Electrical and Computer Engineering Session

AGENDA

October 5, 2007

Introduction of Faculty.....Kwang Lee
Overview of the Department.....Kwang Lee
ABET Report.....Jim Farison
Missions Project.....Brian Thomas
Internship Program.....Randall Jean
Graduate Program.....Mike Thompson
Strategic Planning.....Steve Eisenbarth

Introduction of Faculty

- Kwang Lee, Chairman
  - Russ Duren
  - Steve Eisenbarth
  - Jim Farison
  - Don Farris
  - Ian Gravagne
  - Randall Jean
  - Bob Marks
  - Brian Thomas
  - Mike Thompson

Overview of the Department

Kwang Lee

- Recruitment
  - Students at Fall Premiere
  - Faculty
- Course pre-fixes and re-numbering
- New Departmental Website

Report on BS-ECE Program ABET Accreditation Cycle

2006	
July 1	Submission of self-study report
October 8-10	ABET team campus visit
October 10	Exit interview
	Seven-day response
	Draft report
	Due process (30 day) review
	Due process response
2007	
July 20-21	ABET EAC final action
	Final statement

Report on BS-ECE Program ABET Accreditation Cycle

Accreditation "Shortcomings" Terminology

Weakness	Lacks strength of compliance (2V/2R)
Concern	Criterion satisfied, but future (?)

Report on BS-ECE Program ABET Accreditation Cycle

Our results

	None
Weaknesses	None
Concerns	
Ageing faculty	retirement replacements?
Limited space	new space for growing activity?
Student equipment	not equivalent to industry?

Assessment Overview

- Objectives
- Outcomes
- Process
- Measures

ECE Objectives

The objectives of the B.S. in Electrical and Computer Engineering program, delivered in an educational environment shaped by Christian ideals, are that:

1. graduates have the technical maturity necessary to be productive and successful engineers.
2. graduates have the professional skills necessary for interacting effectively with society.
3. graduates have the capacity for the thoughtful integration of work and life and to view the engineering profession as a lifelong commitment to serve others.

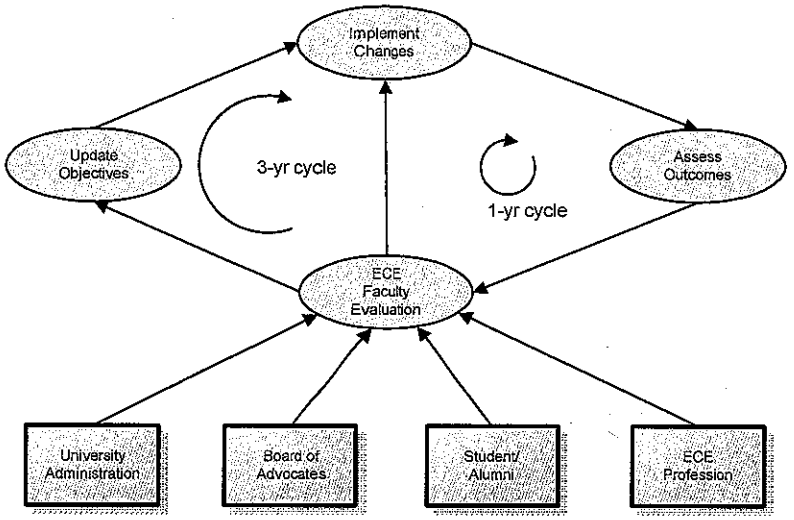
ECE Outcomes (a-k)

a) an ability to apply knowledge of mathematics, science, and engineering
b) an ability to design and conduct experiments, as well as to analyze and interpret data
c) an ability to design a system, component, or process to meet desired needs
d) an ability to function on multi-disciplinary teams
e) an ability to identify, formulate, and solve engineering problems

ECE Outcomes (a-k)

f) an understanding of professional and ethical responsibility
g) an ability to communicate effectively
h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
i) a recognition of the need for, and an ability to engage in life-long learning
j) a knowledge of contemporary issues
k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Assessment Process



Assessment Measures

- ABET Assessment Forms for Courses
- FE Exam Scores
- Exit Survey for Graduating Seniors
- Grades in Selected Courses (secondary)
- Employer Feedback – Not yet a formal part of the process. We would like to find a way to make this happen.

FE Results from the AM Session

AM Subject	# Exam Questions	Institution AVG % Correct	National AVG % Correct
Mathematics	19	78	74
Engineering Probability and Statistics	8	77	65
Chemistry	11	79	67
Computers	8	92	82
Ethics and Business Practices	8	81	75
Engineering Economics	10	72	51
Engineering Mechanics (Statics and Dynamics)	13	64	59
Strength of Materials	8	46	43
Material Properties	8	79	61
Fluid Mechanics	8	65	45
Electricity and Magnetism	11	85	81
Thermodynamics	8	54	51

Outcome a) an ability to apply knowledge of mathematics, science, and engineering

Outcome f) an understanding of professional and ethical responsibility

FE Results from the PM Session

PM Subject	# Exam Questions	Institution AVG % Correct	National AVG % Correct	National Standard Deviation **
Circuits	10	47	56	1.9
Power	8	46	52	1.5
Electromagnetics	4	67	56	1.0
Control Systems	6	92	62	1.4
Communications	5	53	39	1.1
Signal Processing	5	60	39	1.2
Electronics	9	72	61	1.9
Digital Systems	7	71	55	1.8
Computer Systems	6	81	60	1.4

Outcome e) an ability to identify, formulate, and solve engineering problems

NCEES Confidentiality Statement

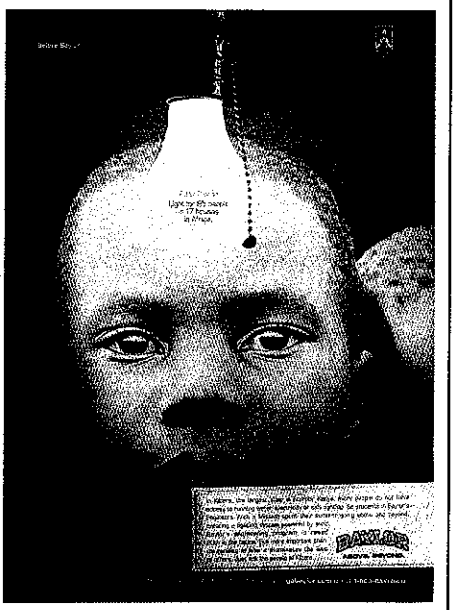
This report contains confidential and proprietary NCEES data. The report itself may not be provided to third parties or used for any purpose other than that contemplated by NCEES and the recipient of this report. The information contained in this report however may be shared with accrediting bodies so long as the report recipient expressly informs the accrediting body that the information is confidential and proprietary and may not be used for any purpose unrelated to the accreditation review of the institution or program in question. By using any of the information contained in this report the report recipient agrees to respect and be bound by these terms conditions and limitations regarding the use of NCEES data. Your cooperation is appreciated.

Engineering Mission Work

- Projects from last year
  - Small hydropower system in rural Honduras
  - Foam house construction in Armenia

Engineering Mission Work

- Other news
  - National Geographic and Texas Monthly ad spotlighting Engineering School and Engineers with a Mission
  - Engineering trips are becoming a significant recruiting device



Engineering Mission Work

- *Possible* projects for next year
  - Ugandan solar power system for future orphanage
  - Three hundred foot pedestrian bridge in Kenya
  - Next steps for foam houses in Armenia

Engineering Mission Work

- Needs
  - Frequent flier miles can be donated
    - KLM, British Airways
  - Scholarships to offset student travel costs
  - Connections with potential donors sympathetic to cause (see Rob Kennedy)

ECE Internship Program

ECE Interns for 2007

- Jacob Cox (Fallas Automation)
- Brandon Herrera (ECE Microwave Lab)
- Kyle Kennedy (AT&T)
- Hunter Smith (National Instruments)

Our Goal as We Grow

- Communicate the value of real-world experiences to our students.
- Do a better job of connecting our students with prospective employers.

Our Challenges

- An internal concern dealing with the high cost to students for internship course credit.
- Networking with employers to showcase the value of Baylor Engineers.

Graduate Program Overview

- Degree Programs
- Stipends and Tuition Remission
- Current Numbers
- Graduates

Degree Programs

- Master of Science
  - Electrical and Computer Engineering
  - Biomedical Engineering
  - Mechanical Engineering
  - All require 30 hrs + thesis
- Master of Engineering
  - 33 hrs. + project

Joint Degree Programs

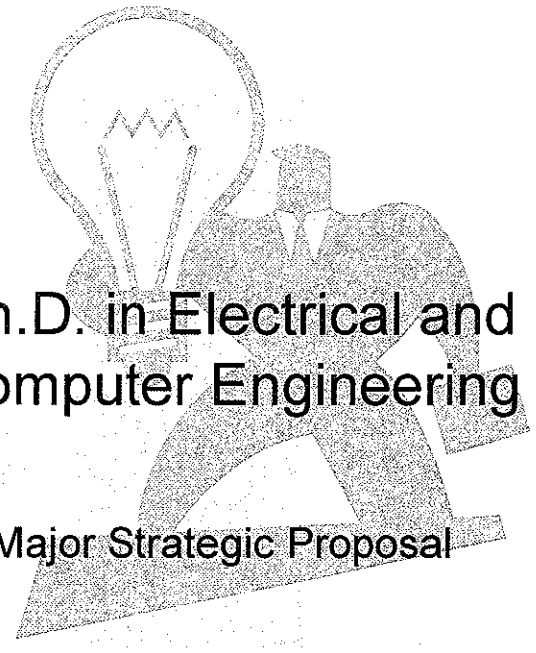
- Master of Science
  - Share 6 credit hrs. between undergrad technical electives and graduate program
- Master of Engineering/MBA
  - Share 15 hrs. of common credit
  - Complete in about 2 years + 1 semester

Stipend and Tuition

- Grad School Funding for 8 stipend positions.
- Grad School Funding for 10 full-time equivalent students.
- Stipend $1500/mo for 10 months.
- RA positions from Research, Start-up and Distinguished Professor Funds

Head Count

- Recruiting: 51 qualified applicants
  GRE – 750 Quantitative, 500 Verbal
- 16 Full-time Graduate Students (9 ECE Advisors)
- 4 Part-time Graduating (All ECE)
- 2 Industry Part-time Students (1 ECE)
- 15 Graduates (10 MS –ECE, 3 M.E)



Ph.D. in Electrical and Computer Engineering

Major Strategic Proposal

Baylor's Vision 2012 Goals

Strong Graduate Programs:

"No university has yet gained such rank without strong graduate programs."

Clear Christian Identity:

"Baylor will make its influence felt in the academic world and in our larger society as an institution informed and motivated by its Christian identity."

Significant Scholarly Output:

"Such influence requires a depth of scholarly excellence and a volume of scholarly output that is found only in schools with first-rate graduate programs."

Rigorous Christian Perspective:

"For our influence to be distinctly Christian, a core of this scholarly work must be done from a rigorously Christian perspective."

Table 2. Private Universities with Doctoral Programs in Engineering by U.S. News Ranking

University	U.S. News Ranking [1]	ECE Faculty Count [3]	EGR Teaching Faculty Count [2]	Engineering Doctoral Degrees Offered [3]	U.G. Enrollment [2]	Graduate Enrollment [2]	Research Funding [2]
Princeton	1	29	122	EE, CS, ME, O(2)	4,760	2,010	$52.1 M
Yale	3	21	57	EE, CS, ME, O(3)	5,333	2,580	$13.1 M
Duke	8	36	94	ECE, BME, ME, CS, O(1)	6,179	2,599	$55.4 M
Dartmouth	11	NR	28	EE, ME, Bio	4,110	1,374	$17.1 M
Brown	14	27	57	ECE, BME, CS	5,701	1,568	NR
Johns Hopkins	14	19	135	ECE, BME, ME, O(7)	5,827	10,868	$54.3 M
Northwestern U	14	54	161	EE, BME, CS, ME, O(7)	8,454	7,749	NR
Vanderbilt	19	33	82	EE, BME, CS, ME, O(3)	6,378	2,122	$43.4 M
Notre Dame	19	25	93	EE, CSE, O(3)	8,427	1,898	$18.6 M
Lehigh	31	21	119	EE, CS, ME, O(7)	4,743	2,116	$31.5 M
Case Western	41	22	116	EE, CpE, BME, ME, O(10)	4,305	3,941	$37.1 M
Syracuse U	50	32	65	ECE, ME, CISE, O(3)	12,387	3,795	$16.1 M
Boston University	57	47	130	EE, CpE, BME, ME, CS, O(3)	16,231	7,456	$59.6 M
SMU	67	19	49	EE, CpE, ME, CS	6,296	3,402	$2.7 M
Baylor	**75**	**10**	**33**	**none**	**11,831**	**1,278**	**$698,626**
Marquette U	82	14	55	ECE, BME, CS, ME, O(1)	8,048	2,488	$1.7 M
Northeastern U	96	43	90	ECE, CS, ME, O(6)	18,056	4,780	$20.1 M
U of Dayton	112	15	50	EE, ME, O(3)	7,473	3,030	$66.6 M

Notes: [1] USNews.com: America's Best Colleges 2008. [2] *Data Profiles of Engineering and Engineering Technology Colleges, 2006 Edition*, ASEE. [3] Data obtained from EE or ECE department web pages.

ECE Faculty Profile

Table 1. ECE Faculty Publication and Funding Record (Since Jan 2002)

ECE Graduate Faculty Member	Ph.D. Granting Institution	Refereed Journal Publications since 2002	Refereed Conference Papers since 2002	Non-Baylor Research Funding since 2002 [3][4]	Baylor Research Funding since 2002 [4]	Other Funding since 2002 [5]	Pending Proposals
R. Duren	SMU	3	8[2]	$61,766[1]	$425,118	0	-
S. Eisenbarth	Baylor	1	9	0	0	$696,470	$1,000,005
I. Gravagne	Clemson	6[2]	7[2]	0	$154,651	$325,861	$185,974
R. Jean	TAMU	3	0	0	0	$30,000	$653,343
K. Lee	Michigan St	27[2]	80[2]	$352,067	$187,254	$295,000[1]	-
R. Marks	Texas Tech	18[2]	41[2]	$1,759,820	$181,136	$117,237[1]	-
M. Thompson	TAMU	2	2	0	$70,000	0	-
Totals		60	147	$2,173,653	$1,018,159	$1,464,568	$1,839322

Note [1] Includes funding received prior to Baylor employment. [2] Includes publications authored prior to Baylor employment. [3] Funding apportioned by number of investigators. [4] Research Funding includes NSF, NIH, NASA, DOD and JPL sources. [5] Other funding includes NSF non-research, State of Texas, and private/government contracts.

Important MSP Elements

- *How does the plan support and conform to Baylor's mission – to educate men and women for worldwide leadership and service by integrating academic excellence and Christian commitment with a caring community?*
- *How does the plan help us reach the goal of Vision 2012 – to enter the top tier of American universities while deepening our distinctive Christian mission?*
- *What are the external opportunities and threats that relate to the proposed project?*
- *Describe plans to pursue external funds resulting from consultation with a development officer. To what extent are endowment funds a possibility?*