PURDUE SCHOOL OF ENGINEERING AND TECHNOLOGY 2010-2011 ACADEMIC YEAR ASSESSMENT REPORT
Prepared by the School's Assessment Committee and Karen Alfrey, Chair
July 1, 2011

Introduction

The Purdue School of Engineering and Technology, IUPUI (E&T) continues its tradition of reporting its outcomes assessment activities by department or (where appropriate) by academic program. The assessment activities of most programs in the school are guided by the discipline-specific accreditation requirements of ABET, Inc. (http://abet.org/, formerly the Accreditation Board for Engineering and Technology), which accredits our engineering, technology, and computing programs; of the National Association of Schools of Music (NASM, http://nasm.arts-accredit.org/), through which the department of Music and Arts Technology is seeking accreditation; and of the Council for Interior Design Technology (CIDA, http://www.accredit-id.org/), the accrediting body for our Interior Design Technology program. The Organizational Leadership and Supervision (OLS) program, which is not accredited at the program level, uses the campus's Principles of Undergraduate Learning (PULs) as their framework for program assessment. Technical Communications offers a certificate program and provides supporting coursework, as well as assessment data on student learning outcomes in those courses, for many of the programs in the school.

School Assessment Processes

The program outcomes defined by ABET, NASM, and CIDA to describe the knowledge, skills, and habits of mind expected of successful graduates of these programs cover the same broad areas as IUPUI's Principles of Undergraduate Learning, but with more specificity appropriate to the needs of each discipline. (ABET outcomes for engineering programs, for example, include several outcomes that could be considered specific examples of Quantitative Skills, one of the PULs.) Thus, by focusing on attainment of discipline-specific outcomes, programs are assured of meeting the more broadly-defined PULs. Each course taught in the school has identified one or more emphasized PULs, as well as any discipline-specific outcomes emphasized in the course. Based on these defined areas of emphasis, specific courses may be targeted for assessment of a given outcome. The campus-level PUL assessment process, which calls for assessing PULs in every undergraduate class on a 5-year cycle, provides supplemental data on learning outcomes and a check on the validity of our program-specific outcomes data. The bulk of program assessment is administered and performed at the department level, with the school assessment committee providing a mechanism for sharing resources and best practices, as well as disseminating information and guidance on new campus-level assessment processes.

Assessment Milestones

In response to a directive from the Indiana Higher Learning Commission during the review of the school's new Energy Engineering program, the School of Engineering and Technology this year established articulation agreements with Ivy Tech for two-year "pre-engineering" sequences, allowing interested students to complete the first two years of the Energy Engineering, Mechanical Engineering, Electrical Engineering, or Computer Engineering degrees at Ivy Tech's Indianapolis campus before transferring to IUPUI. To facilitate ongoing dialogue and to help ensure consistency of the educational experience and of outcomes assessment across both campuses, two Ivy Tech faculty representatives joined the assessment committee this year. This ongoing dialogue will strengthen both the pre-engineering sequence and the articulated technology courses already offered by Ivy Tech.

The Biomedical Engineering (BME), Electrical Engineering (EE), Computer Engineering (CE) and Mechanical Engineering (ME) programs underwent an ABET accreditation visit in September 2010. This was a first accreditation visit for BME; based on the very positive report of the BME program evaluator, we expect the program to receive accreditation following the vote of the commission this summer. The EE, CE, and ME programs, all up for re-accreditation, have already responded to evaluator concerns (including updating their Program Educational Objectives to bring them in line with new ABET guidelines) in a follow-up report. These programs are on-track for re-accreditation by ABET.

The school's Engineering Technology programs, the accreditation of which is overseen by the TAC (technology commission) of ABET, have begun a series of organizational meetings in preparation for their upcoming reaccreditation visit in Fall 2013.

In addition to being submitted to ABET review, copies of the self-studies compiled by all these programs in advance of their accreditation visits are on file in the Dean's Office of the School of Engineering and Technology.

The E&T 2010-2011 Assessment Committee

This year the E&T Assessment Committee was chaired by Karen Alfrey, Director of the Undergraduate Program in Biomedical Engineering. The members of the 2010-2011 committee were the following:

Karen Alfrey, Biomedical Engineering
Mark Atkins, Ivy Tech
J. Bradon Barnes, Ivy Tech
Stanley Chien, Electrical and Computer Engineering
Jerome Clark, Computer and Information Technology
Elaine Cooney, Engineering Technology
Cliff Goodwin, Organizational Leadership and Supervision
Gabe Harley, Technical Communications
Stephen Hundley, Associate Dean for Undergraduate Programs
Alan Jones, Mechanical Engineering
Betty Klein, Design and Communication Technology
Ginger Lauderback, Mechanical Engineering
Roberta Lindsey, Music and Arts Technology
Emily McLaughlin, Design Technology
Janet Meyer, New Student Academic Advising Center
Darrell Nickolson, Design and Communication Technology
Kenneth Rennels, Engineering Technology
David Russomanno, Dean
Jane Simpson, Electrical and Computer Engineering
Sam White, Dean's Office
Bill White, Engineering Technology
Wanda Worley, Technical Communications (on sabbatical Spring 2011)

Departmental and Program Annual Reports for 2010-2011

The 2010-2011 departmental and program assessment reports included in this school report represent the collected works of the following:

Biomedical Engineering (BME)
Construction Engineering Management Technology (CEMT)
Architectural Tech (ART)/Computer Graphics Tech (CGT)/Interior Design Tech. (IDT)
Electrical Engineering Technology (EET) and Computer Engineering Technology (CpET)
Music and Arts Technology (MAT)
Mechanical Engineering (ME)

**DEPARTMENT OF BIOMEDICAL ENGINEERING 2010-11 ASSESSMENT REPORT NARRATIVE
Written May, 2011**

The 2010-2011 academic year saw the Biomedical Engineering (BME) department reach two major milestones and make progress toward several other learning outcomes goals.

Major Milestones
In September 2010, the undergraduate BME program underwent its initial program accreditation visit by ABET, Inc., the accrediting body for engineering and technology programs. Although the official accreditation decision will not be made until the board convenes to vote this summer, the program evaluator's report was highly positive and uncovered no shortcomings significant enough to recommend against accreditation. Importantly, the evaluator found no shortcomings related to the achievements of our students or the quality of their educational experience, and concluded that we are satisfactorily meeting all student learning outcomes ("Program Outcomes" in current ABET parlance). The evaluator particularly noted the excellence of the senior design experience and its emphasis on real-world design concerns. Based on these findings, we anticipate a positive accreditation decision.

With the return of Dr. Hiroki Yokota in January 2011 after a semester at another university, the BME department now has a full complement of faculty for the first time since the establishment of the department in 2005. This brings the department to ten full-time tenured/tenure-track faculty members, plus one full-time Lecturer overseeing undergraduate curriculum development and assessment, and one Clinical Associate Professor, a researcher in residence recently retired from Medtronic, Inc. who also oversees the senior design class. With the faculty now in place, the department has begun long-range schedule planning for graduate-level and elective coursework, with an eye toward supporting both the depth-area interests of our students and the research interests of the faculty.

Ongoing Outcomes Assessment and Improvement
Following the heavy program-level assessment efforts last year in preparation for our accreditation visit, this year's efforts focused primarily on ongoing course-level assessment and long-range assessment planning. Assessment findings indicate that previous course or program changes are having a positive impact on the outcomes they were meant to address. Two findings are of particular note:

- Beginning in 2008, the math department revamped the engineering math sequence to address concerns that engineering students, despite taking a course called "Linear Algebra and Differential Equations" (MATH 262), were not demonstrating sufficient mastery of linear algebra concepts in their upper-level engineering courses. The revamped math sequence introduces a new freshman-level course, Multidimensional Mathematics (MATH 17100), giving students a stronger grounding in matrix arithmetic and linear algebra. This year's juniors are the first students to have completed this new math sequence. A pretest given to incoming junior students in BME 33400 (Biomedical Computing), a course that draws heavily on linear algebra concepts, indicated that this year's students were significantly more adept with matrix manipulations and linear algebra upon entering the class than were previous years' students, suggesting that the new math sequence is having the desired effect on learning outcomes.
- Assessment of senior design projects and teamwork in the first two years of the program revealed that allowing students to self-select their teams resulted in at least one team per year that lacked the complement of technical, organizational, and leadership skills

necessary to achieve excellence in their design project. To address this concern, senior design teams are now assigned by the director of the undergraduate BME program to ensure that each team possesses members with skills and expertise in all the areas necessary for successful completion of the project. Team progress and final projects are assessed by a panel of faculty from the department. This year's panelists noted marked improvement both in quality of projects and in midterm progress compared to previous years; and in particular, panelists who had also evaluated earlier projects noted that even this year's weakest projects would be in the top 50% compared to projects in previous years. Although many factors may be at play in this improvement, including a greater diversity of available talent due to a larger class size (28 students this year compared to 12-18 in previous years) as well as improvements in achieving foundational learning outcomes in lower-level classes that may be important for capstone success, the careful selection of teams is thought to be making a strong positive impact on teamwork and design success.

In addition, this year the BME department laid the groundwork for future learning outcomes assessment and program improvement:

- As mentioned, the faculty established a long-term schedule of graduate and elective classes. These upper-level and graduate-level classes, from which students will select their sequence of depth-area electives, will help our students develop intellectual depth, breadth, and adaptiveness (PUL 4).
- In anticipation of a favorable accreditation decision (and thus a next re-accreditation visit expected in 2016), the department has drafted a preliminary assessment schedule that will allow two major rounds of outcomes assessment and program improvement over the next six years.
- The BME Graduate Committee, in consultation with the rest of the BME faculty, established a set of graduate learning outcomes to guide assessment of the Master's program. The thesis document and oral defense will continue to serve as the cornerstone of graduate assessment; the establishment of learning outcomes will help guide this assessment process.

Overall, we have made great strides in establishing our department and implementing an effective undergraduate curriculum. We will continue to develop and implement appropriate assessment strategies and to close the loop on assessment, and anticipate that our program's demonstrated success will lead to accreditation this summer.

Program Review and Assessment Committee (PRAC)
2010-2011 Annual Report

Construction Engineering Management Technology (CEMT)
Department of Engineering Technology

June 23, 2011
J. William White

Overview
The CEMT program is continuing to improve its assessment program. Highlights for this past academic year include

- Development and distribution of business continuity / assessment document binders to all CEMT faculty. Every course has been assigned a binder to assist in an emergency when either the regular instructor is unable to teach the course or there is some crisis / disruption which interferes with a course's regular execution.   The content of the binder also includes assessment materials (semester assessments, course reflections, and student work) which will facilitate on-site accreditation reviews.
- CEMT is clarifying its General Education requirement so that it accurately presents the ABET mandated distinction of "global" and "societal". The plan of study (POS) is being revised to accurately depict the requirement and clarify what elective courses are available and which ABET quality they satisfy.
- CEMT faculty met on May 11, 2011 to review the status of every course taught this past semester. Of the 18 courses identified 33% (6 courses) will be modified to improve / update content for Fall 2011. For additional detail refer to Figure 1.
- CEMT reviewed and refined its program objectives. The revisions were submitted to its IAB for review and comment on April 19, 2011. The proposed objectives include:
  - Successfully support, manage or administer construction related operations. [indicators: years of continued employment, staff size, project size, responsibilities, duties, job description]
  - Receive professional recognition / advancement consistent with the awarded degree. [indicators: awards, annual income, titles, staff size]
  - Demonstrate continued interest in professional growth. [indicators: licenses, additional education, professional memberships, industry / professional presentations]
- CEMT continues to evaluate its progress towards improving its assessment capabilities. Refer to the attached Figure 3 for a summary.

Data Collection
Data collection continues to be improved by increasing assessment activities for all faculty. The Assessment Summary Table (Figure 2) was distributed to all faculty to assist in correlating each course's assigned outcomes with their targeted values and actual student performance data.

As previously noted, the business continuation / assessment collection binders have been distributed to all CEMT faculty both full time and adjunct. The binder has a two-fold purpose to 1) record course content which may be used in the event of an emergency and 2) function as a repository for assessment related data, specifically assessment analysis, course reflections and examples of student work.

Additional data collection tools including alumni surveys, IAB consultation, student course evaluations, individual student interviews, etc. continue to play a role in the evaluation of the CEMT program and provide valuable input as to the program's effectiveness.

Analysis

13 CEMT courses, all taught by full-time faculty, were assessed for the Spring 2011 semester. (Figure 4.) All a – k outcomes were addressed in the assessment effort.

46% of the courses reported (6 /13) at least one outcome where student performance failed to satisfy the performance expectation. Where performance was found deficient, proposed corrections have been noted with the understanding that they will be implemented in the upcoming Fall 2011 semester.

In student interviews it was noted that more "hands-on" experience would be a desirable program enhancement. The observation was made that this observation addresses not only the traditional construction field experience but additional ways of applying the in-class material to real world situations.

Closing the Loop

As identified in Figure 4, corrective recommendations have been noted wherever student performance failed to meet the instructor's expectation. These recommendations will be referenced in next year's report to determine if the proposed remedies actually improved the results of the performance indicator.

CEMT faculty meet annually to review the progress of the program by reviewing each course, identifying common trends and assessing the effectiveness of the taught material. Common problems and challenges are recognized so that the program as a whole can benefit from the shared experience.

CEMT will continue to offer opportunities to increase "hands-on" experience through its student organization, the Society of Student Constructors.

Program Review and Assessment Committee (PRAC)
2010-2011 Annual Report

	Course / Instructor	Title	Changes, Proposed Improvements
		CEMT Course Review Summary Spring 2011	
1)	104 Kinsey	Survey Fundamentals	Subsurface utility engineering (SUE) will be considered for course content.
2)	120 Johnson	Construction Materials & Methods	
3)	160	Statics	
4)	260 Kinsey	Strength of Materials	
5)	267 Kinsey	Materials Testing	Asphalt material may be added to the list of reviewed materials.
6)	275 Koo	Civil Engineering Drafting	Reduction in lab enrollment size will be considered to enhance lab time instruction.
7)	280 White	Quantity Take-Off	CD reading component added; use of digital take-off tools increased, use of Excel increased, MS Project offered as a scheduling tool.
8)	302	Construction Law & Ethics	Instructor will be revising content to increase student challenge.
9)	312 Kuhn	Construction & Route Surveying	GIS / GPS technology will be added into the course content.
10)	330 Sener	Field Operations	New textbook has been adopted which adds telematics, trenchless technology and fleet balancing.
11)	341 Iseley	Construction Scheduling & Project Control	New textbook has been adopted, continuing reduction in manual scheduling methodology and increase study of MS Project.
12)	342 Litzinger	Cost & Bidding	
13)	347 White	Construction Administration & Specifications	
14)	350 McCaan	Cost & Control	
15)	390 Iseley	Construction Experience	
16)	430 Sener	Soils & Foundations	Two (2) textbooks have been combined into one (1). Foundation design continues.
17)	447 Rydell	Project Management	Proposed to eliminate textbook from course requirement and rely upon class lectures.
18)	452 Sener	Hydraulics & Drainage	
19)	455 Mehta	Safety & Inspection	
20)	484 Kinsey	Wood & Timber	
21)	494 Kieser	Construction Economics	
22)	499 White	Sustainability in Construction	

Figure 1. CEMT Course Review Summary.

Program Review and Assessment Committee (PRAC)
2010-2011 Annual Report

Construction Engineering Management Technology (CEMT)
Department of Electrical and Computer Engineering Technology

June 2, 2011

ABET A – K Assessment Summary Table		
Course name: _____		Class size: _____
Course number: _____		Semester / Year: _____
Instructor: _____		
Instructor e-mail: _____		

	Column A	Column B	Column C
	Targeted ABET A – K Outcome	Assessment Method / Technique & Minimum Expectation	Results* (include improvement strategy if needed)
1			
2			
3			
Plans for future improvements?			

Figure 2. Assessment Summary Table tool.

	RATING
0	Not in place
1	Beginning stage of development
2	Beginning stage of implementation
3	In place & implemented
4	Implemented & evaluated for effectiveness
5	Implemented, evaluated and 1 cycle of improvement

Stakeholder Involvement	Rating	Program Objectives	Rating	Program Outcomes	Rating	Outcomes + Practices	Rating	Assessment Processes	Rating	Evaluation	Rating
Stakeholders identified	5	Objectives defined	4	Outcomes defined	3	Outcomes mapped to curriculum	4	Assessment ongoing	3	Assessment data re-view	2
Primary stakeholders involved in identifying objectives	5	Objectives publicly documented	4	Number of outcomes are mana-geable	3	Practices systematically evaluated using out-come data	2	Multiple methods used	3	Evaluation done by change agents	3
Primary stakeholders involved in evaluating objectives	5	Number of objectives are mana-geable	3	Outcomes are publicly documented	3	Education practices are modified per assessment data	2	Indirect & direct measures of student learning are used	3	Evaluation of data linked to curricular practices	0
Sustained partnerships w/ stake-holders established	5	Objectives aligned with mission statement	3	Outcomes linked to objectives	1			Assessment processes reviewed for effectiveness	2	Evaluation leads to decisions / action	0
		Objectives periodically assessed	3	Outcomes defined by measurable performance indicators	3			Assessment methods modified based on evaluation	3		

Ranking decreased from previous year.

Ranking increased from previous year.

Figure 3. CEMT assessment program self evaluation table.

Course	Name	Instructor	Submission	Outcomes											Spring 2011 Data			
				a	b	c	d	e	f	g	h	i	j	k	Targeted Criteria	Student Performance	Need for improvement?	Proposed Correction / Remarks
104	Fundamentals of Surveying	Kinsey	Summary Table			●									C: Average class score > 80% on all 13 lab reports	Satisfied	Yes	A sample report will be provided to improve expectations
									●						F: Average class final exam >= 80%	Mean = 82%	-	
110	Construction Accounting	Koo	Report					●		●					Course grade: 80% of students >= B-	# students = 82.13%	-	
260	Strength of Materials	Kinsey	Summary Table	●											A: Average class score > 80% on all 10 quizzes	Mean = 82%	-	
					●										B: Average class final exam grade > 80%	Mean = 83%	-	
									●						F: Average class midterm grade > 80%	Mean = 80%	-	
267	Materials Testing	Kinsey	Summary Table			●									C: Lab report average score > 80%	Satisfied*	Yes	*Lab #1 failed criteria. Example report will be provided to illustrate expected submission.
							●								D: Design project: built-up wood beam	Satisfied	-	
								●							E: Average of group evaluation responses > 80%	Satisfied	-	
275	Civil Engineering Drafting	Koo	Report	●											A: Lab assignment grades >=90%	Mean = 93.56%	-	
									●						F: Homework, quizzes & tests average score >= 80%	Mean = 76,98%	Yes	Emphasis lecture topics for homework and class practices to level of understanding; Utilize team assignments; Review potential quiz; Extend review sessions; Emphasize lecture topics

Course	Name	Instructor	Submission	a	b	c	d	e	f	g	h	i	j	k	Targeted Criteria	Student Performance	Need for improvement?	Proposed Correction / Remarks
																		for homework and class practices to level of understanding
										●					G: Lab assignment grades >=90%	Mean = 93.56%	-	
280	Quantity Take-Off	White	Summary Table			●									C: Overall excavation problem score >= 80%	Overall score = 57%	Yes	Additional in-lecture practice/demonstration will be implemented.
								●							E: Group evaluation: <= 20% cite unequal workload	Overall score = 41%	Yes	Midterm peer evaluations will be administered, increase group interaction instruction.
									●						F: Final exam random calculation problem score >= 80%	Overall score = 87%	-	
330	Field Operations	Sener	Reflection	●				●	●	●				●	Course grade: 65% of students >= B-	11/17 (64.7%)	-	
347	Construction Admin & Specs	White	Summary Table	●											A: Semester project grade average >= 85%	Mean = 83.2%	Yes	Change and clarify instructions, increase lecture time spent on specific assignment. Also update PCM software to SP 5.
											●				H: Lifelong learning response "strongly agree" >= 75%	Mean = 97%	-	
												●			I: Final exam question (pay application) score >= 75%	Mean = 87.9%	-	
350	Project Cost & Control	Koo	Report	●				●		●				●	Course grade: 80% of students >= C	# of students = 100%	-	

Course	Name	Instructor	Submission	Outcomes											Spring 2011 Data			
				a	b	c	d	e	f	g	h	i	j	k	Targeted Criteria	Student Performance	Need for improvement?	Proposed Correction / Remarks
430	Soils & Foundations	Sener	Reflection	●	●				●						Course grade: 65% of students >= B-	24/29 (82%)	-	
452	Hydraulics & Drainage	Sener	Reflection	●	●				●						Course grade: 65% of students >= B-	# of students = 65.2%	-	
484	Wood & Timber	Kinsey	Summary Table	●											A: Average class score > 80% on 12 / 15 problem sets	80% on 13/15	-	
					●										B: Average class final exam grade > 80%	Mean = 85%	-	
									●						F: Average class midterm grade > 80%	Mean = 81%	-	
499	Green Construction	White	Summary Table		●										B: Calculation problems scores >= 80%	Score = 60.9%	Yes	Increase in-class practice with calculation problems, increase exercise work, include calculation problems in test review material.
											●				H: 80% of class will exceed median # of sources referenced.	Count = 63%	Yes	Increase awareness and importance of citing different sources in research work. Spend time in lecture discussing potential sources.
														●	K: Class average score on carbon trading question >= 80%	Score = 82.6%	-	

Figure 4. Assessment Data Summary

DESIGN TECHNOLOGY ASSESSMENT REPORT
Interior Design Technology and Architectural Technology
Prepared by Emily McLaughlin
May 2011

Overview

The underlying objective of the Design Technology (DST) programs is to create multidisciplinary individuals with the necessary skills to enter the technology driven industries of the new millennium. Classroom knowledge links applications to the field through multiple service-learning activities with community partners, and student learning is regularly measured and assessed using PUL and ABET/CIDA outcomes, as well as industry feedback.

During the 2010-2011 academic year, the unit labeled Design Technology demonstrated the commitment to best practices by examining the IUPUI Principles of Undergraduate Learning, ABET criteria and CIDA professional standards, as well as evaluating assessment techniques used to measure learning outcomes related to these principles.

Assessment Initiatives

Over the past year, our programs have participated in a multitude of new and ongoing activities relative to continuous assessment and evaluation of program inputs and outcomes. The following summarizes our most significant efforts, yet is not meant to be all inclusive.

1. Analyzed Gathered Information and Implemented Improvement as Part of the Interim CIDA Accreditation Report

In March of 2011, the Interior Design Technology program was required to submit an interim report to the Council for Interior Design Accreditation (CIDA) to ensure compliance and regular self-study is taking place between accreditation visits. In preparation for this report, faculty participated in several activities.

Strengths and gaps in the curriculum were primarily identified through an exhibition of student work (sponsored by the Student Design Organization) which was viewed and analyzed by faculty, students and local design professionals. It is here that student performance was closely evaluated, and inconsistencies or overlaps in student work are detected and discussed. Specific curriculum changes were proposed and implemented as a result of this intensive exercise, including the introduction of design process earlier in the curriculum, the decision to advance the use of software in the ART courses, and the decision to enhance 3D model making skills in the INTR 225 and INTR 452 course.

The comments of local professionals who have served as jurors for student presentations, reviewed portfolios and participated in mock interview situations with students to further determine the legitimacy of our program and the readiness of our graduates were reviewed by faculty. As a result, our programs revised the product outcomes of student work in all required Computer Graphics Technology courses to be more discipline specific. Students now focus their

graphic efforts on architectural and design modeling using 3D Studio Max software as opposed to Maya software.

Our highly involved advisory board, consisting of both local and national authorities, provided invaluable criticisms through 4 – half day retreats which were held over the past year. It is with their insight and recommendations that the program of study is consistently scrutinized and revised to ensure validity with professional practice and to make certain that program goals remain current. It is at the recommendation of the board that we have hired a part-time community liaison staff individual to assist us with recruitment, retention and identification of community partnerships and collaborations that exist in an effort to take the program as a whole to the next level.

Senior exit interview surveys were analyzed by the faculty and have brought about simple changes based on the recommendations of those who have completed our entire curriculum. Changes to the exit survey's themselves have been completed bi-yearly as the faculty and institution seek new and revised information. As a result of student feedback, the faculty took steps to reevaluate part-time faculty who teach for our programs. Peer reviews of teaching were completed, and reassignments were made. In addition, INTR 453: Business Practices was revamped into a hybrid course for easier delivery.

Identification of strengths and gaps in curriculum has been a regular department meeting topic of discussion. The information gathered has been used to precisely identify key indicators of student outcomes. While there are a multitude of simple changes that have taken place as a result of these meetings, some significant changes include the co-listing of ART 105 and INTR 103, the alteration of prerequisites for some junior and senior courses, and the addition of TCM 250: Career and Internship Planning to our degree programs.

2. Sophomore Advancement Review

Last year, the Interior Design Technology program implemented a sophomore advancement review. All students in the program who intend to pursue a B.S. degree must participate in this exercise, which involves the compilation of an academic portfolio and written statements, and the presentation of this work to a group of faculty who then deliberate without the student present. This exercise has proven to not only offer the student valuable criticisms regarding their academic progress, but also provide the faculty with an assessment mechanism which can be used to ensure that program outcomes are being met at the freshman and sophomore levels specifically. As a result, a rubric was created which allows faculty to cross-reference student outcomes presented at these advancement review sessions with program outcomes for compliance with the PUL's as well as CIDA accreditation standards.

3. Raised Minimum Passing Grade for INTR Courses

Last year, our faculties voted to raise the minimum passing grade for discipline specific coursework from a minimum C- to a minimum C. This measure was taken in an effort to increase the quality of graduating students from our program. Statistics are being kept to examine how this affects graduation and retention rates, and outcomes are still being assessed.

4. New Articulation Agreement

Over the course of the past year, a new articulation agreement with Ivy Tech Columbus was crafted and approved. During this process, it was necessary for all faculties in our area to participate in activities to assess the equivalence of both delivered information and student outcomes between institutions. As a result, our programs were able to relay specific course outcome expectations to our colleagues at Ivy Tech. We believe that this alignment exercise will produce students who are more prepared to articulate to IUPUI, and better prepared to succeed in our programs.

PRAC Report – Academic year 2010-2011
ECET (EET and CpET) programs, Department of Engineering Technology

PULs

Since the campus has begun collecting data on PUL achievement in specified courses, we have discontinued surveying students about their opinions of their own achievement. The PUL data is more desirable than the student opinion surveys for two reasons:

1. The surveys were an indirect measure; the PUL assessment by faculty is more direct
2. It cost the department money to have the data recorded and analyzed

Each instructor is given suggestions and rubrics (if appropriate) to evaluate student attainment of the PULs assigned to that course. The School of Engineering and Technology has requested data for PULs be reported to us on a program level and this data will be used for our accreditation self-study.

Global education

The ECET programs have two sets of criteria to assess: the PULs and ABET. Both require aspects of global education.

> **PUL 5: Understanding Society and Culture**
> Understanding Society and Culture: The ability of students to recognize their own cultural traditions and to understand and appreciate the diversity of the human experience.
>
> Understanding society and culture is demonstrated by the student's ability to:
> 1. compare and contrast the range of diversity and universality in human history, societies, and ways of life;
> 2. analyze and understand the interconnectedness of global and local communities; and
> 3. operate with civility in a complex world.

> **TAC-ABET Criterion**
> j. a knowledge of the impact of engineering technology solutions in a societal and global context;

Within ECET courses, there is little opportunity to learn or assess knowledge of the global communities. To insure students gain this knowledge, EET and CpET students are required to take three general education electives. The faculty have created a list of approved courses and labeled each course on the list as "S" for societal and/or "G" for global. (The list of courses can be found here: http://engr.iupui.edu/ecet/documents/ENTDeptGenEdElectives2009.pdf)

During graduation audits this past year, we discovered that students have fulfilled the societal education requirement, but some students have not fulfilled the global education requirement. To address this, we intend an education campaign to inform students of the requirement and promote the "I" in "RISE". We have also changed SIS plan of study coding to show the requirement; now students will be able to see if they are missing a global education course when they view their advisement report.

Table 1 - ECET PUL Matrix

| COURSE | COURSE TITLE | (3=Major Emphasis, 2=Moderate Emphasis, 1=Some Emphasis) | | | | | | | |
| | | PUL 1A | PUL 1B | PUL 1C | PUL 2 | PUL 3 | PUL 4 | PUL 5 | PUL 6 |
		Written, Oral, Visual Skills	Quantitative Skills	Information Resources Skills	Critical Thinking	Integration/ Application of Knowledge	Intellectual Depth, Breadth, and Adaptiveness	Understanding Society and Culture	Values and Ethics
ECET 10700	INTRO TO CIRCUIT ANALYSIS	2	3						
ECET 10900	DIGITAL FUNDAMENTALS		3						
ECET 11600	ELECTRICAL CIRCUITS		3						
ECET 15500	DIGITAL FUNDAMENTALS II						3		
ECET 15700	ELECTRONICS CIRCUIT ANALYSIS	1	2		3				
ECET 16400	APPL OBJECT-ORIENTED PROGRMNG					3	2		
ECET 20700	AC ELECTRONCS CIRCUIT ANALYSIS		3				2		
ECET 20900	INTRO TO MICROCONTROLLERS					3	2		
ECET 23100	ELECTRICAL POWER & CONTROLS		2			3			
ECET 28400	COMPUTER COMMUNICATIONS	3				2	1		
ECET 30200	INTRO TO CONTROL SYSTEMS					3			
ECET 30700	ANALOG NETWRK SIGNAL PROCESSNG		3	1	2				
ECET 30900	ADV EMBEDDED MICROCONTROLLERS					2	3		
ECET 33100	GEN & TRANSMISSN OF ELEC POWER					2	3		

COURSE	COURSE TITLE	(3=Major Emphasis, 2=Moderate Emphasis, 1=Some Emphasis)							
		PUL 1A	PUL 1B	PUL 1C	PUL 2	PUL 3	PUL 4	PUL 5	PUL 6
		Written, Oral, Visual Skills	Quantitative Skills	Information Resources Skills	Critical Thinking	Integration/ Application of Knowledge	Intellectual Depth, Breadth, and Adaptiveness	Understanding Society and Culture	Values and Ethics
ECET 35100	INSTRUMENTATION APPL FOR TECH		2			3			
ECET 35700	REAL-TIME DIGITL SIGNL PROCESS			1	3				
ECET 37100	AUTO/INSTRUMENTATN/PROC CONTRL					3			
ECET 38100	ELECTRICAL DISTRIBUTN SYSTEMS					3			
ECET 43400	PC SYSTEMS II				2	3			
ECET 48300	NTWRK FUNDMNTLS W MICROCONTRL				1	3	2		
ECET 49000	SR DESIGN PROJECT, PHASE I	1			2	3			
ECET 49100	SR DESIGN PROJECT, PHASE II	1			2	3			
ECET 49300	ETHICS & PROFESSIONALISM-TECH	1						2	3
ECET-I 291	CAREER ENRICHMNT INTERNSHP I					3			
ECET-I 292	CAREER ENRICHMNT INTERNSHP II					3			
ECET-I 393	CAREER ENRICHMNT INTERNSHP III					3			

REPORT FOR 2010-2011 PRAC
UNDERGRADUATE MUSIC PROGRAMS
DEPARTMENT OF MUSIC AND ARTS TECHNOLOGY

BY ROBERTA LINDSEY, PHD

Introduction: This report provides information about the history of the Department of
Music and Arts Technology's (MAT) undergraduate music programs. One area that will
be examined are MAT's efforts to define, measure, and improve attainment of student
learning outcomes for the Bachelor of Science in Music Technology (BSMT), as well as
a general assessment of the non-major music courses. Drs. G. David Peters and Debra
Burns will provide graduate music courses in Music Technology (MSMT) and in Music
Therapy (MSMTh).

Non-Major: The undergraduate music program began circa 1985. By 2000, a minor in
music had been developed in response to the number of undergraduate students interested
in music courses. One of the first steps in 2000 was determining the number of core unit
hours required for the minor encompassing a minimum of 20 unit hours. Students were
required to take eight hours: Introduction to Music Theory, Music for the Listener, and
an Ensemble (Listed in Appendix A) or Z100 Live Musical Performance. The additional
12 hours of electives were divided into distinct areas of emphasis, i.e., Music
Technology/Music Business, Music Studies, Applied Music, Music Theory/Composition
as well as a specific minor for the School of Education majors. (See Appendix B)

 In 2005, the minor was revised demonstrating the increase in the number of music
courses accessible to the undergraduate population at IUPUI, as well as adding a new
area of emphasis in Musical Theatre (21 hours). All students, minor or non-minor, were
strongly encouraged to take one applied music class (private lesson or class lesson on a
particular instrument of their choice). A change in the required courses was also
instituted. Students could now take any Music Theory Class, and Studies in Music
course. All music minor students had to maintain a cumulative 3.0 GPA for their music
classes as well as complete either the 20 or 21 credit hours in order to be awarded a
minor. The designation for the minor is placed on the student's transcript and the student
receives a letter from the Undergraduate Music Coordinator and an unofficial certificate
signed by both the chair of the department and the undergraduate music coordinator.

MAT is currently in the process of revising the minor for Education majors at the request
of the School of Education on IUPUI's campus. Due to the increase in certification
requirements, students in this major have expressed difficulty in squeezing in the
necessary 20 credit hours. The School of Education has requested that MAT reduce the
number of credit hours to 15. (See Appendix C)

Major: 2009 was an important year for MAT's undergraduate music growth. This
represented the first year offering classes for the new Bachelor of Science in Music
Technology (hereinafter referred to as BSMT). MAT accepted its first applications, held
its first auditions and interviews, and gave the first Basic Skills Test. Sixteen students

were accepted into the inaugural fall semester courses of Musicianship I, Private Lessons, and Ensembles for music majors. The curriculum was set by fall 2008 when the BSMT was approved. (See Appendix D) The first classes put into place were then offered in fall 2009 after going through the standard approval processes. All music courses have been approved as of this date.

Retention of BSMT Students: The first class of BSMT students accepted into the program in Fall 2009 numbered 16. By spring 2009, one student had dropped the program, and another was involved in financial aide difficulties. Fall 2010 saw the inaugural class reduced to 12 students. The numbers continue to decline with only eight students from this first cadre moving into their third year in the program. The reduction in numbers was even greater in the second group of students to enter the program in Fall 2010: 15 students were accepted and only seven have made it to their second year in the BSMT. This year, fall 2011, we have accepted 20. This means that we may be offering another section of MUS-A110 Musicianship 1.

Reasons for Falling Retention: There are a variety of reasons provided by both students and faculty for falling retention rates. One is that the students are not adequately prepared for the Musicianship Sequence. This is a difficult sequence of classes that meets five days a week for the first two years. The students learn music theory, keyboard and aural training skills, and music technology in this integrated course from three highly qualified professors. Another reason is that students leave the state, either for family or financial reasons. The third reason that has been provided regards students who have transferred into the program from another school, department or outside university. These students realize that they will have to attend for four more years in order to complete the core music courses. These courses are not offered online, nor are they offered in the summer. It was the intent of the BSMT developers that the students form a tight knit community within their major to enhance future networking opportunities. The chair and coordinator of the undergraduate music programs as well as other faculty directly impacted by the lowering retention numbers are seeking a solution to this problem.

Assessment and PULs: Each instructor realizes assessment in the undergraduate non-major music classes through a variety of assignments and tests. One of the standard assignments required of all undergraduate non-music majors is the concert report. Students must attend at least two live concerts and write a paper about the event. The instructor is responsible for providing detailed criteria on the course syllabus for this assignment. Professors for the music majors utilize either project based assignments in order to assess students' understanding of the material, or performances demonstrating mastery of the student's primary instrument.

All undergraduate major and non-major music courses incorporate at least three of the six Principles of Undergraduate Learning (PULs). The undergraduate music coordinator and the chair of MAT determined which PUL matched the class description and signified major emphasis, moderate emphasis, and some emphasis. Two years ago, instructors were required to provide a PUL Evaluation of each student during the final grading

period. Since MAT relies a great deal on adjunct/part-time faculty and lecturers to teach our undergraduate classes, it was necessary to create a process that would insure that all faculty members were comfortable with completing this evaluation. The instructor associated the students grade to a particular code: V for very effective, S for somewhat effective, E for effective and N for not effective.   In other words, if a student receives an A (of any kind), their PUL Evaluation score is a V for very effective; If the students obtains a B (of any kind), their PUL Evaluation is an E; if the student is given a C (of any kind), their PUL score is S; and if the student receives anything else (D, F, FN, FNN, I…), then they will have an N for their PUL Evaluation. (See Figure 1 below)

Student Grade	=	PUL Evaluation
A	=	V
B	=	E
C	=	S
D, F, FN, FNN, I, etc.	=	N

Learning Outcomes: The chair and coordinator of undergraduate music studies created and defined learning outcomes for all BSMT students during the academic year 2010-2011 in accordance with music's accrediting body, National Association of Schools of Music (NASM) and IUPUI's PULs. MAT's goals for each BSMT student upon completion consist of:

1. Analyze, evaluate, and work conceptually with the elements of music—such as rhythm, melody, harmony, structure, timbre and texture;
2. Demonstrate an understanding of and the ability to read various forms of musical notation;
3. Identify and propose solutions for various compositional process, aesthetic properties of style, and the ways these shape and are shaped by artistic and cultural forces;
4. Demonstrate a basic mastery of their principal musical instrument;
5. Communicate effectively in a variety of settings using various forms of technology;
6. Exhibit a basic overview and working knowledge of technology and how it serves the field of music as a whole;
7. Form and defend judgments about music;
8. Explore multidisciplinary issues related to music in general, and to areas of the major; and
9. Continue to develop skills necessary for the development and advancement of their careers.

In order to measure each of these learning outcomes, MAT faculty involved in the BSMT have created an ePortfolio site. Each of the music courses required by BSMT students is represented in the large matrix, and each class, i.e., Musicianship I (MUS-A110), has an individual matrix allowing the students to up-load projects and the professors to provide

comments. Additionally, the type of data obtained from these matrices will assist in measuring specific NASM guidelines for the degree, as well as afford a more detailed evaluation of the PULs.

Data collection system: In addition to utilizing the ePortfolio, information gathered from assignments is designed to measure specific NASM guidelines and PULs in both non-major and major courses. The types of data represented by MAT's classes are: assignments, applied music lessons, ensemble participation, and observations from primary instrument instructors.

Actions taken in response to findings: Following an extensive review of the Learning Outcomes, Assessment Measures, and Assessment findings, the chair and coordinator of undergraduate music programs plan to insure that the Learning Outcomes incorporate PUL/NASM criterion in disciplinary outcomes, and to include an assessment of support services in the Learning Outcomes. It is also our finding that our Assessment Measures need to demonstrate how direct measurements of outcomes are supported by indirect actions.

Improvements: In the short time MAT has existed, it has demonstrated a responsive attitude toward the students at IUPUI through increased course development. One improvement that is required is to generate a closer alignment of PUL and NASM criterion. This action will insure that all music students are able to apply MAT's specific learning outcomes. Another action is to tighten audition standards in order to secure a higher student retention rate, as well as institute a musicianship placement test for incoming students.

Appendix A: Ensembles

Chamber Music Ensemble
Guitar Ensemble
Laptop Orchestra
Afro-Cuban Percussion Ensemble
University Instrumental Ensembles:
      Indianapolis Philharmonic
      Scottish Rite Orchestra
      Pep Band
      Jazz Band
      Jazz Combo/Chamber
University Vocal Ensemble: University Choir
Telematic Performing Ensemble

Appendix B: Music Minor

Applied Music+	Studies in Music	Music Tech/ Music Business	Music Theory/ Composition	Musical Theatre
Trumpet/Cornet Elective Secondary*	Intro to Music Therapy	Music & Computers+	Sight Singing/ Ear Training 1	Musical Theatre Workshop
Horn Elective Secondary	Psychology of Music+	Digital Sound Design/Multimedia 1	Sight Singing/ Ear Training 2	Sight Singing/Ear Training 1
Percussion Elective Secondary	Music and Exceptionality+	Digital Sound Design/Multimedia 2	Intro to Music Theory+	Sight Singing/Ear Training 2
Guitar/Bass Guitar Elective Secondary+	Music for the Listener+	Editing Using Pro Tools	Music Theory 2	Voice Elective Secondary or Voice Class
Beginning Guitar Class+	Black Music in America+	Foundations of Music Production	Music Theory 3	The American Musical
Intermediate Guitar Class+	History of Rock 'n' Roll 50-60s+	Introduction to Music Business	Music Theory 4	Beginning Piano Class
Piano Elective Secondary+	History of Rock 'n' Roll 70-80s+	Max/MSP/Jitter	Compositing with Finale	Song Interpretation & Performance **or** Musical Theatre Auditions
Piano Class 1+	Music for Film	Music Business Marketing	Computer Music Composition 1	Intro to Music Theory
Piano Class 2+	Global Music Journeys+	Music Technology Methods	Computer Music Composition 2	The American Musical **or** Contemporary Broadway Musicals
Violin Elective Secondary	History of American Popular Music+	Principles of Multimedia Technology	Introduction to Film Scoring	Acting for the Musical Theatre
Voice Elective Secondary	Indy JazzFest: The Experience	Social Media and the Musician+		
Voice Class+	Music in Contemporary Film	Website Design for Musicians+		
Flute/Piccolo Elective Secondary	Music of Jimi Hendrix			
Saxophone/Clarinet Elective Secondary	Women Musicians+			
Steel Pan Techniques	History of Jazz before 1950			
Jazz Improv 1	Music of the Beatles			
Jazz Improv 2	Music of Pink Floyd			
Violin/Viola Elective Secondary	Music of Michael Jackson			
	Music of Elvis Presley			
	Hip Hop Music & Culture			

+ Also used for Education Majors as well as Introduction to Music Fundamentals course.
*Elective Secondary is the same as private lessons.

Appendix C: Music Minor for Education Majors
Under Discussion and Review

Total number of requisite credit hours: 15

This is comprised of 9 credit hours of required classes and 6 credit hours of electives.

Required courses include:

E241	Introduction to Music Fundamentals	3 hours
M324	Teaching about the Arts	3 hours
An Applied Music Class* with Lab		3 hours

Possible Electives:

L418	Psychology of Music	3 hours
M110	Music & Computers	3 hours
M174	Music for the Listener	3 hours
U355	Music & Exceptionality (Special Ed)	3 hours
Z201	History of Rock 'n' Roll Music 50-60s	3 hours
Z320	History of Popular Music in America	3 hours
Z320	Global Music Journeys	3 hours
Z385	History of the Blues	3 hours
Z393	History of Jazz	3 hours
Z394	Black Music in America	3 hours

*Applied Music Courses

P110	Piano Class 1	2 hours
P120	Piano Class 2	2 hours
L101	Beginning Guitar Class	2 hours
V101	Voice Class	2 hours

Although no audition is required, students must declare their intention to receive a minor in music the semester before their graduation.

Revised June 2011

Curriculum and Requirements

General Education Courses	36 hrs
Computer Technology Concentration Courses	24 hrs
Music Courses	55 hrs
Electives (300 and 400 level)	15 hrs

General Education	**36 hrs**	**Music Courses**	**55 hrs**
Written and Oral Expression	9 hrs	Musicianship I, II, III, and IV	24 hrs
Humanities	6 hrs	Music Ensemble (four years)	8 hrs
Physical/Life Science/Mathematics	9 hrs	Applied Music (four years)	8 hrs
Social Science	6 hrs	Music Technology I, II, and III	12 hrs
Electives	6 hrs	Capstone Music Performance	3 hrs

Outside Concentration	**24 hrs**	**Music and Minor Electives (300/400 Level)**	**15 hrs**

This is a secondary field of study.

Courses are selected from informatics, liberal arts, engineering, computer technology, communications, or education.

The concentration has a second capstone requirement.

DEPARTMENT OF MECHANICAL ENGINEERING
2010 - 2011 ASSESSMENT REPORT NARRATIVE
Written June 2011

The Department of Mechanical Engineering (ME) is comprised of 10 full time faculty and one full time advisor who support BS through PhD programs. Since Fall 2000, we have assessed our programs for continuous improvement, guided by ABET, Inc. standards and the internal assessment processes of the IUPUI School of Engineering and Technology and the campus at large. We are accredited by ABET, Inc. The comprehensive 2010 ABET Self-Study may be referenced on our department's website (www.engr.iupui.edu/me/fassessment.shtml) and contains information about our constituents, assessment processes, findings, and associated changes over the last six years as well as details of the ME course outcomes and their relationships with the IUPUI Principles of Undergraduate Learning (PUL).

Recent Improvements

In September 2010, the Mechanical Engineering Program was favorably assessed by ABET, Inc. The ABET assessment team also pointed out areas for improvement, which included revision of the Undergraduate Program Educational Objectives to be broader statements and more resources needed for the faster growing program. In response to the ABET review, new objectives (www.engr.iupui.edu/me/funderobjectives) were developed; more resources have been allocated to the department in the new academic year.

Our department continues to assess our courses for learning and student satisfaction. We have done another set of direct program outcome assessment and continued jury evaluations on key courses and programs such as intern/co-op. The department has participated in the school's effort to develop graduate program outcomes. For graduate program assessment, the department has been doing course outcome assessment and evaluation of thesis and project presentations.

Actions have been taken for program improvements. A resulting development was the new undergraduate concentration in Mechatronics, implemented in Fall 2010. Students may complete the three-course concentration by taking specific courses to fill their technical electives. Concentrations in energy, motorsports, and nanotechnology are currently under development.

Another significant development is the department's new B.S. program in Energy Engineering (EEN), which accepted its first freshman class in Fall 2010. Three EEN core courses as well as several elective courses will be offered in the 2011 academic year. Details of the program may be found at http://www.engr.iupui.edu/energy.

Improvements also continue in the academic advising processes and related student satisfaction. The SIS Student Center now contains a fully functional Academic Planner tool allowing students to design a semester-by-semester plan through graduation. In light of this new technology, in Fall 2010 the paper plan of study traditionally assigned as part of ME 37200 was replaced with an assignment requiring students to complete their Academic Planner and import it into their Academic Advisement Report (AAR) to make a plan for graduation. Students were also

required to complete an Undergraduate Application for Graduation based on the graduation plan, followed by an appointment with their advisor to verify the assignment completion.

The student feedback was very positive. The only suggestion for improvement was to teach the information sooner so students would have more control over planning their academic careers. In response, in Spring 2011 the Department moved the instruction on how to use the planner and the AAR from ME 37200 to ME 26200, a second-semester Sophomore course. The graduation plan assignment remains in 37200. The undergraduate advisor used the time with the ME 26200 sophomores to relay other key advising information that would be helpful to students as they continue with their academic careers. The students responded very favorably and 100% of those who completed the follow-up survey indicated their appreciation for academic advising increased as a result of the visit, with all of them stating they would definitely seek advising sometime within the coming academic year.