET accreditation.	Formative and Summative measures used in both Courses and for the Dept overall review 1. Annual Report: assessment checklist and student work items 2. Student Course Evaluations 3. Student/Course Learning Outcomes Survey Faculty Course Outcomes Survey 4. Exit Survey and Interview 5. Student satisfaction surveys 6. End of Semester Reflections 7. Course Continuous Improvement Reports 8. Alumni Surveys 9. Employer surveys 10. Industrial Advisory Board discussions See attached: Summary of Improvements from Assessment Instruments	Most of the Changes made were programmatic and implemented thru out the department, in an effort to spread successful efforts to more courses and thus more students. Faculty Meetings generated need to revise and reinforce pre-requisites. Senior exit interviews and student surveys have led to some additional training for some faculty, reassignment of faculty among courses, variations in the course offerings and time of day of offerings. Teaching Method changes have included more case studies, real life examples and lab experiences to aid integration of course content to industry applications. Some of these are documented on the course continuous improvement Report Content changes have resulted from Advisory Board discussions concerning current usage and relevance of course content especially in terms of technology. Continuous Assessment efforts at the course level will be documented with a new form (Course CI Report) which emphasizes changes and impacts in the classroom See attached template: Course Continuous Improvement Report

Summary of Improvements per Assessment Instruments

1	Assessment Checklist & Student Work Items Assessment Annual Report	Increases awareness of departmental expectations of individual courses and faculty and allows for in depth review of work items within individual courses	a. All faculty have exposure to assessment and continuous improvement, b. Targets where more data needs to be collected i.e. part timers c. Targets courses that don't met goals for more in-depth review d. Pinpoints courses that are too successful at meeting goals i.e. grade inflation or mastery learning e. Provides overview for reallocation of courses to program outcomes i.e. better fit for instructor or work items
2	Student Course Evaluations	Increases faculty and chair connection to student impressions and viewpoint on individual courses and instructors	a. Standardized for university and school so not as specific as needed b. Not directly related to program outcomes c. More about the course than the instructor's methods or student learning
3	Student Course/Learning Outcomes Survey Faculty Course Outcomes Survey	Provides faculty and student knowledge / perceptions on the direct relationship between student learning and course objectives	a. Provides quantifiable data by asking student if they think they have learned the course objectives b. Allows for comparison between faculty and student perceptions of student learning
4	Exit Survey and Interview	Gives chairman direct knowledge and access to student issues like placement and dept strengths and weaknesses	a. Very specific to CNT issues b. Provides current information, no wait on Univ. survey results and analysis c. Interview techniques adds in depth answers to survey questionnaires and allows interactive questioning
5	Student Satisfaction Survey	Allows students to feel their opinions are valued and considered throughout the school	a. Not tied directly to program objectives nor to program outcomes b. Good overview of student satisfaction with global issues
6	End of Semester Reflection	Improves coordination and integration between courses and faculty	a. Improved integration of student learning across courses b. Pre-requisites and overlaps of course objective easily recognized and dealt with c. Best practices easily and readily shared i.e. rubrics d. Common complaints and concerns reviewed and resolved in a timely manner
7	Course Continuous Improvement Report	Better documentation of course for tracking continuous improvements	a. Information easily shared with new or part time faculty b. Course by course information isolated and more in-depth

8	Alumni Survey	Allows contact with and opinions of alumni to be known	a. Few respondents for CNT b. Long turn around for data from University levels
9	Employer Survey	Allows contact with and opinions of employers to be known	a. Few respondents for CNT b. Long turn around for data from University levels
10	Advisory Boards	Generates current industry needs and trends	a. CNT Board provides timely and construction specific feedback b. Curriculum can be made to respond to employer feedback

Course Continuous Improvement Report

Course [ ] -Taught by [ ] during [ ] .
Course name and number *instructor name* semester/year

Methodology: Changes/improvements have been implemented based on faculty observations, faculty scholarship of teaching and learning, student surveys both formative and summative as well as trends uncovered by analysis of previous year data. Although all changes cannot be directly tied to improvements in student learning, all changes have impacts on student learning. These impacts are then observed and modified as needed to suit the situations and thus completing the continuous improvement loop for each course. Completing this form each semester serves to document the process of change for this course for future review and discussion.

Continuing Course Involvement/role in Departmental Assessment Activities

Current assessment was of TAC-ABET Criteria A, B, C, D, E, F, G, H, I, J, K *(Circle the criteria as listed on your syllabus- max. of two per course)*	*(Provide Reason for continuing to assess the criteria indicated at left or if provide suggestions for changing criteria)* *(If recommending a criteria change indicate new criteria here)* A, B, C, D, E, F, G, H, I, J, K

Specific Changes implemented this semester have included the following:

(Mark and/or add the changes implemented in this course and then add course specific comments per change/impact as necessary)

X	Changes Implemented:	Generalized Impact of changes	Add Course specific comments here
	Adjusted grade categories i.e. More weight on problems, essays, homework, projects etc	Student work efforts better reflect course objectives	
	Spent time reviewing/ integrating topics throughout the semester	Better retainage for cumulative final, and or higher level thinking by students	
	Added interactive, active learning assignments in and out of class	Increased student participation and engagement	
	Modified/standardized assignment info	Better consistency of student work more attention to problem solving than setting up the problem	
	Increased use of technology i.e. OnCourse to distribute and collect information	Better consistency of student work more attention to answering the questions	
	Increased field trips, lab work, guest speakers	Increased student participation and engagement	
	Reduced or increased quantity of graded homework problems, essays, problem sets, projects etc	Learning focused more on course objectives, more in-depth learning on specific content	
	Add topics to curriculum, better review of prerequisite materials	Better retainage/understanding of new course concepts	
	Conducted formative assessment i.e. stop/start/continue surveys	Up-to-date adjustments to student learning styles, pacing, knowledge etc	

	before the halfway point of the semester		
	Incorporated industry input to course content, examples etc	Increased student job readiness for local industry	
	Changed course delivery i.e. textbook, created coursepak more handouts, less handouts	Added more current information, students use technology- based communications	

Use back of \form to indicate information that occurred which is not on this list. *Mark this box if information is on back of this form* ☐.

DESIGN TECHNOLOGY PROGRAM 2006 ASSESSMENT REPORT
Written by Emily McLaughlin
June 2006

Learning Goals for Majors

Syllabi for each course (and each of its sections) specify at least one PUL and one ABET/CIDA program outcome. Instructors are charged with assessing any PUL and ABET/CIDA program outcome noted for a given course, reporting the findings and recommending actions for course improvement. At least one course is identified to assess each PUL and ABET/CIDA program outcome.

Assessment Measures

The following kinds of evidence are used in our assessment process.

1. Homework assignments, lab reports, projects and presentations, final exams in courses
2. Capstone project reports
3. Student satisfaction surveys
4. Student exit surveys
5. Alumni surveys
6. Employer surveys
7. Industrial Advisory Board appraisals
8. Faculty end-of-semester reflections
9. Internship reports done by graduates of the AS program that are now pursuing a BS degree

We have mapped these onto the IUPUI Principles of Undergraduate Learning to show that all PULs are thus assessed and have found patterns that indicate students are meeting or exceeding our expectations. We continue to refine the connection between work items and measurable outcomes to better substantiate this data.

Assessment Findings and Changes Made

Design Technology split off from Construction Technology in January 2006. Although all full and part time faculty are educated in and involved in the collection of work items and outcomes data, we are not getting the participation of enough faculty for dependable and consistent data collection every semester. These courses assess almost all of our accreditation-based program outcomes and we think will prove to be good indicators of student learning as we stabilize the administrative groups of both areas. A renewed focus on the assessment data collection process has been initiated and should prove to be beneficial.

ELECTRICAL AND COMPUTER ENGINEERING 2006 PRAC REPORT
Prepared by Charlie Yokomoto
July 2006

1.0 Introduction

This year, the ECE Department has changed the format of its report on the assessment of student learning. Instead of the tables that were used in previous years, we have chosen to present our findings and proposed modifications of the teaching/learning process in narrative form.

In our assessment process, four kinds of data are collected and analyzed in the ECE department. They are the following:

- Feedback from alumni using a survey that asked them how well they were educated in our program with respect to a list of nineteen learning outcomes that was developed by our school assessment committee. The survey also asked our alumni to rate the importance of each of the learning outcomes to their employment.
- Feedback from employers on a survey that asked them how well our graduates are performing on a list of six Program Educational Objectives that the department developed for our professional accreditation process. The survey also asked to rate the importance of each of the PEOs to their companies.
- Direct assessment of student learning through the assessment of student works such as exams and project reports. This method of assessment is performed in a select set of courses.
- Indirect assessment of student learning through a survey of students' confidence in how well they have mastered the course outcomes, which are linked to the accreditation Program Outcomes (PO).

The format of this report departs from the reports submitted in previous years and is not as comprehensive as those reports. This report consists primarily of assessment data, findings, and planned improvements. For more complete information on program outcomes, measurable outcomes, courses where the outcomes are taught, and how the outcomes are measured, please refer to our 2003-2004 or 2004-2005 reports at http://www.planning.iupui.edu/64.html#06.

2.0 Feedback from Our Alumni

Our alumni survey consisted of nineteen items that were common across all departments in the School of Engineering and Technology. The items represented a combination of our ABET Program Outcomes and the IUPUI Principles of Undergraduate Learning. Each item is liked to our ABET Program Outcomes and to our ABET Educational Objectives. Our alumni were asked to rate the **importance** of each item in the workplace and how well they were **prepared** in their degree programs on a five point scale (5 = best).

The results of the computer engineering alumni survey that was administered in the 2005-2006 academic year is shown in Table 1 (n = 30). Table 1 also presents data from our 2003-2004 combined survey of electrical engineering and computer engineering alumni (n = 31). Data from that alumni survey was not separated by major. Results for our electrical engineering alumni were very similar to the computer engineering results and are omitted to save space. Only data on importance from the 2005-2006 survey is shown. The right-most column shows the change in scores from the 2003-2004 survey to the 2004-2005 survey. An analysis of the data follows Table 1.

Table 1. 2003-2004 and 2005-2006 CmpE Alumni Survey Results Survey
(PO = ABET Program Outcome; PEO = ABET Program Educational Objective)

		2005-2006		2003-2004	
	Item--Computer Engineering Alumni	Importance* Average	Preparation** Average	Preparation** Average	Increase
1	Ability to continuously learn new skills and knowledge. (PO l, PEO 4)	4.87	4.70	3.97	0.73
2	Ability to work successfully as a member of a team. (PO d, PEO 4)	4.87	4.50	3.59	0.91
3	Ability to communicate effectively orally. (PO g1, PEO 4)	4.83	4.00	3.66	0.34
4	Ability to take initiative. (PO d, PEO 4)	4.80	4.00	3.52	0.48
5	Ability to plan, organize, and complete a design task. (PO c, PEO 3)	4.77	4.23	3.83	0.40
6	Ability to consider several points of view and arrive at a reasoned conclusion. (PO d, PEO 4)	4.73	4.33	3.59	0.74
7	Ability to communicate effectively in writing. 9PO g2, PEO 4)	4.70	3.97	3.55	0.42
8	Ability to use information resources such as databases, libraries, and the Internet. (PO k, l, PEO 4)	4.70	4.47	3.62	0.85
9	Understanding and appreciation of ethics and professionalism as related to your work. (PO f, PEO 4, 5)	4.57	4.47	3.9	0.57
10	Ability to evaluate the quality and validity of data, information, and evidence. (PO b, PEO 3)	4.50	4.13	3.68	0.45
11	Awareness of value of considering diversity and differences in cultures in your work. (PO h, PEO 4)	4.50	4.43	3.48	0.95
12	Ability to solve engineering problems using methods, tools, and skills of your discipline. (PO k, PEO 2)	4.47	4.27	3.97	0.30
13	Awareness of the impact of your work in a global context. (PO h, PEO 5)	4.43	3.83	2.9	0.93
14	Awareness of the importance of safety issues related to your work. PO c, PEO 3)	4.23	3.63	2.93	0.70
15	Ability to integrate mathematics and science into your work. (PO a, PEO 1)	4.20	4.43	4.07	0.36
16	Ability to apply the basic principles of your discipline. (PO a, PEO 1)	4.07	4.27	3.79	0.48
17	Ability to design and conduct an experiment. (PO c, PEO 3)	3.77	4.20	3.46	0.74
18	Knowledge and abilities in the state of the art in your discipline. (PO h, PEO 5)	3.73	4.00	3.52	0.48
19	Ability to integrate knowledge from the humanities and the social sciences into your work. PO a, k, PEO 2)	3.73	3.83	3.45	0.38

* Importance: 5 = very important, 4 = important, 3 = somewhat important, 2 = of little important, 1 = not important.
**Preparation: 5 = very good, 4 = good, 3 = adequate, 2 = marginal, 1 = poor.

2.1 Analysis of the Data

The items in Table 1 are sorted on the basis of the reported **importance** of each of the items to their career progress. We used 4.00 (on a 1 to 5 scale) as the threshold at which an item become important enough to students in the workplace and 3.75 as the threshold on the preparation scale below which the department needs focus on improvements. Then from the 2005-2006 data in Table 1, we find that only item 14, related to safety aspects, scored above 4.0 on importance and below 3.75 on performance, and

even though this item scored below 3.75 on performance, the improvement from the 2003-2004 survey is 0.70, a fairly sizeable increase. We focused our attention on this item in closing the loop.

2.2 Using the Results of the School's Alumni Survey (Closing the Loop)

The department has been actively holding discussions during monthly department meetings and at special meetings to discuss the findings from our various sources of assessment data. To address the first item, safety issues related to their work, our required senior capstone design course, ECE 492, now contains a unit on safety, and the guidelines for writing the final capstone design report ask for a section on the safety aspects of the design.

2.3 Demonstrating Improved Alumni 2005-2006 Performance compared with the 2003-2004 Data

Note that the average for **each** item in the 2005-2006 preparation column is higher than the preparation average for the 2003-2004 column. The increase is shown in the last column under the heading "Increase."

- The minimum increase is 0.30, from 3.97 to 4.27, on item 12 on "the ability to integrate mathematics and science into your work." This is on a 1-to-5 scale.
- The maximum increase is 0.93 on item 13, from 2.90 to 3.83, on "the awareness of the impact of your work in a global context."
- The average increase is 0.59.

3.0 Feedback and Findings from Our Survey of Employers

In our survey of employers, we collected two kinds of data. The first used a global question that asked for supervisors for an over-all impression of the quality of our graduates. The second asked for an evaluation of the importance of each of our six Program Educational Objectives (PEO) and how our graduates have performed on them.

Table 2 presents the results of the first question, showing the combined results (n = 17), the results for CmpE graduates (n = 3), and the results for EE graduates (n = 14). These numbers represent the returns of 122 EE graduates who completed their degrees between 2000 and 2004 and 35 CmpE graduates who completed their degrees between 2002 and 2004.

Table 2. Employers' Overall Impression of the Quality of Our Graduates

	Combined CmpE and EE (n = 17)	CmpE (n = 3)	EE (n = 14)
Overall impression of the quality of IUPUI graduates	4.71	4.67	4.71

Table 3 presents the results of our employers' evaluations of the importance of each of our PEOs and how well our graduates are able to perform the behaviors described by each of them for all CmpE and EE graduates. We present this set of data first because of the small number of CmpE reports. The results for CmpE graduates are shown in Table 4. For the sake of consistency with the process used for the alumni surveys, the results in Table 3 sorted the employer feedback on the basis of importance of each of the six items to the responding employers.

We used 4.00/5.00 as the threshold at which a PEO becomes important to employers and 3.75/5.00 as department's desired employer average evaluation of the performance of our alumni. Then from Table 3, each of the PEOs meets or surpasses the 4.0 level of importance, and student performance on each PEO surpasses the desired 3.75 performance rating. PEO #5 (4.06/5.00) on the ability to incorporate knowledge from outside the technical content of the discipline into their professional work received the lowest performance rating, which is consistent with the feedback we received from our alumni. Thus in the next section, we discuss closing the loop on this item.

Table 3: Results from Our Survey of EE and CmpE Employers (n = 17)

PEO	Item--Combined EE and CmpE Employer Feedback	Importance Average*	Performance Average**
4	Strong professional attributes. This include the demonstration of ethical behaviors in the workpalce, lifelong learning skills, oral and written communication skills , and the ability to work succesffully on interdisciplinary teams.	5.00	4.41
3	Competence in completing engineering tasks succesfully. This may include the ability to do engineering design, to design and perform experiments and product testing, and to solve engineering problems.	4.94	4.59
1	A foundation in the mathematics and sciences, a sound knowledge of electrical or computer engineering fundamentals, and the ability to apply these to solving real-world problems.	4.88	4.29
6	An ability to be a successful practitioner of electrical and computer engineering.	4.81	4.31
2	Competence in the use of the modern tools of the discipline and in the application of current technical knowledge and skills.	4.76	4.41
5	An ability to incorporate knowledge from outside the technical content of the discipline into their professional work. This may include knowledge of contemporary issues and the impact of their work on a global, societal, and environmental context.	4.06	4.06

The results in Table 4 are not sorted on the basis of importance but remain in the same order as Table 3 for direct comparison. The data in Tables 3 and 4 are very similar, with all survey items demonstrating the consistency between the feedback that we received on our CmpE and EE graduates.

3.1 Using the Results of the Employer Survey (Closing the Loop)

The faculty of the ECE Department has begun discussions on issues related to PEO #5, particularly with regard to our Program Outcome (h), the broad education necessary to understand the impact of engineering solutions in a global and societal context. As part of this discussion, the CmpE curriculum committee has made a commitment to incorporate instruction and assignments that address PEO 5 and PO (h) in courses that satisfy the Advanced CmpE Electives section of the CmpE Plan of Study. Students are required to take two courses from the five approved electives that satisfy this requirement.

Further discussions will continue in the department in conjunction with the department's long range planning to incorporate new ideas from the National Academy of Engineering's publication, "The Engineer of 2020."

Table 4. Results from Our Survey of CmpE Employers (n = 3)

PEO	Item--CmpE Employer Feedback (n = 3)	Importance* Average	Performance** Average
4	Strong professional attributes. This include the demonstration of ethical behaviors in the workpalce, lifelong learning skills, oral and written communication skills , and the ability to work succesffully on interdisciplinary teams.	5..00	4.33
3	may include the ability to do engineering design, to design and perform experiments and product testing, and to solve engineering problems.	4.67	4.00
1	A foundation in the mathematics and sciences, a sound knowledge of electrical or computer engineering fundamentals, and the ability to apply these to solving real-world problems.	4.67	4.33
6	An ability to be a successful practitioner of electrical and computer engineering.	4.67	4.33
2	Competence in the use of the modern tools of the discipline and in the application of current technical knowledge and skills.	5.00	4.67
5	An ability to incorporate knowledge from outside the technical content of the discipline into their professional work. This may include knowledge of contemporary issues and the impact of their work on a global, societal, and environmental context.	4.67	4.33

* Importance: 5 = very important, 4 = important, 3 = somewhat important, 2 = of little importance, 1 = not important.

**Performance: 5 = very good, 4 = good, 3 = adequate, 2 = marginal, 1 = poor.

4.0 Direct Assessment of Student Learning

During this cycle of the assessment of student learning in the ECE Department, we report on the assessment of student learning in the following areas:

- Teamwork (Program Outcome d), Section 4.1
- Solving Engineering Problems (Program Outcome e), Section 4.2
- Ethics and Professionalism (Program Outcome f), Section 4.3
- Workplace Oral Presentations (Program Outcome g1), Section 4.4
- Global Impact (Program Outcome h), Section 4.5
- Life-long Learning (Program Outcome i), Section 4.6
- Contemporary Issues (Program Outcome j), Section 4.7

During the next assessment cycle, data will be collected on the assessment of the following outcomes:

- Using Mathematics and Engineering Science (Program Outcome a1)
- Using Science in Engineering (Program Outcome a2)
- Designing and Conducting Experiments (Program Outcome b1)
- Analyze and Interpret Data (Program Outcome b2)
- Design a System, Component, or Process (Program Outcome c)
- Working on Interdisciplinary Teams (Program Outcome d)
- Identify, Formulate, and Solve Engineering Problems (Program Outcome e

- Workplace Writing (Program Outcome g2)
- Life-long Learning (Program Outcome i)
- Using Techniques, Skills, and Modern Engineering Tools (Program Outcome k)

4.1 Teamwork (Program Outcome d)

In our program, this Program Outcome is assessed in two courses, ECE 401: Ethics and Professionalism and ECE 492: Senior design. During this assessment cycle, Program Outcome d was assessed only in ECE 401: Ethics and Professionalism. During the next cycle, it will be assessed again in this course as well as in ECE 492: Senior Design, where teamwork is a major component of the course.

In ECE 401, teamwork is assessed in two different ways,

- Through a peer review of teamwork performance, and
- Through an essay question on an aspect of the importance of being able to work on a team on the final exam.

4.1.1 Peer Evaluation of Teamwork

There were nine groups in the course, and approximately 70% of the assignments were team assignments. Each person was rated by his/her teammates on the following measures:

- Contributions to discussions
- Carrying out assignments
- Teamwork spirit
- Value to the team

The following scale was used was the following: 4.0 = excellent, 3.0 = competent, 2.0 = adequate, 1.0 = weak, 0.0 = unsatisfactory. The goals set by the department are the following: All members of each group should score 3.0/4.0 (competent) or better on all four measures stated above.

Finding from the Peer Evaluation of Teamwork

All members of all groups scored 3.0/4.0 (competent) or better on all four measures except for student #5 in group 8 on "Carrying Out Assignments," who scored 2.8/4.0. The overall average for each student over the four categories ranged from a low of 3.1/4.0 to a high of 4.0/4.0. The department considers these results to indicate that except for one student, peers were satisfied with the contributions of each student to the team.

4.1.2 Essay on Teamwork Aspects on the Final Exam

During this assessment cycle, students in ECE 401 were asked to write an essay on how working on teams in course assignments increased their appreciation and awareness of the complexity of issues discussed in the news media. The goal for this activity was that the class average on this essay question should be 8.0/10.0 or that 70% of the class should score 8.0/10.0.

Findings from the Essay Exam

Both criteria were met, as the average score over 44 students was 8.8/10.0 and 83.7% of the students scored 8.0/10.0 or better

4.2 Solving Problems (Program Outcome e)

During the period covered by this report, student performance on this outcome was assessed in ECE 255: Introduction to Electronics Analysis and Design. During the next assessment cycle, it will be assessed in ECE 301: Signals and Systems and ECE 492: Senior Design.

4.2.1. Findings from ECE 255

Table 5 presents a summary of the analysis of final exam data from ECE 255, where the final exam consists of formal problem solving. The assessment of problem solving is where problems on the exam are rated according to the following taxonomy:

Level 1: problems that are "just like the homework"
Level 2: problems that call for the execution of a specified step-by-step procedure
Level 3: problems that require the student to select the appropriate step-by-step procedure
Level 4: problems that require the student to determine a strategy, or approach, that often require the use of one or more procedures
Level 5: problems that require the application of basic principles to a new situation

The criterion for evaluating student performance on each problem is whether or not the class average (percent) on each problem met or exceeded the desired average for that problem.

Table 5. Assessment Data and Findings for ECE 255

Problem Number	**1**	**2**	**3**	**4**	**5**	**6**
Maximum number of points	5	5	5	5	10	10
Enter level of question (1-5)	1	3	2	4	5	4
Enter desired average	3.5	3	3.5	3	6.5	6.5
Average on each problem	3.7	4.3	3.1	3.2	6.2	6.8
Write "Yes" if desired average is met, "No" otherwise	Yes	Yes	No	Yes	No	Yes

Evaluation of the EE 255 Data

Table 5 shows that student performance did not meet the desired levels on two of five problems. One of them was a Level 2 problem (execution of a specified procedure), and the other was a Level 5 problem (using basic principles in a new situation).

4.2.2 Findings From ECE 440

Table 6 presents the data from the Fall 2005 final exam in ECE 440: Transmission of Information. As with the assessment of ECE 255, problem solving is assessed using the problem solving taxonomy shown in section 4.21. Student performance did not meet the desired levels of performance on problems three and four, which were at levels 4 (determining an appropriate strategy) and 3 (selecting an appropriate procedure), respectively. There were no problems at level 1 ("just like the homework") and level 5 (applying basic principles in a new situation).

Table 6. Assessment Data from ECE 440

Problem number	1	2	3	4	5
Problem level	3	2	4	3	3
Maximum score	20	20	20	20	20
Average on each problem	9.5	15.5	5.8	8.3	10.4
Desired average on each problem	10	12	10	10	10
Goal met (enter "yes" or "no")?	close	Y	N	N	Y

Table 7 presents the course instructor's recommendation for improvements on the two problems that did not meet the desired performance levels. The recommendation involves a pre-requisite course and requires coordination with another instructor.

Table 7. Suggestions for Improvements in ECE 440

Problem Number	Level	Goal Met?	Suggestions for Improvements
Problem 3	4	N	Both problem 3 and 4 were problems that required the students use their knowledge of probability. Problem 4 was a probability problem, whereas problem 3 required the studnets to apply probability. Even though they had a thorough review of probability and
Problem 4	3	N	See note for problem 3 above

4.3 Ethics and Professionalism (Program Outcome f)

This Program Outcome is assessed in ECE 401: Ethics and Professionalism, a course required for all ECE majors. Two measures are used to assess this Program Outcome. They include:

- Essay questions on the final exam
- Multiple-choice questions on the final exam

Two questions on the essay part of the final exam and all twenty-seven questions on the multiple-choice part of the final exam assessed student learning in ethics and professionalism. The remaining three of the five essay questions assessed Program Outcomes d (teamwork), j (contemporary issues), and h (global and cultural impact).

4.3.1 Findings from the Two Essay Questions on the Final Exam

Students averaged 8.0/10.0 on both questions, which was the goal set for the essay questions. However, the percent of the class scoring 8.0 or better on each question was rather low (60% and 56%, respectively). While the performance goal was met, these low percentages should be investigated.

4.3.2 Findings from the 27 Multiple Choice Questions on the Final Exam

Traditionally, students perform better on the essay part of the final exam than the multiple choice part, and the Spring 2005 semester was no exception. Students in the class score 70% or better on 15 of the 27 questions, below the desired percent of 70%. Furthermore, the overall average of the class was only 68%,

below the desired 70% set for this measure. Thus we conclude that performance on this measure did not meet our desired goals.

4.3.3 Discussion of the Findings on Ethics and Professionalism

Since performance on the essay questions barely met the goals set for the class and since performance on the multiple choice questions did not meet our goals, we conclude that this outcome was not met. Students must be reminded each semester that the average of the multiple-choice scores of the exam scores about 10 percentage points lower than the essay part of the exam. Some students report that that they have very little experience writing an essay exam and that they can successfully find general education electives that do not require writing essays.

4.4 Workplace Oral Presentations (Program Outcome g1)

Workplace writing is assessed in two courses in the ECE program. One is in TCM 360: Communication in Engineering Practice, and the other is ECE 492: Senior Design. During this assessment cycle, this outcome was assessed in TCM 360 under the direction of Becky Fitterling in the Technical Communications Program.

Table 7 presents a summary of the assessment of workplace writing in TCM 360 during the Spring 2006 semester. Six ECE students were registered in the course Column 1 contains the items over which students were evaluated by two faculty members. Two statistics were evaluated for each item:

- Average score on each item on a five-point scale (column 2)
- Percent of the population scoring 3.5/5.0 or better (column 3)

The department considers that student performance is acceptable if either the average of the class is 3.5/5.0 or better or at least 70% of the class scores 3.5/5.0 or better.

Findings for Workplace Oral Presentations from TCM 360

The final evaluations are shown in column 7 in Table 7. For the spring 2006 semester, the students met the criterion for satisfactory performance on only one item—Visuals. The performance of the students in this spring 2006 semester will have to be scrutinized carefully to determine if this is a result of the small population (n = 6), if this is an anomaly, or if this is part of a new trend in ECE student quality.

Discussion of the Findings

Due to the small size of the sample (n = 6), the department feels that it would be pre-mature to generalize the results of this assessment to the general student population and that we should wait to see if the data is similar in the next assessment cycle. It is important to note that in the mechanical engineering population in the same course, only one item received a “No” evaluation. The department will be investigating whether the ECE student population and the ME student population are alike or not with regard to cognitive variables and performance in mathematics and physics courses.

Table 7. Assessment of Workplace Writing in TCM 360

	Average (n = 6)	#≥3.5	%≥3.5	Av≥3.5?	70%>3.5	Either?
Introduction	3.3	3	50%	N	N	N
Content	3.4	3	50%	N	N	N
Data	3.3	2	33%	N	N	N
Conclusion	3.1	3	50%	N	N	N
Organization	3.4	3	50%	N	N	N
Visuals	3.5	3	50%	Y	N	Y
Language	3.3	3	50%	N	N	N
Length	3.3	3	50%	N	N	N
Grammar	3.3	4	66%	N	N	N
Preparation	3.3	3	50%	N	N	N
Pace & volume	3.4	3	50%	N	N	N
Body Language	3.3	3	50%	N	N	N
Q&A	3.4	3	50%	N	N	N
Overall Impression	3.4	3	50%	N	N	N

4.5 Global Impact (Program Outcome h)

Our Global Impact program outcome says that graduates will be able to demonstrate "the broad education necessary to understand the impact of engineering solutions in a global and societal context." This outcome is assessed in ECE 401: Ethics and Professionalism using three learning experiences. Data comes from the Spring 2005 semester.

- The first is an assignment that requires students to write as essay that describes how two of their general education electives will help them work successfully in the global engineering environment, relating what they learned in those two courses with what they learned in ECE 401.
- The second is an essay question on the final exam that asks students to write on an aspect of global and/or societal concerns related to the practice of engineering.
- The third is a set of questions in the multiple-choice final exam related to global and societal concerns related to the practice of engineering.

4.5.1 Findings from the Essay Assignment Regarding General Education Electives on Global and Cultural Context

The goal set for this assignment is that 80% of the class should score B- or better. . The actual distribution of grades is the following:

- Number and percent of students who scored A-, A, or A+: 22/44 (50%)
- Number and percent of students who scored B-, B, B+: 19/44 (43.2%)
- Number and percent of students who scored C-, C, C+: 1/44 (2.2%)
- Number and percent of students who scored D-, D, D+ range: 1/44 (2.2%)
- Number and percent of students who scored F: 1/44 (2.2%)

The goal was met, as 93.2% of the students scored B- or better.

4.5.2 Findings from the Essay Exam Question on Global and Cultural Context

One of the five essay questions on the final exam assessed this Program Outcome. The class average of 8.5/10.0 on this question met the department's goal. However, only 60% of the class scored 8.0/10.0 or better, indicating that some attention is needed on this outcome.

4.5.3 Findings from the Multiple Choice Questions on Global and Cultural Impact

There were four questions on the multiple choice part of the final exam. Student performance on three of the four questions met the goal of 70% or better answering correctly. Alternately, the average of the class over the four questions was 83%, surpassing the goal of 70%.

4.6. Life-long Learning (Program Outcome i)

Life-long learning is assessed in two courses, ECE 401: Ethics and Professionalism and ECE 492: Senior Design. Life-long learning is also assessed through our alumni survey and our employer's survey.
4.6.1 Data from ECE 401

In this section, data from ECE 401 is presented, and ECE 492 will be assessed during the next assessment cycle. In ECE 401, life-long learning is assessed in assignment H-2, which is a team assignment that asks teams to collect a prescribed number of news articles from newspapers and the Internet that discussed issues that are being debated in the media. Each issue was required to have two competing sides. Team reports were submitted, not individual reports. The assignment required teams to

- Collect articles that described issues where opinions are divided
- Write a summary of the issue
- Arrive at the team's position on the issue, if possible

Evaluation of Student Performance on Assignment H-2

The assessment goal is for each team to score B- or better on this assignment. This goal was not attained, as three groups scored in the A-/A/A+ range, five groups scored in the B-/B/B+ range, and two groups scored in the C-/C/C+ range. Two groups performed below the desired level even though for the first time in the course, teams were asked to submit a sample write-up on one of their articles for feedback from the instructor.

4.7 Contemporary Issues (Program Outcome j)

In ECE 401 (Spring 2006), students were given two assignments that were related to our Contemporary Issues outcome. They will be referred to as Assignments H-2 and H-5.

4.7.1 Findings from Assignment H-2

See section 4.6 for assessment results for assignment H-2 in ECE 401.

4.7.2 Findings from Assignment H-5

Assignment H-5 was a team term paper in which teams were asked to process one of the articles that they collected in assignment H-2 and write a term paper that described the following:

- A complete description of the issue, including a discussion of the two compelling sides without details
- Arguments defending each side of the issue
- The team's final position on the issue
- The group's motivation for its final stance on the issue
- The group dynamics throughout the process (how the group interacted)

Each individual on the team was responsible for a particular section of the report. Thus, each individual received a grade for his/her part of the report, and the team received an over-all grade for the team report.

Evaluation of Student Performance on Assignment H-5

There are two assessment goals for this report, one for the team and one for each individual. The two goals were as follow:

- Each team grade is expected to be B- or better.
- Each individual grade is expected to be C+ or better

Both H-5 goals were met.

Evaluation of Student Performance on the Essay Final Exam

The class average on the question on the essay final exam that pertained to our Contemporary Issues program outcome was 8.3/10, with 83.7% of the class scoring 8.0 or better. Thus the outcome was met on this assignment.

4.7.3 Discussion of our Program Outcome on Contemporary Issues

Overall, because of the performance on the term project, H-5, and the essay question, we consider this Program Outcome to be satisfied. However, the data from assignment H-2 shows that students need more guidance in the execution of this assignment. One way would be to provide samples from previous semesters.

5.0 Indirect Assessment of Student Learning

Indirect assessment of student learning takes place in two ways in our program. The first indirect assessment of student learning is done through our alumni survey.

The second is a survey of self-efficacy that is conducted in each course at the end of each semester where students are asked to report on their confidence on how well they feel they have accomplished the learning outcomes that are published for their courses. The purpose of this process is to give instructors a view of students' self-efficacy on their abilities to perform the actions described in the course outcomes for each course.

5.1 Survey of Alumni

The result of our indirect assessment of student learning through an alumni survey was presented in Section 2.0, and the reader is directed to that section. The items in column 1 in Table 2 are linked to our Program Outcomes and Program Educational Objectives wherever possible. Rather than re-stating the results here, the reader is directed to Table 2.

5.2 Self-Efficacy in the Course Outcomes

A summary of the self-efficacy data for the Fall 2005 semester is shown in Table 8, which condenses the data according to a set of criteria that was developed by the department in order to reduce the section by section data to a set of holistic numbers that can be used to track self-efficacy semester by semester. There are two criteria that are used to evaluate the survey data for each course. They are the following:

- Criterion 1: 70% of the course outcomes averaged 3.5/5.00 or better for the course.
- Criterion 2: The overall average for all outcomes for the course is 3.50/5.00 or better.

The goal of the department is that either Criterion 1 or Criterion 2 should be satisfied for each course. As shown in Table 8, three courses did not satisfy at least one of the two criteria during the Fall 2005 semester. Data from the Spring 2006 semester has been processed and will be presented during the report over the next assessment cycle.

Table 8. Summary of the ECE Survey of Self-Efficacy in the Course Outcomes

Number of courses surveyed	26
Number of courses satisfying Criterion 1	23
Number of courses satisfying Criterion 2	23
Number of courses satisfying either Criterion 1 or Criterion 2	23

Note: the department established Criterions 1 and 2solely as a means to characterize the results of the data so that the results of the surveys can be tracked semester after semester. The performance levels were set without any investigation into the relationship to quality of student learning. This is further compounded by the fact that the data represents self-reported confidence in how well they learned the course outcomes.

In this indirect assessment of student learning, instructors are asked to review the data from their courses and suggest improvements that they might be able to implement in their classes to improve student learning, particularly on those course outcomes that fall below a desired 3.50/5.00. Results of this part of the process will be reported in the next assessment cycle.

APPENDIX A. Peer Ratings of Teamwork in ECE 401

		Contributions to Discussions	Carrying Out Assignments	Teamwork Spirit	Value to Team	Over-all score (average)
Group 1	Student #1	3.5	3.4	3.5	3.4	3.5
	Student #2	3.4	3.6	3.3	3.5	3.5
	Student #3	3.6	3.4	3.6	3.3	3.5
	Student #4	3.4	3.6	3.2	3.4	3.4
	Student #5	3.6	3.5	3.6	3.7	3.6
Group 2	Student #1	3.7	3.2	3.7	3.2	3.5
	Student #2	3.6	3.7	3.5	3.8	3.7
	Student #3	3.4	3.5	3.1	3.5	3.4
	Student #4	3.6	3.6	3.6	3.7	3.6
	Student #5	3.2	3.7	3.6	3.3	3.5
Group 3	Student #1	3.5	3.3	3.4	3.5	3.4
	Student #2	3.5	3.3	3.6	3.6	3.5
	Student #3	3.5	3.5	3.4	3.5	3.5
	Student #4	3.5	3.8	3.5	3.5	3.6
	Student #5	3.5	3.8	3.6	3.5	3.6
Group 4	Student #1	3.2	3.3	3.3	3.3	3.3
	Student #2	3.2	3.1	3.4	3.2	3.2
	Student #3	3.8	3.9	3.5	3.9	3.8
	Student #4	3.9	3.9	4.0	4.0	4.0
	Student #5	3.4	3.3	3.5	3.1	3.3
Group 5	Student #1	3.9	4.0	3.9	4.3	4.0
	Student #2	3.4	3.2	3.3	3.1	3.3
	Student #3	3.5	3.3	3.1	3.1	3.3
	Student #4	3.5	3.6	3.6	3.6	3.6
	Student #5	3.1	3.5	3.7	3.5	3.5
Group 6	Student #1	3.8	3.3	3.8	3.5	3.6
	Student #2	3.5	3.5	3.3	3.8	3.5
	Student #3	3.5	3.5	3.5	3.5	3.5
	Student #4	3.3	3.7	3.5	3.3	3.5
Group 7	Student #1	3.7	3.6	3.7	3.6	3.7
	Student #2	3.8	3.8	3.7	3.6	3.7
	Student #3	3.4	3.4	3.3	3.9	3.5
	Student #4	3.4	3.5	3.4	3.3	3.4
	Student #5	3.2	3.3	3.4	3.2	3.3
Group 8	Student #1	3.9	3.7	3.5	3.4	3.6
	Student #2	3.4	3.6	3.1	3.4	3.4
	Student #3	3.9	3.8	3.6	3.9	3.8
	Student #4	3.6	3.7	3.9	3.8	3.8
	Student #5	3.1	**2.8**	3.4	3.1	3.1
Group 9	Student #1	3.8	3.5	3.5	3.5	3.6
	Student #2	3.0	3.3	3.2	3.3	3.2
	Student #3	3.3	3.0	3.3	3.1	3.2

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING 2006 ANNUAL ASSESSMENT REPORT
Prepared by Elaine Cooney—July 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 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.	ECET program outcome #1 - "Demonstrate knowledge, techniques (including the use of modern tools), and skills in the use of components, circuits, programs and systems encountered in the degree program's courses." 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 learn these skills.	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. Selected exam questions were used in ECET 157, 164 and 209 to assess this outcome.	The department continued to be strong is this outcome with 35 relevant course objectives in each course offered; 80.4 percent of students indicating they strongly agree or agree that they can perform tasks indicated by the course objectives in Spring, and 84 percent in Fall 2004.	The department modified the assessment plan for 2005 and beyond. The new assessment methods continue to include student self-assessment, and specific questions on final exams were added. The assessment plan for 2005 assesses programs rather than separating into AS and BS degrees.	The department continued to be strong in this outcome. The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 79.2%. In Fall 2005, 84.6%of students strongly agreed or agreed they could perform the objectives. On exam questions targeting this criterion during the fall semester, 72.6% of the students scored a 70% or better.	The department will continue to focus on teaching these necessary skills.

ECET Assessment Summary of the B.S. Degree Program – 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 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 criterion is mapped to ECET Program Outcome 2 – "Use current knowledge of mathematics, science and emerging technology tools of their discipline to solve problems and demonstrate solutions."	In addition to classroom activities such as lectures, homework, and group learning activities, laboratories are a strong component of learning.	Solving problems using math and other tools is foundational to all circuits courses.	Student self-assessment of comprehension of course objectives is measured. Specific questions demonstrating application of mathematics in ECET 207, 307 and 357 are included on final exams.	80.4 percent of students in Spring 2004 and 85.1% in Fall 2004 indicated they strongly agree or agree that they can perform tasks indicated by the course objectives. Our Industrial Advisory Board (IAB) has informally said that our labs deal with emerging technologies.	Specific assessment questions demonstrating the application of math have been added to three courses.	The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 74.0%. In Fall 2005, 76.6%of students strongly agreed or agreed they could perform the objectives. On exam questions targeting this criterion during the fall semester, 85.8% of the students scored a 70% or better.	The department will continue to monitor student progress in this area, as well as add technologies to course work as appropriate.

ECET Assessment Summary of the B.S. Degree Program – 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 assessment findings	9. Impact / further change needed
ABET Criterion 1, item c; Conduct, analyze and interpret experiments and apply experimental results to improve processes.	This criterion maps to ECET Program Outcome 5 – "Conduct, analyze and interpret experiments, and assess results."	Laboratories are a strong component of this learning objective. All ECET courses include a laboratory component. Students receive training on equipment from the lab instructor.	Students will practice this objective in all courses, since everyone includes a laboratory component.	Student self-assessment of comprehension of course objectives is measured. Laboratory practical exams 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.	87 percent (Spring 2004) and 80.3 percent (Fall 2004) of students indicated 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. Results are now tracked for lab practical exams in ECET 207 and 209.	The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 81.7%. In Fall 2005, 78.3%of students strongly agreed or agreed they could perform the objectives. 82.7% of students passed lab practical exams during the Fall, 2005 semester.	We plan to develop a rubric to be used in ECET 307 and 357 to measure student's ability to analyze experimental results.

ECET Assessment Summary of the B.S. Degree Program – 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 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.	This criterion maps to ECET Program Outcome 4 – "Apply and design components, circuits, systems and software programs in their specialty area as demonstrated in a senior project." Students should be able to design a system by creatively applying fundamental skills learned in the curriculum.	Some laboratory assignments require a creative approach, and many classes have required projects. Faculty support students in the process with classroom instruction and informal help. Formal instruction in the design process occurs in ECET 490 – Senior Design I.	Most ECET courses have course objectives that have a creative component.	Student self-assessment of their comprehension of course objectives was measured. This outcome was also evaluated in the department's terminal senior design course: both the design itself and the design process are measured.	80.9 percent (Spring) and 87 percent (Fall) of students indicated they strongly agree or agree that they can perform tasks indicated by the course objectives. The results from ECET 491 were a 4.14/5.00 rating (Spring) and 3.18/5.00 (Fall).	Courses are assessed at the end of each semester for continuous improvement. A rubric to evaluate design projects (and specifically the senior design project) was developed and implemented.	The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 81.5%. In Fall 2005, 81.7%of students strongly agreed or agreed they could perform the objectives. Faculty evaluated the senior design projects, and found that in the Spring 2005 semester 91.6% of the students scored a 3 or above on the rubric elements. In fall, 2005, 82.4% scored a 3 or above.	ECET 490 will be transformed into an on-line course. Data will be collected to evaluate this new delivery medium.

ECET Assessment Summary of the B.S. Degree Program – 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 assessment findings	9. Impact / further change needed
ABET Criterion 1, item e; Function effectively on teams.	This criterion maps to ECET Program Outcome 6 – "Function as a member of a 2-4 person team to complete a task in a timely manner. Demonstrate ability to organize work done by team members." Students should successfully work within a team environment: this includes understanding different roles within a team and working with others in modular designs and projects.	Laboratories are a strong component of this learning objective. Other classroom activities include discussions and group learning activities. Many ECET students take OLS courses to learn more about team work, and formal team building is included in ECET 371.	Students work in small groups in most of our laboratories and learn practical group skills. Courses ECET309, 360, 371 and 417 have formal group projects.	A self-assessment was completed by students and the instructor teaching courses with group projects. Course objectives were evaluated by students. The ECET Teaming rubric was used by faculty and student peers to assess team skills in ECET 209, 234, 307, 371 and 417.	81.5 percent (Spring 2004) and 85% (Fall 2004) of students indicated they strongly agree or agree that they can perform tasks indicated by the course objectives ECET 417 had two group projects: the first had an average team score of 3.7/5.0. After teaming instruction, the results were 4.53/5.0. There as a perception that more courses had problems with individual students within teams (Spring 2004). Students in ECET 360 rated their team skills as 4.58 / 5.00 (instructor rating 4.56 / 5.00) – Fall 2004.	Courses are assessed at the end of each semester for continuous improvement. Rubric data is collected separately from student peers and faculty.	The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 88.8%. In Fall 2005, 85.2%of students strongly agreed or agreed they could perform the objectives. In Spring, 2005, Faculty assessed 92.9% of teams scored a three or above on rubric items, but student peers reported only 69.4%. (This disparity is caused results coming from 2 different classes). In Fall, 2005 (when more classes participated) the faculty reported scores of 3 or above 84.9% of the time. Students reported 3 or above for 85.2% of the rubric items.	We need to look at addressing teaming training earlier and throughout the curriculum. Currently, rubric data for each class is combined to generate a histogram of performance for each rubric item, and we are not tracking if groups are performing at an acceptable level for *all* rubric items. We should investigate the validity of these different scoring methods.

ECET Assessment Summary of the B.S. Degree Program – 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 assessment findings	9. Impact / further change needed
ABET Criterion 1, item f; Identify, analyze and solve technical problems.	This maps to ECET Program Outcome 3 – "Identify, analyze and solve technical problems as required in the degree program's courses." 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. In ECET 207, 231, 307, 309, 417, 483 and BMET 320 specific final exam questions are used to measure this outcome (goal: 70% score 70% or higher on each question).	83.1 percent (Spring) and 84.5 percent (Fall) of students indicated they strongly agree or agree that they can perform tasks indicated by the course objectives. Results of using the design rubric in ECET417 showed an average of 3.10 out of 5, with 77% of teams scoring a 3, 4, or 5.	Courses are assessed at the end of each semester for continuous improvement. A "problem solving steps" bookmark has been developed, and has been distributed to students.	The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 75.7%. In Fall 2005, 79.6%of students strongly agreed or agreed they could perform the objectives. On exam questions targeting this criterion during the spring semester, 69.6% of the students scored a 70% or better, and in the fall, 2005 semester 67.6% of the students scored a 70% or better.	Problem solving steps will continue to be stressed, especially in foundational courses. In Fall, 2006, a section of ECET 107 will be offered with an additional recitation that will focus on problem solving.

ECET Assessment Summary of the B.S. Degree Program – 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 assessment findings	9. Impact / further change needed
ABET Criterion 1, item g; Communicate effectively.	This criterion maps to ECET Program Outcome 7 – "Identify, analyze and solve technical problems as required in the degree program's courses." We are evaluated based on communica-tions skills that are expected by industry of recent graduates.	Students are required to write reports and papers that are returned for corrections and/or graded for clarity and grammar. Oral presentations are critiqued.	Students take the required English composition and speech courses. In addition, papers are required in many courses, including ECET304, 490 and 491. Oral reports are required in ECET 234, 371, 490 and 491.	Oral and written presentations were evaluated in ECET 491 and other courses.	95.2 percent of students (Spring) and 91.7% (Fall) indicated they strongly agree or agree that they can perform tasks indicated by the course objectives. Written reports in ECET 417 were rated at 4.0/5.0 In ECET 491, the presentations were ranked as 4.14/5.00 (Spring) and 3.95/5.00 (Fall)	Written reports are to be assessed in ECET 155, 157, 234, 304, 403, 417, 483 and Senior Design: oral reports will be assessed in 155, 234, 360, 371, 483 and Senior Design.	The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 91.6%. In Fall 2005, 85.6%of students strongly agreed or agreed they could perform the objectives. In the Spring, 2005 semester, faculty rated 91.9% of the items on the written report rubric and 95.6% of the items on the oral report rubric a 3 or above. In Fall, 2005, 93.1% of written report rubric items and 97.1% of oral report rubric items were rated a 3 or above.	The department will continue to require and monitor communication skills demonstrated in courses.

ECET Assessment Summary of the B.S. Degree Program – 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 assessment findings	9. Impact / further change needed
ABET Criterion 1, item h; Recognize the need for and possess the ability to pursue lifelong learning.	This criterion maps to ECET Program Outcome 8 – "Demonstrate skills for life-long learning by locating, evaluating and applying relevant information using external resources such as the Internet, data books, trade publications and library resources."	We require research projects using technical literature. ECET 490-91 requires demonstration of technical competence in state-of-the art project management and project design.	Research strategies are presented in ECET 103. Many courses require investigative reports or assignments, including ECET234, 304, 307, 360, 403, 472, 490 and 491.	Student self-assessment of their comprehension of course objectives are measured. An assignment to assess the validity of websites using a rating scale is evaluated in ECET 304. In ECET 307, students are required to use library resources to research a topic.	87.5 percent (Spring) and 100% (Fall) of students indicated they strongly agree or agree that they can perform tasks indicated by the course objectives.	Courses which require outside research as part of papers or projects are to stress the importance of assessing the validity of their sources. Additionally, sources other than Internet sources are now required.	The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 90.0%. In Fall 2005, 90.2%of students strongly agreed or agreed they could perform the objectives. In Spring 05, 90.6% of ECET 307 students successfully completed an assignment to find, cite, and summarize a journal article.	Investigate other measurable outcomes associated with life long learning. Investigate other assessment methods, especially in PBL courses/projects (PBL projects require self-directed learning, essential in life long learning).

ECET Assessment Summary of the B.S. Degree Program – 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 assessment findings	9. Impact / further change needed
ABET Criterion 1, item i; Understand professional, ethical and societal responsibilities.	This criterion maps to ECET Program Outcome 9 – "Demonstrate ethical conduct as described in the university student code of conduct. Demonstrate knowledge of professional code of ethics." Students can successfully communicate the many alternative choices.	Statements warning against plagiarism and reminding students of the student code of conduct will be added to some syllabi. Faculty will use the university policies to enforce the code of conduct.	In ECET 103 & ECET 107, students review the Student Code of Conduct and Statement on Civility. In ECET 499, the IEEE code of ethics and ethical case studies are presented in the classroom.	Student work is evaluated using turnitin.com to check for plagiarism. Students complete a "self-assessment" survey each semester to evaluate course objectives which are mapped to this outcome. The faculty is surveyed regarding student ethics and civility (Professionalism, Social ethics, Technical ethics, and Plagiarism criteria).	84 percent (Spring) and 61% (Fall) of students indicated they strongly agree or agree that they understand material related to course objectives covering this topic. Changes have been implemented to address the low number in Fall (although the total number of responses is low (18 total), which indicate the percentage may not be as significant as other percentages in the report.	This outcome has undergone significant change: we now formally educate students in ECET 106 and 107, and added a new required course in the Senior year on ethics. A civility / ethics rubric was also developed and will be implemented into the assessment plan in 2005.	In Spring 2005, 100.0% of students showed 10% or less plagiarism as measured by turnitin.com. In Fall 2005, 57.1% of students showed 10% or less plagiarism. In Spring 2005, 90.1% items on the civility rubric were scored by faculty a 4 or 5; In Fall 2005, 100% of the items were scored 4 or 5. (The course with high plagiarism measured by turnitin.com is not included in the faculty survey data.) The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 63.0%. In Fall 2005, 89.2%of students strongly agreed or agreed they could perform the objectives. (Most of this improvement came in ECET 499 objectives.)	Faculty will continue to educate students on "What is plagiarism" and enforce the penalties for plagiarism.

ECET Assessment Summary of the B.S. Degree Program – 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 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.	This criterion is mapped to ECET Program Outcome 10 – "Demonstrate a respect for diversity as described in the university civility statement. Recognize contemporary professional, societal and global issues in case studies and course projects."	Faculty model respect for students. Case studies are presented in the classroom.	In ECET 103 & ECET 107, students review the Student Code of Conduct and Statement on Civility. ECET 499 Ethics & Professionalism In Technology is now required for all students.	Faculty are surveyed regarding student ethics and civility (items Civility, tolerance & plagiarism on rubric) Students will complete a quiz over sexual harassment and diversity in ECET 499. Students will complete a case study including global perspective in ECET 499. Students complete a "self-assessment" survey each semester to evaluate course objectives which are mapped to this outcome.	85.5 percent of students (Spring) and 90% (Fall) indicated they strongly agree or agree that they understand material related to course objectives covering this topic.	The department developed a "civility / ethics" rubric and has implemented it into the assessment plan. The department added a required 1credit ethics course in the senior year.	The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 63.6%. In Fall 2005, 84.6%of students strongly agreed or agreed they could perform the objectives. (Most of this improvement came in ECET 499 objectives.) The faculty survey regarding student ethics and civility (items Civility, tolerance & plagiarism on rubric) showed 88.1% items scoring a 4 or 5 during Spring 2005 (less than goal of 90%), and 100% in Fall 2005.	ECET 499 will become a permanent course. The department will continue to monitor student progress in this area.

ECET Assessment Summary of the B.S. Degree Program – 2006

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. 2005 assessment findings	7. Changes planned/put into place	8. 2006 assessment findings	9. Impact / further change needed
ABET Criterion 1, item k; Have a commitment to quality, timeliness and continuous improvement.	This criterion maps to ECET outcome 11 – "Demonstrate quality, timeliness and ability to complete increasingly complex homework and projects throughout the degree experience."	Stress the importance of handing work in neat and on time. Teach project management making use of Gantt charts and other organizational tools.	Throughout the 100/200 level courses, and ECET490/491	Student self assessment of their comprehension of course objectives is measured. A rubric is used to measure ECET 157 power supply project construction. Record the number of students turning selected assignments in on time, late, and not at all in ECET 107, 109, 164, 207, 209, 231 and 284. Gantt charts for each student project in 491 are assessed. Quality of construction/ software of senior design projects is evaluated using a rubric.	87.5 percent (Spring) and 78.1% (Fall) of students indicated they strongly agree or agree that they understand material related to course objectives covering this topic. 80.4 percent of assignments in ECET 307 were submitted on time.	A rubric to assess quality of senior design projects was implemented.	The percentage of students indicating that they strongly agree or agree they can perform tasks indicated by the course objectives associated with this outcome in Spring 2005 was 78.8%. In Fall 2005, 80.0%of students strongly agreed or agreed they could perform the objectives. In Fall, 2005, the power supply construction rubric showed 82.1% of items evaluated 4 or 5; the senior project quality rubric showed 82.3% scoring 4 or 5. In Spring, 2005 69.8% of counted assignments were turned in on time, and 77.1% were turned in on time in the Fall, 2005. Both semesters were lower than the goal of 80%, but there was improvement.	A rubric to assess milestone charts will be implemented in senior design (ECET 490/491). Faculty must continue to stress timeliness in turning in assessments.

FRESHMAN ENGINEERING PROGRAM 2006 ASSESSMENT ANNUAL REPORT

Prepared by Janet Meyer and the Freshman Engineering Staff

June, 2006

1	2	3	4	5	6	7	8
Program Outcomes	**Measurable Outcomes: What Will the Student Know or Be Able To Do?**	**Courses Reflecting the Outcomes**	**Methods of Teaching and Learning**	**How Do You Measure Each of the Desired Behaviors Listed in Column 2?**	**What Are the Findings in Assessing the General Outcomes (column 1)?**	**Proposed Improvements (and Changes) Based on Available Assessment Findings?**	**Impact of Changes?**
(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 reverse-engineer a real world electro-mechanical device. Students will be able to write programs in C language to solve engineering problems.	ENGR 196, ENGR 197	Lectures, computer assignments, labs, group discussions, homework assignments, reverse-engineering projects. .	Tests, homework, computer programs, course outcome surveys, student satisfaction surveys, evaluation of project reports.	Quantitative assessment across sections is not available. Outcome surveys for ENGR 196 and 197 have ratings above 3.75 for most outcomes involving math and science application. Preliminary survey indicates benefit of a reverse-engineering project in meeting learning objectives. Upper division professors in ECE and ME report that students do not retain Matlab learned in freshman year.	(b) Use standardized exams for the different sections of courses to help better assess the program outcomes. (b) A standardized final exam for ENGR 197 is planned for 2006-2007.) (b) Extend hands-on team projects to all sections of Engr 196. (a) and (b) Develop better-structured projects using feedback gained from pilot project surveys in 2005/2006. (a) Remove Matlab from freshman curriculum and insert a one-credit Matlab course in the sophomore year.	Data collection is continuing

Program Outcomes	Measurable Outcomes: What Will the Student Know or Be Able To Do?	Courses Reflecting the Outcomes	Methods of Teaching and Learning	How Do You Measure Each of the Desired Behaviors Listed in Column 2?	What Are the Findings in Assessing the General Outcomes (column 1)?	Proposed Improvements (and Changes) Based on Available Assessment Findings?	Impact of Changes?
(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 models. Students will be able to construct a simple circuit	ENGR 196	Tutorials in class, lectures, computer assignments, lab work, group discussions, homework assignments, and Web resources.	Lab reports, exams, and outcome surveys.	Currently less than 59% of ENGR 196 rate themselves 4.00 or above on a scale of 1.00 to 5.00 when asked whether the course helped them to construct a simple circuit	(a) Use robots to illustrate electrical principles. (b) Institute the use of frequent classroom assessment techniques to encourage and monitor student learning	Data collection is continuing

Program Outcomes	Measurable Outcomes: What Will the Student Know or Be Able To Do?	Courses Reflecting the Outcomes	Methods of Teaching and Learning	How Do You Measure Each of the Desired Behaviors Listed in Column 2?	What Are the Findings in Assessing the General Outcomes (column 1)?	Proposed Improvements (and Changes) Based on Available Assessment Findings?	Impact of Changes?
(d) Ability to function on multi-disciplinary teams	Students will be able to work together in small groups to carry out experiments and to complete projects. Students will be able to collaborate with others to report on project findings, orally and in writing. Students will be able to operate as a member of a team with an understanding of the roles and relationships of members.	ENGR 195, ENGR 196	Lectures and team building exercises; practice in teamwork doing laboratory experiments, reverse engineering projects, library research projects, and team oral and written reports.	Lab reports, project presentation grades, and peer evaluations	Students have improved understanding of the roles and requirements of teamwork	(a) Continue to Include more specific teamwork instruction in ENGR 195 and ENGR 196; and (a) continue to extend reverse engineering team projects to all sections at IUPUI. (a) Continue teamwork instruction at Butler and continue second team project.	Over 80% of students rate themselves above 4.00 on a scale of 1.00 to 5.00 when asked about their ability to operate on multidisciplinary teams

Program Outcomes	Measurable Outcomes: What Will the Student Know or Be Able To Do?	Courses Reflecting the Outcomes	Methods of Teaching and Learning	How Do You Measure Each of the Desired Behaviors Listed in Column 2?	What Are the Findings in Assessing the General Outcomes (column 1)?	Proposed Improvements (and Changes) Based on Available Assessment Findings?	Impact of Changes?
(e) Ability to identify, formulate, and solve engineering problems	-Starting with a given problem, students will be able to develop 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, assigned computer programs, and class exercises.	Tests, quizzes, homework, computer programs, outcome surveys.	Complaints were received from some students in ENGR 197 regarding learning both Matlab and C programming in one semester. Too much is covered in a short time. Students are still having difficulty developing algorithms using a step by step process. Current outcomes report that 67% of students rate themselves at 4.00 or above on a scale of 1.00 to 5.00 when asked about ability to develop algorithms using a step by step process Over 70% of students rate themselves at 4.00 or above on a scale of 1.00 to 5.00 when asked about ability to solve engineering problems using C programming. This finding is an improvement over previous ratings; however, more attention will continue to be directed towards improving this outcome Students' ability in writing programs in C to solve engineering problems has improved from the previous year.	(a) and (b) Remove Matlab from the freshman curriculum and add a separate Matlab course in the sophomore year. Matlab has been removed from ENGR 196 and 197 effective Fall 2006. Matlab will be taught as a separate course, ENGR 297, beginning Spring 2007 (b) Increase the use of flow charting and pseudo-coding to improve understanding of algorithms (b) Administer a standardized C programming final exam in 2006-2007 to assist with assessment.	Impact of changes will be assessed during 2006 – 2007.

Program Outcomes	Measurable Outcomes: What Will the Student Know or Be Able To Do?	Courses Reflecting the Outcomes	Methods of Teaching and Learning	How Do You Measure Each of the Desired Behaviors Listed in Column 2?	What Are the Findings in Assessing the General Outcomes (column 1)?	Proposed Improvements (and Changes) Based on Available Assessment Findings?	Impact of Changes?
(f) Understand professional and ethical responsibilities.	Students should be able to demonstrate a knowledge of the engineering professional societies Students should be able to articulate an understanding of the responsibility of engineers regarding safety.	ENGR 195	Presentations by student organizations, web searches, lectures and case studies.	Increased membership in student organizations Homework, reports and outcome surveys.	Freshman student membership in the engineering professional societies is currently low; Outcome surveys indicate student mastery (ratings above 4.1).	Try to insure that professional society representatives meet with all sections early in the semester.	Student engineering professional societies need to improve recruitment methods directed toward freshman engineering students

Program Outcomes	Measurable Outcomes: What Will the Student Know or Be Able To Do?	Courses Reflecting the Outcomes	Methods of Teaching and Learning	How Do You Measure Each of the Desired Behaviors Listed in Column 2?	What Are the Findings in Assessing the General Outcomes (column 1)?	Proposed Improvements (and Changes) Based on Available Assessment Findings?	Impact of Changes?
(g) Ability to communicate effectively	Students will be able to write reports and make project presentations to peers.	ENGR 195 ENGR 196	Lectures, project reports, and oral presentations including PowerPoint.	Written report and oral presentation evaluations using rubrics.	Students are developing an appreciation for communication skills in engineering. Better guidelines are needed for reports in reverse engineering project. Currently less than 55% of ENGR 196 rate themselves 4.00 or above on a scale of 1.00 to 5.00 when asked whether the course helped them to write lab and project reports	(a) Improve guidelines for ENGR 195 research reports (b) Continue to Improve guidelines for reverse engineering project reports. (b) Provide sample reports and add group exercises in critiquing reports .	Over 80% of ENGR 195 students rate themselves 4.00 or above on a scale of 1.00 to 5.00 when asked whether the course improved their ability to collaborate to produce a report

Program Outcomes	Measurable Outcomes: What Will the Student Know or Be Able To Do?	Courses Reflecting the Outcomes	Methods of Teaching and Learning	How Do You Measure Each of the Desired Behaviors Listed in Column 2?	What Are the Findings in Assessing the General Outcomes (column 1)?	Proposed Improvements (and Changes) Based on Available Assessment Findings?	Impact of Changes?
(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, project reports, project presentations, and outcome surveys.	Students indicate a preliminary understanding in outcome surveys and in project presentations.	(a) Use more real world examples in ENGR 195 (including products investigated in ENGR 196) when studying impact of engineering on society.	Over 80% of ENGR 195 students rate themselves 4.00 or above on a scale of 1.00 to 5.00 when asked if they can articulate a definition of engineering and appreciate the contributions of engineering and engineers in today's world

Program Outcomes	Measurable Outcomes: What Will the Student Know or Be Able To Do?	Courses Reflecting the Outcomes	Methods of Teaching and Learning	How Do You Measure Each of the Desired Behaviors Listed in Column 2?	What Are the Findings in Assessing the General Outcomes (column 1)?	Proposed Improvements (and Changes) Based on Available Assessment Findings?	Impact of Changes?
(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. Students will be able to use Front Page to develop web pages. Students will be able to perform library and web searches. Students will be able to use PowerPoint in presentations.	ENGR 195, ENGR 196, ENGR 197	Lectures, classroom assignments, tutorials, homework, laboratory work and presentations	Graded assignments, lab reports, tests, project presentations, and outcome surveys.	Outcome surveys report that student rate their ability to use ProEngineer high. 88% of students of ENGR 196 students rate themselves 4.00 or above on a scale of 1.00 to 5.00 when asked how well the course prepared them to use ProEngineer to prepare solid models. The number drops to 79% when asked about using ProEngineer to extract 2-D engineering drawings from a solid model Over 76% of ENGR 196 students rate themselves 4.00 or above on a scale of 1.00 to 5.00 when asked about their ability to use PSpice to model circuits. Over 74% of ENGR 197 students rate themselves 4.00 or above on a scale of 1.00 to 5.00 when asked how well the course has helped them use a standard C program development environment.	(a) As mentioned above, Matlab has been moved to a separate course, ENGR 297. (a) Extend engineering projects to all sections of ENGR 196 to enhance ProE applications and give more experience with PowerPoint.	Data collection is continuing. Student data will be reviewed to determine the effect of the project on enhancing both learning and retention in engineering

Summary of Student Satisfaction Survey Results
Freshman Engineering Program
2003-2005

	Questions	Spring 2003	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006
1.	Quality of Academic Advising	3.88 (95)	3.97 (139)	3.95 (129)	3.96 (143)	4.19 (101)	4.15 (121)	4.22 (109
2.	Quality of student support in adjusting to college	3.56 (81)	3.77 (124)	3.72 (129)	3.78 (134)	3.77 (102)	3.91 (112)	3.92 (101)
3.	Scheduling of ENGR 195, 196, 197	3.76 (104)	3.80 (141)	3.78 (129)	3.99 (145)	4.08 (104)	4.01 (117)	4.19 108
4.	Classroom environment conducive to learning	3.82 (103)	3.86 (145)	3.91 (129)	4.07 (147)	4.14 (106)	4.18 (118)	4.27 (110)
5.	Quality of Engineering and Technology computer labs	3.85 (105)	3.60 (141)	3.99 (129)	4.00 (146)	4.07 (106)	4.40 (118)	4.49 (108)
6.	Quality of ENGR 196/197 help sessions in aiding classroom performance	3.48 (61)	3.61 (88)	3.54 (129)	3.53 (93)	3.77 (76)	3.79 (63)	3.87 (70)
7.	Opportunities for networking with fellow students and faculty through professional societies such as ASME, IEEE, AIAA, SWE, NSBE, SAE, etc.	3.25 (63)	3.60 (103)	3.73 (129)	3.81 (110)	3.58 (72)	3.70 (80)	3.66 (62)
8.	Career planning assistance, department selection (ME/ECE/others) and study skills development	3.43 (71)	3.38 (117)	3.57 (129)	3.51 (119)	3.63 (88)	3.78 (99)	3.72 (87)
9.	Overall freshman experience on the IUPUI campus	3.57 (97)	3.75 (138)	3.79 (129)	3.90 (139)	4.0 (103)	3.86 (117)	4.07 (108)

10.	Overall quality of Freshman Engineering education	3.65 (100)	3.80 (142)	3.78 (129)	4.01 (140)	4.12 (105)	4.01 (118)	4.22 (109)
11.	Quality of Instruction (new question Spring '04)	N/A	N/A	3.89 (129)	3.93 (145)	4.20 (106)	3.96 (121)	4.22 (109)

Analysis

Student satisfaction data for the Freshman Engineering Program summarized above show an improvement in student satisfaction for nearly all categories both in the Fall and Spring semesters, 2005-2006, when compared with those of corresponding semesters of the previous academic year.

- In both spring and fall semesters, satisfaction was relatively high in the areas of academic advising, class scheduling, classroom and computer lab environment, quality of instruction, and overall freshman engineering education. Student satisfaction ratings in all categories stayed essentially the same or improved. Significant improvement was seen in the quality of support in adjusting to college.

- Efficacy of help sessions varies with the time of day the CNC labs are available for tutoring. In the future, a lab space for student projects may also become a student help site.

- Opportunities for networking with fellow students and faculty through professional societies such ASME, IEEE, etc has shown an overall rise from Spring 2003. It appears that opportunities for networking with students through professional societies ebbs and flows with the strength of the student organizations. Several engineering student societies were relatively inactive during the 2005-2006 academic year. In the freshman learning community class, we continue to place emphasis on participation in student organizations because of the benefits gained. We have been using a freshman student listserv and hope to establish a freshman student advisory board next year.

- Hopefully the inclusion of more hands-on project work in the freshman curriculum will also help to familiarize students with engineering disciplines.

- Assistance with career planning and department selection is an area we hope to incorporate in academic advising; especially many students at this stage are not sure what kind of engineering they are interested in. We continue to promote internship opportunities in the learning community and through the freshman listserv.

- The survey indicates that students need ongoing help in adjusting to college. Perhaps more needs to be done in other classes and co-curricular activities in addition to the ENGR 195 class (which most students take in the fall semester).

- Retention data for students entering during the 2002/2003 academic year is found below. It is clear that the data about these entering students is less than satisfactory. Assessment will be done in the future to better determine what practices and programs positively affect retention.

Retention Statistics for
Students Entering Freshman Engineering during 2002-2003 Academic Year
As of June, 2006

Academic Standing	Beginners	Transfers Other Schools	IUPUI Transfers	EDDP
Graduated or at Senior Status in Engineering	12	31	18	9
Still in Engineering at Freshman – Junior Level	2	3	7	2
Known to have Transferred to Another University	5	3	1	2
Graduated from or Enrolled in Technology	4	3	9	
Graduated from or Enrolled in a Major other than Engineering or Technology	5	4	8	9
Dropped Out	25	31	16	7
Total	**53**	**75**	**59**	**29**
Percentage Retained in Engineering	**26.41%**	**45.33%**	**42.37%**	**37.93%**

Retention Summary
Percentages of Students Retained in Engineering

Admission Category	Students Entering 1999-2000 % Retained	Students Entering 2000-2001 % Retained	Students Entering 2001-2002 % Retained	Students Entering 2002-2003 % Retained
Beginners	35.19	45.24	40.62	26.41
Transfers from Other Schools	51.43	42.57	53.52	45.33
IUPUI Transfers	55.56	69.57	53.66	42.37
EDDP	37.14	40.0	30.58	37.93
Overall Retention (All Students)	**45.12 (n = 195)**	**40.82 (n = 196)**	**45.79 (n = 214)**	**38.88 (n = 216)**

DEPARTMENT OF MECHANICAL ENGINEERING 2006 ASSESSMENT REPORT

ME Assessment Web Site: http://www.engr.iupui.edu/me/fassessment.shtml

Prepared by: H.U. Akay and Jie Chen

July 19, 2006

Preamble

A program assessment process has been in place in the Department of Mechanical Engineering since fall 2000 for continuous evaluation and improvement of its undergraduate program. This process has been guided by the requirements of the Accreditation Board for Engineering and Technology (ABET) together with the assessment processes of IUPUI and the School of Engineering and Technology. Our Program Outcomes that outline the knowledge and skills our students are expected to acquire by the time of graduation have been made to be consistent with the IUPUI Principles of Undergraduate Learning (PULs) – a set of campus-wide adopted principles which describe the fundamental intellectual competence and cultural and ethical awareness that every graduate of an IUPUI baccalaureate degree program should possess. Therefore, monitoring our program outcomes results in monitoring the PULs simultaneously.

The department has received a full re-accreditation of its mechanical engineering degree till 2011 from the engineering and technology accreditation body, ABET. The assessment process and tools developed have been effective in receiving this accreditation without any shortcomings.

The department has also undergone a successful IUPUI Program Review in fall 2006, for which a self-study report was prepared (see http://www.engr.iupui.edu/me/mepr/ssr.shtml). The team of experts that reviewed our undergraduate, graduate, and research programs has noted a number of positive changes in our programs since 1998 and made some recommendations for improvement. Currently, we are analyzing the recommendations made and preparing a collective response to the report received.

Assessment Tools

As indicated in our previous reports, the tools that we have in place to assess the effectiveness of our program for the last six years and to make changes when needed fall into direct and indirect evidence categories:

1. Course learning outcomes surveys in all courses conducted at the end of each semester to determine self-assessment of students on how well the course outcomes are met
2. Exit surveys on program outcomes conducted at the time of graduation to obtain self-assessment of the graduates on how well the program outcomes are met
3. Annual student satisfaction survey conducted annually to determine student satisfaction with the program
4. Undergraduate Student Advisory Board that provides input on student satisfaction and needs
5. Alumni survey for measuring the impact of program outcomes in the performance of graduates

The tools in the direct evidence category consist of:

1. Industrial Advisory Board that provides input on performance and expected qualifications of graduates
2. Employer survey for measuring effectiveness of the program outcomes in the work force
3. Fundamentals of Engineering (FE) exam results on students who take it in their senior year. This is a standardized national exam, which gives comparisons of our students' sores against the national averages
4. Feedback forms for course outcomes survey results completed and submitted at the end of each semester by the faculty teaching the courses

5. Jury evaluations in key courses that involve final project reports or presentations in front of an audience of faculty, industry guests, and fellow students
6. Instructor's assessment of student performance in course outcomes via evaluation of key exams, projects and homework against the course outcomes
7. Industry feedback of performance of our coops and interns. A new process has been initiated at the School level, which is expected to give good data on our student's performance in the workplace

Collection and assessment of these data are continuing and the appropriate enhancements are being made regularly.

Recent Results and Changes

With the assessment measures that are in place, we are continuously monitoring the effectiveness of the curriculum established in fall 2003. The following are the findings in 2005/06:

1. Results of Course Learning Outcomes Surveys conducted each semester show a steady trend, with overall averages meeting well our threshold of 3.75 out of a scale of 5 as shown in Figure 1. The 3.75 threshold corresponds to the mid point between good and very good. More specifically, in 11 out of 12 semesters we meet this criterion. In addition to this, our goal is to keep at least 70% of approximately 300 course learning outcomes stay above the 3.75 threshold. The results show that this goal has not been met consistently. Only in 5 out of 12 semesters this criterion has been reached, while three additional are close. We will be working towards obtaining better results in this category.
2. The Exit Surveys given to graduating students on program outcomes showed that the expected improvements in the fall 2003 curriculum are mostly being met. The overall average score remains steady (Figure 2). The 3.75 and 70% goals have been easily met in all surveys conducted since spring 2001. We are closely monitoring the outcomes of the new thermal design and statistics courses that have been instituted in the new curriculum.
3. One of the key courses in the curriculum is *ME 462 Capstone Design* course which is a synthesis of all the knowledge gained by the students throughout the entire curriculum. The students in this course: 1) receive a design assignment (real-world product requirement) defined by a customer (mostly an industrial sponsor); 2) work in a team to come up several candidate solutions; 3) analyze the alternatives and choose the best design; 4) create a computer or physical model of the design; 5) test the design for functionality and meeting product constraints; 6) write a comprehensive report describing the design process followed including the project management tools used as well as the societal, environmental, and safety aspects of their design; 6) present the results to fellow students, faculty, and industry guests at the end of the semester; 7) are evaluated by a jury of faculty and industry sponsors. The jury evaluation results received, which are summarized in Table 1, showed that all of the outcomes of the course met successfully. The written reports are also evaluated by a jury of three faculty members, the results of which are summarized in Table 2, showing consistently good scores. Slight drop during the recent years is attributed to more stringent report writing and presentation requirements we have imposed in response to the recommendations made by ABET.
4. The student satisfaction survey results led to:
    a) Implementation of a team report writing format in experimental labs, giving more time to students in conducting the experiments and interpreting the results. A peer evaluation mechanism is added to the grading of the reports.
    b) More tutoring sessions have been instituted for lower level courses in the curriculum.
    c) More emphasis has been placed upon co-op, internship, and job placement services.
5. Jury evaluation of capstone design projects led to:

a) More emphasis on impact statement requirements in the design presentations and reports (impact of the design on society, safety, environment, etc.)
b) More use of project management tools, such as Microsoft Project, in design projects.

6. Course outcomes surveys led to:
   a) Addition of formal recitation hours in key sophomore level courses for solving more examples.
   b) Revision of the lab experiments in ECE/ME 340 course.
   c) Emphasis on solving more examples in the class.
   d) Addition of design of experiments components to selected experiments in experimental lab courses.

Summary

The assessment has been an on-going process in the Department of Mechanical Engineering. Various tools developed provide valuable feedbacks to the department. The feedbacks are carefully evaluated. Improvements are made accordingly, which are also assessed continuously using the built-in assessment mechanism. This closed-loop process that is in place ensures the competitiveness of our undergraduate program and benefits the economic and intellectual development of the society.

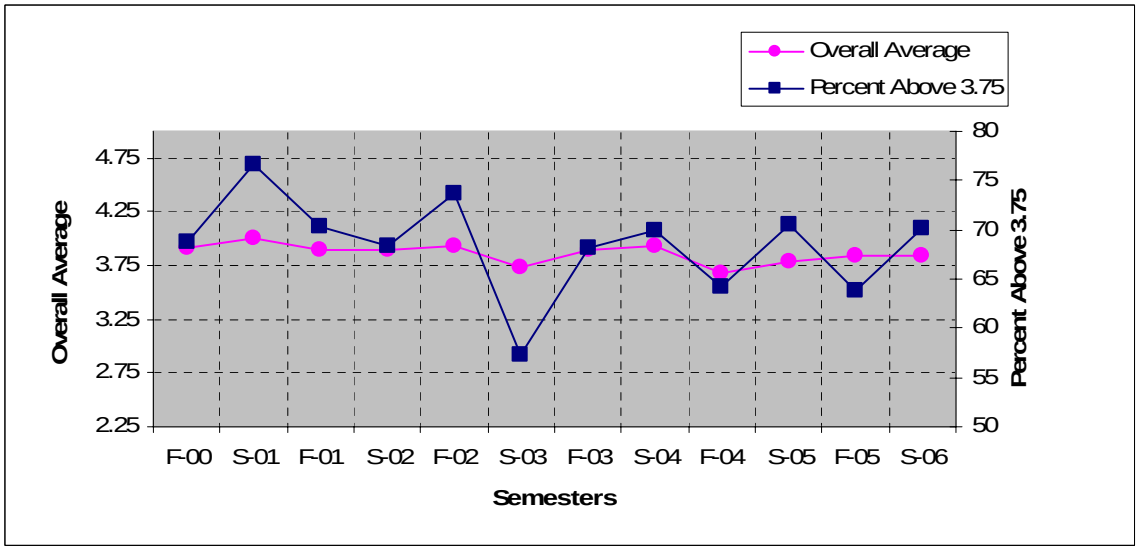

Figure 1. Analysis of Course Learning Outcomes Survey results

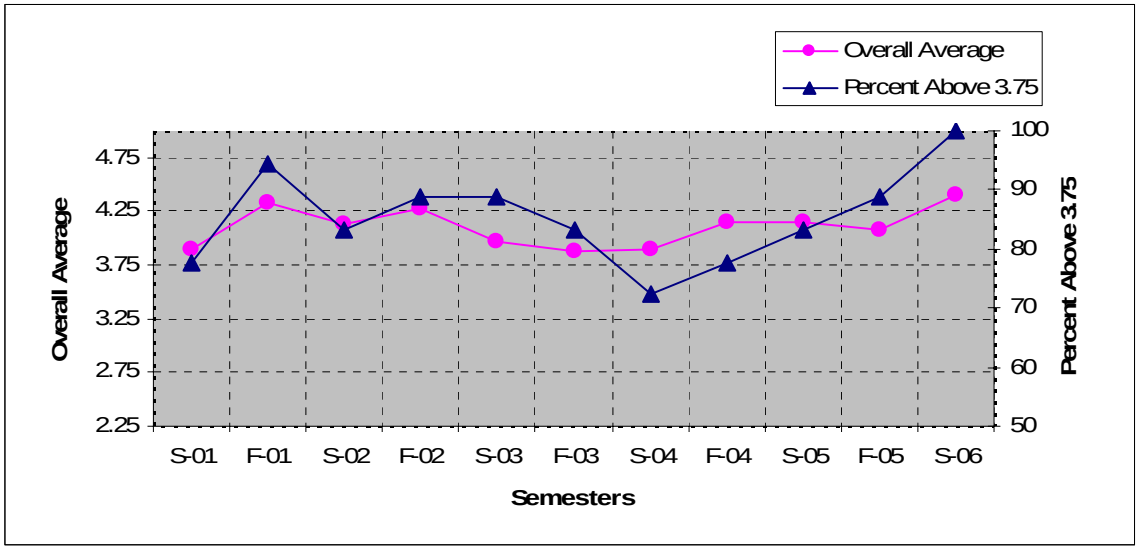

Figure 2. Analysis of Program Outcomes (Exit) Survey results

Table 1. Jury evaluation results of *ME 462 Capstone Design* course

Items	*Spring '02 N = 15*	*Fall '02 N = 44*	*Spring '03 N = 19*	*Fall '03 N = 34*	*Spring '04 N = 64*	*Fall '04 N = 33*	*Spring '05 N = 43*	*Fall '05 N = 29*	*Spring '06 N = 39*
***1. Project Objectives** [g]*	***4.07***	***4.32***	***4.05***	***4.41***	***4.42***	***4.29***	***3.90***	***3.97***	***3.78***
***2. Creativity and Originality** [e]*	***3.60***	***4.25***	***4.22***	***4.00***	***4.05***	***4.06***	***3.93***	***3.93***	***3.90***
***3. Use of Engineering Principles** [c, a4]*	***3.60***	***4.05***	***3.95***	***4.22***	***4.00***	***4.00***	***3.78***	***3.93***	***3.63***
***4. Impact of the Design on Safety, Environment, and Society** [h, j]*	***3.62***	***4.01***	***3.67***	***4.06***	***3.78***	***3.85***	***3.91***	***3.67***	***3.82***
***5. Professionalism and Team Work of the Design Group** [d, f]*	***3.80***	***4.24***	***4.21***	***4.18***	***4.14***	***4.37***	***4.12***	***4.10***	***3.95***
***6. Effectiveness of the Presentation** [g]*	***4.07***	***4.07***	***4.16***	***4.10***	***3.98***	***3.91***	***4.01***	***3.83***	***3.72***
***7. Life Long Learning and Ethical Aspects** [i]*	***3.60***	***4.02***	***3.63***	***3.83***	***3.70***	***3.56***	***3.52***	***3.36***	***3.67***
***8. Overall Quality** [c]*	***3.60***	***4.20***	***4.21***	***4.35***	***4.14***	***4.12***	***4.12***	***4.00***	***3.99***
9. Overall Average (computed)	***3.74***	***4.14***	***4.01***	***4.14***	***4.03***	***4.01***	***3.92***	***3.85***	***3.81***

Note: All items are scored by the jury using a scale from 1 through 5, with 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent. The bold letters in brackets indicate program outcomes.

The letters within the brackets indicate the general program outcomes of mechanical engineering. See http://www.engr.iupui.edu/me/funderoutcomes.shtml.

Table 2. Evaluation of project reports of *ME 462 Capstone Design* course by a jury of three faculty members

Semester	**Score on Technical Merit**	**Score on Writing Quality**
Spring 2003	87/100 = 4.35/5	86/100 = 4.30/5
Fall 2003	78/100 = 3.90/5	82/100 = 4.10/5
Spring 2004	90/100 = 4.50/5	88/100 = 4.38/5
Fall 2004	90/100 = 4.50/5	88/100 = 4.40/5
Spring 2005	91/100 = 4.55/5	89/100 = 4.45/5
Fall 2005	90/100 = 4.50/5	84/100 = 4.20/5

DEPARTMENT OF ORGANIZATIONAL LEADERSHIP AND SUPERVISION 2006 ASSESSMENT REPORT
Prepared by Tim Diemer and Cliff Goodwin
June 29, 2006

Overview

During the 2006 academic year the Department of Organizational Leadership and Supervision [OLS] demonstrated the commitment of to best practices and monitoring the IUPUI Principles of Undergraduate Learning by evaluating and applying traditional and innovative assessment techniques. The initiative implemented during 2005, an assessment workshop for associate and full-time faculty, the development of a standard format to report assessment results semester by semester by Tim Diemer, the project to development of honors classes within the Purdue School of Engineering and Technology (Charles Feldhaus) were applied and additional data was evaluated. The following sections outline the outcomes of the initiatives executed during 2004 – 05 and discuss current assessment, objectives, and potential outcomes of changes to the OLS department since the last report.

Evaluation of Previous Assessment Initiatives

As of June 2006, the OLS department maintained more than 25 part-time and 5 full-time faculty members instructing a rich curriculum including over 24 undergraduate and 3 graduate courses, with two stand-alone certificates, an associates degree, and a new 124 credit BS in Organizational Leadership and Supervision. The strategy of monitoring and assessing learning consistently across all sections of OLS classes is embedding the IUPUI Principles of Undergraduate Learning [PUL] into all instructional objectives.

During 2005, the associate faculty met the challenge of providing assessment data to help determine if the department achieved its ongoing objective of imbedding the PUL approach in classes required by ABET accredited programs and coursework mandated by the OLS Core. At the 2005 Workshop, Tim Diemer presented assessment training designed to double the efforts towards consistency between sections and emphasized the standard reporting format developed by Rob Wolter designed to generate quantitative assessment data. Although participation in the new assessment reporting procedure has required some monitoring, the increased awareness of the PUL approach and the new assessment reporting process has revealed the need for lead to several changes to the Bachelor of Science POS (*discussed later*).

Previous department improvements and initiatives were assessed at a spring 2006 department meeting. An ongoing evaluation of student performance at the senior-level continues to mandate further modifications to the OLS curriculum even after implementing processes intended to increase student performance in the capstone project, OLS 490. Student visits to the Technical Writing Center and University Writing Center increased upon implementation of this requirement, but a complete analysis of PUL assessment data evolving from the transition from OLS 100 through OLS 490 is not complete. Rob Wolter and the other OLS 252 and 274 instructors continue to modify their teaching to provide students with early experience in communicating core principles necessary for success at the senior level. The vast number of modifications to advising practices, communication requirements, the fall 2006 (4068) BS POS, and other department policies initiated in the spring of 2006 evolved as a result of the new assessment practices and policies for student performance implemented during 2004 – 2005. Ongoing improvements in this area carried over from 2005 include:

- Requirement for OLS 490 students to submit a rough draft of their Senior Research Project for assistance with format, language, grammar, citations, spelling, and other input to conform to the rubric revised by Stephen Hundley.
- Scheduling regular appointments with the OLS course instructors (either Cliff Goodwin or Stephen Hundley) to evaluate progress on the capstone project.
- Applying PUL assessment data, the department continuously analyzes the skills mastered from the 200 to the 300 to the 400 level course offerings. The process is part of monthly departmental meetings and the 100-level introductory course was added to this strategy during 2006.

A new handout was developed to offer potential honor students this option for their plan of study in the Purdue School of Engineering and Technology. This initiative, led by Charles Feldhaus, is based on the PULs and permits students in standard sections to be evaluated at the honor's level based on a rubric assessing competence in categories 1, 2, and 4. Investigation revealed that participation at the honor's level does not match that of other schools (specifically the School of Science) demonstrating further need for promotion of this academic opportunity.

Timothy Diemer, assistant professor in the department, continues to travel internationally to assess the School's standing among global institutions of higher education. The content of his OLS 327: Leadership in a Global Workforce is significantly enhanced by his connectivity and participation in workshops and implementation of global education initiatives with Dr. Oner Yurtseven on behalf of the School of Engineering and Technology. Given the increasingly global nature of most organizations in the Indianapolis community, this course has become a cornerstone to the OLS BS Core Curriculum – augmenting other best-practice projects throughout the department.

2006 Assessment, Initiatives, and Potential Outcomes

In 2006, the OLS department set in motion a series of major improvements designed to significantly and positively impact all six IUPUI Principles of Undergraduate Learning:

Communication

The assessment of a student's ability to demonstrate communication skills through written work, reading and applying leadership principles, active speech/listening, analysis, and using information resources from OLS 252 through OLS 490 revealed that some OLS students (in relation to PUL 1) are not competent at expressing ideas, facts, or concepts into written format nor can they utilize and analyze scholarly resources effectively. As a direct result of this assessment the OLS department implemented the following:

- Requirements for the 4068 POS require 5 mandatory communication courses – one of which must demonstrate a research writing component in professional/business format including abstracts, literature reviews, APA citations, qualitative and quantitative analysis, primary and secondary research, and peer review. Both TCM 320 and ENG W-231 meet the requirements for the new communication core.

- A total of 24 credit hours in communication-related coursework will build the new POS. OLS 474, Conference Leadership, will compliment the oral communication skills introduced in COMM R-110. The balance of communication electives will complete the requirement with the potential outcome of improving performance in all 300 and 400-level OLS work.

Analysis and Critical Thinking

OLS students must demonstrate their ability to evaluate the relevance of data and research, synthesize diverse concepts and leadership practices, and use the knowledge gained to explore multiple perspectives – thus developing their own leadership philosophy by the time they reach OLS 390. To encourage the analysis of complex issues and encourage students to demonstrate PUL 2 skills early in their academic career, the department and course coordinators implemented the following strategies:

- Standardize exams and papers (synthesis of opinion and secondary research) at the 100 and 200-level. OLS 274 coordinator Rob Wolter modified the coursework to include both group and individual work designed to test student's ability to analyze course material and demonstrate critical thinking both orally and in written format.
- Advisors are enforcing the prerequisites for OLS 327 and 390 to guarantee students gain practice both in communication and critical thinking before they reach junior standing in the BS program.

Learning Needs Assessment

Many OLS students are returning adult students or transfer students from other institutions in Indiana. A majority of the OLS student body works part or full time and integrates their academic careers with professional and community obligations. To meet the needs of this unique group, the OLS department adopted the following initiatives:

- Development of Online sections of all Core Required OLS coursework is currently underway.
- Evening, non-standard length, and hybrid sections for many OLS Core requirements have been or are currently under construction.
- Due to the independent nature of the OLS Senior Research Project, the Project Management course (OLS 371) will now replace Labor Relations in the Major Core to prepare students to plan, control, and complete major projects effectively.
- Degree progress is monitored prior to any course permissions and all OLS AS and BS student transcripts are audited prior to enrollment in OLS 390, the prerequisite for all senior coursework.

Interdisciplinary Studies

A balance curriculum encourages students to participate in learning across multiple disciples. Both the old and the new BA POS support PUL 3 as do the following new initiatives:

- Partnership with Joshua Killey to grow the internship program and place more OLS students into professional work experiences.
    - Continuous assessment at the 410/490-level to evaluate student ability to draw from life and education at multiple levels in the interpretation of research on a specific organizational topic demonstrating a higher level of understanding and the ability to draw reasonable conclusions for broader applications.
    - Improved articulation with Ivy Tech to utilize more of the credit hours outside of the OLS core to fulfill a student's outside interests will complete the Applied Technology Requirement and elective section of their POS.

Broader Understanding (PUL 5 & 6)

Again at PUL 5 & 6, the OLS department's push for interdisciplinary studies, global understanding of organizational concepts and problems, and application of problem-solving skills must be demonstrated at the junior and senior level of study. Loosely connected to the concepts of situational problem-solving is the ability to anticipate problems, recognize potential barriers, and demonstrate the ability to modify behavior to reach one's goals. Students in OLS will have the opportunity to practice this approach as they learn to adapt to more stringent graduation standards:

- Students must achieve at least a C in every OLS Major Core course to meet graduation requirements: (OLS 100, 252, 263, 274, 331, 368, 371, 390, 410, & 490).
- To avoid delay in graduation, students must complete math requirements, general education requirements, and prerequisite OLS coursework prior to registration for OLS 390 (an audit of the student's progress report must be performed prior to registration at this level).
- The requirement for 18 credits in a single technology has been removed, but students are still advised to pursue a minor or certificate in their area of greatest interest.

Application of Values and Ethics

Students do not always demonstrate an ability to make good academic judgments with respect to individual conduct. Department research (300 and 400-level instruction) revealed multiple examples of poor applications of ethics in the documentation of sources consulted during secondary research. As a direct result of several confirmed and suspected cases of plagiarism, the department implemented the following:

- Training on proper citation and documentation at the 100 and 200-level as well as changes to the Communication Core requirements (see above) will help students avoid potential problems by teaching synthesis skills and recognizing the value of giving credit to the subject-matter experts for their area of study.
- Training of part-time and full-time faculty to handle misconduct and follow the University Guidelines will be part of the semi-annual workshops.

General OLS Program/Department Improvements & Initiatives

New POS for Bachelor of Science in OLS designed to increase communication and project management skills and create a balanced curriculum.

Course-level Performance Assessment in the required curriculum including OLS 252/OLS 274 (subject to ABET accreditation) and OLS 410 and OLS 490 will be continued to analyze the effectiveness of the new POS and faculty training.

New Articulation Agreement to allow students to translate their Associates degree into a BS in OLS – creating a more flexible learning environment.

Proactive Advising with links to External Schools and Institutions feeding the department with enrollment opportunities and prospective BS candidates – Ivy Tech, General Studies, UCOL

Updated Staff Position – PA Assistant to the Chair to provide a high-level of faculty support, implement and analyze current OLS improvements and coordinate assessment by follow-up and integrated communication between part-time faculty, full-time faculty, the department chair, and the students.

Narrative Evaluation of Assessment by Full-time Instructors *(from 2006 OLS – ICHE Report)*

400-Level Courses – S. Hundley

Assessment measure: *Manager's Bookshelf* in-class discussions
Situation: Students were frequently unprepared to be active discussants of assigned readings
Decision: Required 1-2 page Executive Summary for each week, resulting in improved in-class discussions of *Manager's Bookshelf* readings

Assessment measure: Knowledge of *Practical Research* text concepts
Situation: Students were assigned readings from the *Practical Research* text, but were unable to sufficiently demonstrate knowledge acquired
Decision: Required in-class essay-based test on *Practical Research* text concepts, resulting in 100% of the class earning a C or higher on the test.

Assessment measure: Application of *Practical Research* text concepts
Situation: Students were unable to demonstrate application of knowledge from *Practical Research* text concepts
Decision: Integrated *Practical Research* application exercises into group-based strategy project, resulting in improved quantity and quality of investigation methods used, analyses conducted, and sources cited

Assessment measure: Knowledge of *Strategy* text concepts
Situation: Students were assigned readings from the *Strategy* text, but were unable to sufficiently demonstrate knowledge acquired
Decision: Required in-class essay-based test on *Strategy* text concepts, resulting in 100% of the class earning a C or higher on the test.

Assessment measure: Application of *Strategy* text concepts
Situation: Students were unable to demonstrate application of knowledge from *Strategy* text concepts
Decision: Developed a group-based project and paper to apply knowledge of *Strategy* text concepts, resulting in more robust information retrieval, analyses, interpretation, and forecasting of strategic leadership principles

Assessment measure: Suitable progress made in completion of OLS 490 *Project* in timely manner
Situation: OLS 490 students frequently deferred completion of *Project* beyond the semester in which the student initially enrolled, frequently due to poor time management
Decision: Hired a teaching assistant to help students with project components and required more frequent drafts of writing submissions earlier in the semester, resulting in over 80% of students completing OLS 490 in the semester in which initially enrolled

OLS 263, 390, & Graduate OLS Courses – C. Feldhaus
Assessment measure: Add Case Study for Mid-Term Exam in OLS 263
Situation: Two semesters (Fall of 2005 and Spring of 2006) of common Mid-Term Exams were given in online sections of OLS 263
Decision: Administer common Mid-Term Exam to all sections of OLS 263

Assessment measure: Comprehensive Final Exams in OLS 390
Situation: Three semesters of common Comprehensive Final Exams were given in online sections of OLS 390
Decision: Administer common Comprehensive Final exam to all online sections of OLS 390

Assessment measure: Mid Term and Final Exams in OLS 580

Situation: Spring 2006 was the first semester for offering OLS 580: Interpersonal Skill for Leaders (offered as Tech 581 course).
Decision: Administer common Mid-Term and Final Exam for this course and track results

OLS 252 and 274 – (ABET Accredited Courses) – R. Wolter
Assessment measures and changes made

Assessment measure: Final Exams in OLS 252
Situation: Three semesters of common final exams were given in three sections of OLS 252
Decision: Administer common final exam to all sections of OLS 252

Assessment measure: Final Exams in OLS 252
Situation: OLS is uncertain regarding initial student competency\mastery of OLS concepts
Decision: Administer pre-test and post-test final exam to selected sections of OLS 252

Assessment measure: Final Exams in OLS 274
Situation: Three semesters of common final exams were given in one section of OLS 274
Decision: Administer common final exam to all sections of OLS 274

Assessment measure: Study Guides used for test preparation in OLS 274
Situation: "Survival Guides" (ten questions drawn from 16 chapters) were assigned weekly
End of semester study guide was developed from the Survival Guides
Student performance on final exam was better than predicted
Decision: Use "Survival Guide" approach in OLS 252 classes as well

Assessment measure: OLS 274 final project writing assignment
Situation: OLS 410 and 490 students were unprepared for capstone project writing assignment
OLS 274 students participated in series of unrelated writing assignments
Decision: Have final project writing assignment resembling OLS 490 capstone project
Have series of low stakes writing assignments as incremental steps
Require collection of assignments to accompany final project writing assignment
Assessment measure: Class room participation in OLS 252 and 274
Situation: Students were unprepared for class room discussion
Decision: Required weekly chapter quizzes were developed for Oncourse

Assessment measure: Class room participation in OLS 252 and 274
Situation: Students were unprepared for class room discussion
Decision: Required weekly chapter quizzes were developed for Oncourse

TECHNICAL COMMUNICATIONS 2006 ASSESSMENT REPORT
Prepared by Becky Fitterling
Spring 2006

EXECUTIVE SUMMARY

The Technical Communication Program evaluated the communication skills of 72 students in the spring of 2006. Twenty-four engineering students in TCM 360 were evaluated on their oral presentation skills on their final presentation of the semester by an outside jury. In addition, 18 of those students' final written reports were evaluated by their instructor using a holistic rubric. A panel of three TCM instructors evaluated the final written products of 29 technology students in TCM 220. In TCM 370, TCM faculty observed presentations of 19 students. In all cases, the goal was bifurcated: to have 70% or more of the students average at least 3.5 (on a 5-point scale) and to have the average of the separate criteria each average at least 3.5. The engineering results were good, with 81% of the students scoring 3.5 or above and 100% of the criteria averaging at least 3.5. Technology results are improving: the writing skills of the TCM 220 students showed 70% of the students performing at 3.5 or better, and 83% of the criteria averaging at least 3.5. In the oral presentations of TCM 370, 74% of the students averaged 3.5 or better, and 85% of the criteria averaged at least 3.5. Efforts will continue to be made for course improvement, especially in the areas of visual communication, use of sources, and in the nature of workplace writing.

ENGINEERING ASSESSMENT

TCM 360, Oral Presentations

Process:

The assessment process for the School of Engineering concentrated on the final oral presentations that the students delivered in TCM 360, Communication in Engineering Practice. Jurors from the students' disciplines were invited to attend the students' final oral presentations. Using a rubric judging 13 specific criteria of the presentation plus one criterion of "Overall Impression," the jurors scored each of the criteria on a scale of 1-5. In the spring semester, a total of 24 students were evaluated, 18 ME students and six ECE students. No BME students were assessed.

We varied the jury process a bit for spring semester, based on the fact that a total of seven (7) class periods had been set aside for presentations. Worried that organizing the students randomly and inviting any E&T faculty to attend would cause problems, we instead organized the students by their majors. The assumption was that at least the faculty of the major would find it possible to attend. Unfortunately, we had no outside jurors on either day when the BME students gave their presentations, and as a result, we have no data for BME. The ECE data are likewise light, with only six students' results. Furthermore, although the ME students were judged solely by ME faculty, the ECE students were evaluated by one ME professor and one ECE professor. (These details will be addressed later.)

The criteria (categories) assessed were Introduction, Content, Data and Analysis, Conclusion, Organization, Visuals, Language, Length, Grammar, Delivery, Pace & Volume, Body Language, Q&A, and Overall Impression.

The goal of the assessment was two-fold: (a) 70% or more of the students would achieve an overall average score of 3.5 or higher; and (b) 70% or more of the criteria would be judged at 3.5 or higher.

Results:

For the spring semester, the goal of 70% or more of the students averaging 3.5 was, in fact met; overall, 81% of the students met that goal. In terms of the criteria, all were judged at 3.5 or higher, meaning a 100% accomplishment. "Visuals" is the category that continues to show the most weakness.

The combined results are shown in Table 1.

Table 1: TCM 360 Juried Presentation Scores, ME and ECE

	Average	#>3.5	%>3.5	Av>3.5	70%>3.5	Either?
Introduction	3.8	20	83%	Y	Y	Y
Content	3.8	21	88%	Y	Y	Y
Data	3.8	18	75%	Y	Y	Y
Conclusion	3.7	20	83%	Y	Y	Y
Organization	3.8	19	79%	Y	Y	Y
Visuals	3.6	13	54%	Y	N	Y
Language	3.9	20	83%	Y	Y	Y
Length	3.9	21	88%	Y	Y	Y
Grammar	4.0	22	92%	Y	Y	Y
Preparation	4.0	20	83%	Y	Y	Y
Pace & Volume	3.9	19	79%	Y	Y	Y
Body Language	3.8	18	75%	Y	Y	Y
Q&A	4.0	21	88%	Y	Y	Y
Overall Impression	3.9	17(/20)	85%	Y	Y	Y
Average	3.8	19.4	81%			

Details of the data broken out by major are contained in Appendix 1.

Analysis:

The scores on the presentations were very high this semester, indicating a continuing positive trend. A couple of new factors may have contributed to the positive outcomes. First, as mentioned before, the students giving the presentations on the same day all had the same majors. For the most part, that change meant that their jurors represented the students' department. One could assume that the jurors were thus predisposed to react more positively to their students than when they evaluate students that they may not know or associate with their departments.

The ME students were judged exclusively by ME professors. In the case of the six ECE students, two jurors participated, one from ECE and one from ME. The ME juror scored consistently tougher than the ECE juror, and it would only seem reasonable that a more diverse audience would give a broader range of scores.

Second, the participation of faculty was limited this semester. Our jurors numbered only seven this semester, and several students were evaluated by only one juror. Of the seven jurors, all but one were from ME, and no one from the BME faculty attended. The emphasis that the ME chair puts on assessment clearly shows in these numbers. Understanding that the invitations to attend the presentations come at a fairly frantic time for everyone in the semester, we may have to re-evaluate how to make the assessment process work for both students and faculty alike.

The new assessment form seems to be working well.

Actions Taken:

As previously mentioned, we changed the organization of the presentations this semester, with rather mixed results. We may need to look at how we go forward with this procedure in the future to try to balance fairness to the students with demands on the faculty's time.

ENGINEERING ASSESSMENT

TCM 360, Written Final Reports

Process:

This semester, in addition to the juried oral presentations, one instructor did an analysis of the students' final written reports in terms of the holistic rubric used in the final evaluations of their reports. Although the rubric has ten categories, only nine of them applied because the students did not take the option of using an appendix. The categories were scenario memo, introduction, analysis, reasoning, implementation, design and visuals, sentences, mechanics, and reflective memo. (A copy of the rubric is in Appendix 2.)

Using a scale of 5-4-3-2, the instructor assigned a value for each of the criteria used when evaluating the paper. Because a maximum of 45 points was possible, the goal of 70% of the students scoring a 36 or better (calculated as 80 % of 45, the lowest possible B) was set for the class. In addition, the average score of 3.5 on each of the criteria was also set.

Results

The final recommendation reports of 18 TCM 360 students were evaluated. Seventy-two percent (13 students) scored more than 36 points, including two students whose scores were rounded up from 35.5. The class average score was 37.1. All criteria attained an average of at least 3.5 as well. Generally, then, the students have succeeded in meeting the expectations of their written reports. Table 2 details the data.

Table 2: Results of Instructor's Holistic Evaluation

TCM 360 Written Report - Instructor's Evaluation																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	AV
Scenario	5	4	5	5	4	4.5	3.5	5	4	4	5	5	4	4.5	5	5	0	5	4.3
Introduction	5	3.5	3.5	5	4.5	5	4	5	4.5	3.5	4.5	3	3	4	4	3	3	5	4.1
Analysis	4	4	4	5	4	4	4	4.5	4	3.5	5	4	3	4.5	4	3	4	4	4.0
Reasoning	4	3	4	5	4	4	3.5	4.5	4	4	5	3.5	3	5	3.5	3	3	5	3.9
Implementation	4.5	3	5	5	3	4	3.5	4.5	4.5	4	4	3	2.5	4.5	3	3	3	4	3.8
Design/Visuals	4.5	3	4	4	4	4.5	4	3	4	4	5	4	2	4	4	3	5	4	3.9
Sentences	5	4	4	5	3.5	4	4	5	5	3	4	4	4	4	4	2.5	3	4	4.0
Mechanics	5	4	3.5	5	4	4	4	4	4.5	3	5	4	4	4	4	3	4	5	4.1
Reflective	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	4.9
Total /45	42	33.5	38	44	36	39	35.5	40.5	39.5	34	42.5	35.5	30.5	39.5	36.5	30.5	29	41	37.1

Analysis

Although delineating the scores on the rubric does not necessarily constitute a rigorous scientific approach to evaluation, the results do give the instructor an idea of where improvements can be made in teaching the written recommendation report. For example, the aspect of "implementation" presents itself as one needing some attention, as does the design of the document itself.

Actions Taken:

Evaluating the written products has historically taken a back seat to the oral presentations. A more rigorous system for evaluating the written reports may need to be devised.

TECHNOLOGY ASSESSMENT

TCM 220 and TCM 370

Overall Process:

Technology assessment for fall semester concentrated on two of the core TCM classes for the technology students, TCM 220, Technical Report Writing, and TCM 370, Oral Practicum for Technical Managers.

TCM 220

Process:

A panel of three TCM instructors did holistic evaluations of 29 final TCM 220 papers of spring '06 students. The students were picked randomly from all of the TCM 220 classes, including the online classes, a total of 10 sections of TCM 220.

Using a rubric of 12 criteria, we set as a goal to have 70% of the students achieve an average score of 3.5 or above, and 70% of the criteria to be evaluated at least 3.5. This rubric is the one we revised last semester.

The criteria were Introduction, Content, Data & Analysis, Conclusion, Organization, Visuals, Layout, Language, Length, Mechanics, Sentence Structure and Credit for Sources.

Results:

The results of the assessment for spring semester were very encouraging. In terms of the criteria, all but two of the criteria averaged 3.5 or higher, meaning an 83% accomplishment. The two categories that did not average 3.5 were Visuals and Credit for Sources. Furthermore, 20 of the 29 students averaged over 3.5 on their results. Rounding 68.96% to 70%, we can declare success meeting that goal as well. Table 3 details the results of all of categories.

Table 3: TCM 220 Final Products Juried Evaluation

	Average	# ≥ 3.5	% ≥ 3.5	Avg ≥ 3.5?	70% ≥ 3.5?	Either satisfied?
Introduction	3.6	20	70%	y	y	y
Content	3.8	20	70%	y	y	y
Data	3.6	22	76%	y	y	y
Conclusion	3.7	21	72%	y	y	y
Organization	3.7	18	62%	y	n	y
Visuals	3.3	8/17	47%	n	n	n
Layout	3.6	18	62%	y	n	y
Language	3.9	23	79%	y	y	y
Length	3.6	18	62%	y	n	y
Mechanics	3.6	18	62%	y	n	n
Sentences	3.8	22	76%	y	y	y
Credit	2.4	6/17	35%	n	n	n
Average	3.6	20	70%	y	y	y

Analysis:

The data for TCM 220 show progress. Although we still need to improve our students' mastery of effective visuals and the correct acknowledgment of outside material, we are trending upward. The TCM program's renewed efforts at assessment activities and education of our adjunct faculty seem to be having a positive effect on our results.

Action Plan:

We will continue to share the results of our assessment activities with the faculty, and we will look at new approaches to improve the teaching and learning of visual aspects of reports and of using and acknowledging sources.

TCM 370

Process:

A panel of three TCM instructors reviewed the in-class presentations of 19 TCM 370 students, using the revised rubric for assessing students' workplace oral abilities. Thirteen criteria were measured: Introduction, Content, Data, Conclusion, Organization, Visuals, Language, Length, Grammar, Preparation, Pace & Volume, Body Language, and Q&A.

The goal of the assessment was two-fold: (a) 70% or more of the students would achieve an overall average score of 3.5 or higher; and (b) 70% or more of the criteria would be judged at 3.5 or higher.

Results:

Seventy-four percent (74%) of the students averaged 3.5 or better on their presentations. As indicated in Table 4, all of the criteria except for Visuals and Length met the goal of averaging at least 3.5.

Table 4: TCM 370 Juried Presentations

	Average	# ≥ 3.5	% ≥ 3.5	Avg ≥ 3.5?	70% ≥ 3.5?	Is either satisfied?
Introduction	3.5	11	58%	Y	N	Y
Content	3.7	14	74%	Y	Y	Y
Data	3.5	11	58%	Y	N	Y
Conclusion	3.5	13	68%	Y	N	Y
Organization	3.5	10	53%	Y	N	Y
Visuals	3.4	11	58%	N	N	N
Language	4.0	16	84%	Y	Y	Y
Length	3.4	12	63%	N	N	N
Grammar	3.9	15	79%	Y	Y	Y
Preparation	4.0	14	74%	Y	Y	Y
Pace & Volume	3.9	12	63%	Y	N	Y
Body Language	4.0	16	84%	Y	Y	Y
Q&A*	4.3					
Average	3.7					

Only 10 students were evaluated on this criterion; 9 were over 3.5

Analysis:

Although the numbers in TCM 370 look good, the panel has some concerns, primarily on the subject of the content of the presentations. It is important for us to identify and emphasize the nature of workplace communication activities.

Action Plan:

TCM is currently evaluating the current text book and assignments to determine their suitability for the TCM 370 class.

CONCLUSION:

TCM continues to study the trends and techniques of our assessment activities. We are looking to make some curricular changes in order to better meet the communication needs of our students; these changes will include a broader scope of reports in TCM 220 and perhaps more emphasis on changing communication media.

APPENDIX 1
TCM 360 Results Broken out by Major

Mechanical Engineering

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18	Average	#>3.5	%>3.5	Av>3.5	70%>3.5	Either?
Introduction	3.5	4.0	3.0	3.5	3.5	4.0	4.0	4.0	4.0	4.5	4.0	4.0	4.0	4.0	4.0	4.5	4.0	5.0	4.0	17	94%	Y	Y	Y
Content	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	3.5	4.0	4.0	4.0	4.5	3.5	4.0	4.5	4.0	18	100%	Y	Y	Y
Data	3.0	4.0	4.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.0	4.0	4.0	4.5	4.0	4.0	4.5	4.0	16	89%	Y	Y	Y
Conclusion	3.5	3.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	3.5	3.5	4.5	3.9	17	94%	Y	Y	Y
Organization	4.0	4.0	4.5	4.5	4.0	4.0	5.0	4.0	4.0	3.0	3.0	4.0	4.0	4.0	4.0	3.5	3.5	5.0	4.0	16	89%	Y	Y	Y
Visuals	4.0	3.0	4.0	3.0	4.0	2.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	5.0	3.5	3.5	5.0	3.7	10	56%	Y	N	Y
Language	4.0	4.0	4.0	4.0	4.5	4.0	4.0	4.0	4.0	4.5	4.0	4.0	3.0	4.0	5.0	4.0	4.0	4.5	4.2	17	94%	Y	Y	Y
Length	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	4.5	4.0	4.0	4.0	4.0	4.5	4.5	4.5	4.2	18	100%	Y	Y	Y
Grammar	4.0	4.0	4.0	4.0	4.5	4.0	4.0	4.0	4.0	5.0	5.0	4.0	4.0	4.0	4.5	4.5	4.5	4.5	4.3	18	100%	Y	Y	Y
Preparation	4.0	4.5	3.5	3.5	5.0	4.0	4.0	4.0	4.0	5.0	4.0	3.0	4.0	4.0	5.0	4.0	4.5	4.5	4.2	17	94%	Y	Y	Y
Pace&volume	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	4.5	3.0	4.0	3.0	4.5	3.5	3.5	5.0	4.1	16	89%	Y	Y	Y
Body Language	4.0	4.0	4.0	4.0	3.5	3.0	4.0	4.0	4.0	4.0	4.5	4.0	3.0	3.0	4.5	4.0	4.0	5.0	4.0	15	83%	Y	Y	Y
Q&A	3.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.0	4.0	4.5	4.0	4.5	4.5	4.3	18	100%	Y	Y	Y
Overall Impression	4.0	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				5.0	4.0	4.0	4.5	4.2	15/15	100%	Y	Y	Y
Average	3.8	4.0	4.0	3.9	4.1	3.8	4.1	3.9	4.0	4.4	3.9	3.7	3.8	3.8	4.6	3.9	4.0	4.7	4.1					

means one juror

18 students
7 had only one evaluator
all evaluators from ME

Electrical and Computer Engineering

	#1	#2	#3	#4	#5	#6	Average	#>3.5	%>3.5	Av>3.5	70%>3.5	Either?
Introduction	3.5	3.3	3.5	3.0	2.3	4.5	3.3	3	50%	N	N	N
Content	3.5	2.5	4.5	2.5	3.0	4.0	3.4	3	50%	N	N	N
Data	4.0	3.0	2.8	3.0	3.0	4.0	3.3	2	33%	N	N	N
Conclusion	3.5	2.5	3.5	2.8	2.8	3.5	3.1	3	50%	N	N	N
Organization	3.5	3.0	3.8	2.5	3.0	4.5	3.4	3	50%	N	N	N
Visuals	3.5	2.5	4.0	2.5	3.0	5.0	3.5	3	50%	Y	N	N
Language	4.0	3.5	2.5	2.0	3.3	4.5	3.3	3	50%	N	N	N
Length	4.0	3.5	3.0	2.0	3.0	4.5	3.3	3	50%	N	N	N
Grammar	4.0	3.5	2.8	1.5	3.5	4.5	3.3	4	66%	N	N	N
Preparation	4.0	2.5	3.0	2.0	3.5	5.0	3.3	3	50%	N	N	N
Pace&volume	4.0	3.0	3.5	1.8	3.0	5.0	3.4	3	50%	N	N	N
Body Language	4.0	2.5	4.0	2.3	3.0	4.5	3.3	3	50%	N	N	N
Q&A	3.8	3.0	4.0	2.0	2.5	4.5	3.4	3	50%	N	N	N
Overall Impression	4.0	2.8	3.8	2.3	3.0	4.8	3.4	3	50%	N	N	N
										N	N	N
Average	3.8	2.9	3.5	2.3	3.0	4.5	3.3	3	50%			

6 students
2 evaluators (one ME; one ECE)

APPENDIX 2
ASSESSMENT RUBRICS

Criteria for Assessing Students' Workplace Writing Abilities

Rater's Initials_____ Major of Student _____ Date _____

		Excellent		Good		Weak	N/A
Content	Introduction gives overview and states purpose of document.						
	Content fits purpose and audience.						
	Data and analysis are logical, sound, and sufficient.						
	Conclusion flows from content and brings closure to document.						
	Organization of content is logical and flows smoothly.						
Visuals	Visuals help understanding and are clear, easy to read, and error-free.						
	Page layout is effective and professional looking.						
Presentation	Language used is appropriate.						
	Length is appropriate to audience, situation, and content.						
	Grammar, punctuation, and spelling are consistently correct.						
	Sentence structure is clear and concise.						
	Credit is given for work from other sources.						

Criteria for Assessing Students' Workplace Speaking Abilities

Rater's Initials_____ Major of Student _____ Speaker Number _____

		Excellent		Good		Weak	N/A
Content	Introduction gives overview and states purpose of presentation.	5	4	3	2	1	n/a
	Content fits purpose and audience.						
	Data and analysis seem logical and sound.						
	Conclusion flows from content and brings closure to presentation.						
	Organization of content is easy to follow.						
Visuals	Visuals help understanding and are clear, easy to read, and error-free.						
Presentation Style	Language used is appropriate.						
	Length fits purpose.						
	Grammar is consistently standard.						
	Presentation is well prepared and well rehearsed.						
	Pace and volume are at appropriate levels.						
	Body Language is relaxed with adequate eye contact.						
	Question and answer time is handled well.						
**	Overall Impression	5	4	3	2	1	n/a