Baylor University
School of Engineering and Computer Science
Board of Advocates
Fall Meeting - October 4, 2002
Baylor University; Waco, Texas

Board members attending: Doug Aldridge, Bob Finner, Doug Holberg, Ed Maggio, Bill Mearse, Shawn Sedate, Brian Sheets, Steve Smith, Harold Spangler, Gary Stripling, Dean Swisher, and Mike Yates.

Board members absent: Rob Auld, Ianne McCrea, Jeff Moody, Maury Rester, Darin Rice, Doug Verret, and Trent Voigt

Others attending: Dean Ben Kelley, Cindy Dougherty, Jim Farison, Don Gaitros, Leigh Ann Marshall, and Cheryl Tucker

Welcome

Following a continental breakfast, Bill Mearse convened the meeting. Following Mr. Mearse's welcome and introduction of President Robert Sloan, Dr. Sloan addressed the Board. He began by thanking the Board members for their support of the School of Engineering and Computer Science. He said "it helps Baylor for you to be on campus. It helps student and faculty to be up-to-date on trends" in industry. Dr. Sloan commented that the School of Engineering and Computer Science is a professional school, so students as freshmen begin their first days with "remarkable focus and expertise." Baylor's School of Engineering and Computer Science attracts Baylor's most academically-qualified students, and that is necessary because of the rigor of the programs.

Dr. Sloan continued his address by reflecting on the ten-year vision, "Baylor 2012." He gave a brief history of the vision. He indicated that it is more than a "glorified fundraising campaign." While it does have an endowment component, it is, first, a philosophical statement with implications for core convictions. Dr. Sloan discussed Baylor's history and heritage, and said, "Today, less than half of our students and faculty are Baptists." Baylor's founders had a sense of who they were and knew they were "flexible and adaptable." Before listing the twelve imperatives outlined in "Baylor2012," he stated, "The central premise is you don't have to discard Christian faith to be successful. Christian devotion leads to excellence. We are driven to be excellent because of our historical foundation." The twelve imperatives, according to President Sloan, are:
1. That the student-faculty ratio be 12.7:1.

2. That the campus be an increasingly residential campus.
3. That the faculty be "great."
4. That the students be "top tier."
5. That new academic programs be initiated, such as the Honors College, now in implementation.
6. That students understand "life as stewardship and work as a vocation."
7. That Baylor provide "outstanding academic facilities.
8. That there be "useful and aesthetically pleasing physical spaces."
9. That there be outreach to the entire Baylor family.
10. That Baylor "build with integrity a winning athletic tradition in all sports" (including football).
11. That "global education" be emphasized.
12. That a $2 billion endowment be achieved.

Dr. Sloan indicated that a "renovated money management philosophy" resulted in our financial returns being higher this year than in past years. He concluded by saying Baylor will accomplish the imperatives.

Dean's Report

Dean Kelley reported on the School of Engineering and Computer Science by highlighting recruitment factors, faculty positions, and upcoming events. His presentation is attached to these meeting notes.

A Retreat Report

Dr. Paul Grabow, Associate Professor of Computer Science, addressed the Board regarding a retreat involving the School of Engineering and Computer Science (ECS) faculty. The faculty retreat, entitled "Vocation and the Professions of Engineering and Computer Science," met May 20-23, 2002, at Laity Lodge, near Kerrville, Texas. The purpose of the retreat was to explore the concept of Christian vocation and to examine its application to the contemporary education of engineers and computer scientists. Twenty ECS faculty, along with ten faculty from other faith-based universities in the United States, attended. Guest speakers included Dr. Lee Hardy, Chair of the Department of Philosophy, Calvin College, and Dr. Bob Slocum a laser physicist and President of Polatomic, Inc., in Richardson, Texas. The faculty concluded the retreat with several "truths:"

- Vocation is more than "occupation."
- Vocation is properly understood as a call, and it "embraces all of life."
- Vocation is a "gift from God."

Since the retreat, there has been follow-up in the form of essays, which each faculty member wrote in response to some aspect of the retreat, and some of these will be published. Also, a report on the retreat was submitted to Baylor's Institute for Faith and Learning (one of the retreat sponsors).

Breakout session: Computer Science

Board Members: Bill Mearse, Ed Maggio, Douglas Aldrich, Dean Swisher, Shawn Sedate and Harold Spangler

Faculty: All Computer Science Faculty were present

Dean Swisher agreed to make the afternoon presentation representing our breakout session.
Introduction by Dr. Gaitros:
- Ph.D. proposal is progressing
- IBM grant for 5 yrs., $650,000 ACM programming contest to expand to high school areas. This is under Dr. Poucher and Dr. Donahoo. The lab is set up in our dept. We are 1 of 40 in the world to get SURG grant. Local programs being headed up by Dr. Donahoo. Dr. Sturgill works with local chapter and our programming team.
- Dr. Speegle has the $350,000 Texas Infrastructure Grant with Dr. Donahoo. Has received $75,000 worth of equipment. Research ideas now.
- Remainder of time spent with the faculty presenting themselves to the Board members in a "get to know the faculty better" panel.

Each faculty member introduced himself/herself, gave educational background, courses presently teaching or taught in past, research interests.

The Board expressed excitement over our varied program and areas of research and interest and were particularly pleased with the new faculty hired this fall and their contribution they will be bringing to the program.

Dr. Gaitros expressed to the Board the tension between the Engineering Dept. and Computer Science. He wanted input from the Board on ideas they may have from their business experience in dealing with this type of situation. The Board was appreciative of the honesty and openness with which the CSI faculty discussed the situation and expressed the importance of the need for the students to see collaboration between the 2 dept. faculties and to focus on a way to work together for a common need.

Breakout session: Engineering

Board Members present	Faculty present
Steve Smith, Trinity	Steve Eisenbarth, 1st session
Craig Nickel, Marco	Brian Garner, both sessions
Brian Sheets	Ian Gravagne, both sessions
Doug Holberg, Cygnal	Ken Van Treuren, 1st session
Bob Finner, Trane	James Farison, both sessions
Gary Stripling, L3	Walter Bradley, 2nd session
Mike Yates, Conoco Phillips	Robert Doty, 2nd session

Cindy Dougherty
Linda Kerr

Ken Van Treuren gave a presentation on the mechanical stem of the Dept. of Engineering:
- Activities and projects have been integrated into the lecture courses so that when the students get to ME lab, they have had experience in writing and giving reports
- Gave an overview of
    - Dr. Doty and the courses he teaches
    - Dr. Sun and the courses she teaches
    - Himself and the courses he teaches
    - 2345 Thermodynamics
    - 3321 Fluid Mechanics
    - 3345 Advanced Thermodynamics: requires 2 projects
    - 4345 Heat Transfer: senior course, requires 3 projects

- 4335 Mechanical Engineering Lab: capstone of the mechanical stem with a major project including formal presentation and report
- Electives
    - 4347 Analysis and Design of Propulsion Systems
    - 4336 Energy Systems
    - 4V96 Numerical Methods

Gary Stripling commented that all of this is applicable to "real world" of industry and he is interested in possibilities of incorporating local people and companies. Also mentioned that they have an internally taught course that he would be willing to share with us.

James Farison mentioned that by student get to ME lab, they have already completed 13 courses.

Ken Van Treuren commented that he sees it as our job to excite the student and stimulate them for when they get into the "real world".
Bob Finner sees the opportunity to work together.

James Farison asked if there is anything missing in the mechanical stem.

Bob Finner stated that in his company, they are told to build the controls first and worry about the box later.

Brian Sheets commended the project work.

Ken Van Treuren stated that the projects and papers better prepare the students to be able to walk into a job after graduation.

Gary Stripling wondered if the students struggled with the courses, and wondered if we suffered attrition because of it.

Ken Van Treuren answered no.

Steve Eisenbarth gave a presentation of the electrical and computer stem of the Dept. of Engineering:
- Gave an overview of all the courses and the professors who teach them.
- Talked about IEEE and ACM integrating
- Talked about the area of computer engineering as it will be defined by ABET
- Talked about the core topics and electives
- Looked at new curricular issues
- Gave an overview of 4438 Computer Systems Design, the capstone course of the electrical and computer stem
- Stated our needs – more faculty in the electrical, computer, and biomedical areas

Gary Stripling asked how can they (the board) help?

Steve Eisenbarth stated that we need industrial case examples to give to the students, as well as guest lecturers from industry.

Gary Stripling stated that industry suffers from a lack of systems specifications and design and is glad to see that we're teaching that.

Brian Sheets sees a need in the real world for systems design.

Steve Eisenbarth said that tools are needed to track design

Doug Holberg noted that ACM (ABET?) requires 2337 and wondered how we are teaching it.

Steven Eisenbarth explained the methods used to teach it: VHDL, Xilinx, simulation

Doug Holberg wanted to know if the students learn to write VHDL.

Steve Eisenbarth replied yes.

James Farison then spoke about our engineering situation as a whole
- Enrollment trend – gradual growth
- Faculty – 2 levels (A and B)
- Separate degrees we're seeking (to be considered at the October Regents' meeting)
- Establishing honor societies
- Working toward a biomedical engineering program/degree

BREAK

James Farison began the second session by giving a brief overview of the general criteria expected from ABET for accreditation next time (as detailed in the board members' packets), then asked board members for comments on what they expect an engineering graduate to be able to do.

Gary Stripling asked were our objectives measurable, and commented that his company looks for a positive attitude in prospective hew hires.

Steve Smith said that his company looks for someone who displays initiative.

Gary Stripling also stated that the new engineers need to be able to work with people and need to have a working knowledge of the tools used by his company.

Doug Holberg stated that they need to have a firm basis in the fundamentals as well good problem solving skills

Mike Yates said the new engineer needs to know the basic core curriculum and needs to know not only *what* he is doing, but *why* he is doing it. He also stated that coop programs are very helpful to achieve this.

Gary Stripling noted that our customer is no longer the student only, but industry as well.

Mike Yates, Gary Stripling, Brian Sheets held a brief discussion about the need for the student not to try to finish in 4 years, but to get in some summer interning and coop experience as well as other well-rounding courses.

Craig Nickel stated that his company looks for confidence and leadership material in new hires.

James Farison introduced Walter Bradley and his plans for beginning getting a master's program off the ground.

Walter Bradley spoke briefly about those plans.

In conclusion, James Farison
- Mentioned that we are in the process of managing a lot of change, within Baylor as well as our own department.
- Briefly mentioned the Robert Foster Cherry Award and asked the board for nominees if they know of any outstanding engineering professors.
- Stated that we would pay for any board member wishing to receive the ASEE magazine.
- Introduced Robert Doty who
  - Gave a brief overview of 4390 Senior Design
  - And introduced Ian Gravagne who
    - Briefly explained this semester's project
  - Stated that we are open to ideas and funding for future projects
- Briefly mentioned the Horizon's Grant and asked for possible future speakers for it.
- Asked board members to tell him at the end of the day how effective the meetings were for *them* to be valuable to us.

Lunch

The Board reconvened for lunch. Over lunch, Dr. Tom Charlton, Vice Provost for Administration and Chair, Bush Presidential Library Center Project Steering Committee, addressed the board and ECS faculty on "The Future of the George W. Bush Presidential Library Center." Dr. Charlton provided his audience a list of "frequently asked questions," which outline Baylor's quest for the Presidential Library Center. He also provided a detailed explanation on a Presidential Library Center being "about the life *and times* of" a president and explained what sorts of materials, personal papers, and exhibits might be included in the George W. Bush Presidential Library Center.

Full Board Session

Dean Kelley reconvened the Board after lunch. Dean Swisher then facilitated discussion, touched on several topics:

- How can the Board of Advocates do to best have a lasting impact on students graduating from the School of Engineering and Computer Science, given the Baylor 2012 imperatives? Board members are "practitioners with better views of the technology impact on society that academy doesn't see."
- Mr. Maggio commented that life sciences data sets are growing larger, and technology has been slow to arrive in the life sciences fields.
- Mr. Sheets commented that curriculum should be flexible in order to meet changing technology demands.
- The Board asked about new program developments, such as cheminformatics. Dean Kelley updated the Board of this progress, stating ECS is working with the Department of Chemistry;

however, the student demand does not appear as high as it was during the development of bioinformatics. There are more biology majors than chemistry majors.

- Ms. Tyrrell asked about development of "engineering management," which would result in technical skills with leadership development. Dr. Bradley indicated ongoing discussions with the School of Business to use existing MBA curriculum, tailored for engineers. When asked about the difference between an undergraduate degree in engineering followed by an MBA, the ideas included (1) the result would be "technology-specific management," (2) the courses would be taught by engineers, not business faculty, and (3) the focus would be on managing technical people."

- Mr. Mearse discussed the need for new graduates to have necessary soft skills. Graduates must be able to interact with others, especially during tough economic times, like today. He said companies look for collaboration skills as they want their workforces to work as a team.

- Dr. Farison asked about offshore manufacturing and the implications for ECS graduates. Mr. Swisher responded that many companies are moving operations off-shore, and this makes it difficult to "build new" or have an impact on the marketplace. Mr. Mearse said that, while commodity skills are being moved off-shore, a different work ethic emerges from those off-shore cultures. As a result, today's graduates need additional skills. Mr. Sedate added that these additional skills will aid in understanding how to adapt to a different culture and work ethic. Some debate followed between the board members regarding the success and failure of their companies' efforts to move operations off-shore, and there was a wide range of success and failure reported among the Board members. This issue concluded with a discussion of "credibility," and Mr. Aldrich said, "Credibility comes from experience. We need people who started as doers who become leaders of doers."

- Mr. Sheets reported that process/test engineering fields are declining fields, while operational roles are emerging along with design fields.

- Mr. Aldrich asked how much of the enrollment in the computer science masters program was influenced by the economy. Dr. Speegle answered that a high percentage of enrollment was the result of the difficult current economy. Mr. Aldrich pointed out that these "excess" graduate students will be available when companies are looking to hire higher-level educated students.

- What are some strategies for current underclassmen? Mr. Stripling suggested more exposure to industry. Mr. Booth gave an update on student internships. Dean Kelley reported that students fall out of their course sequence when they spend semesters in coop programs; as a result, there is not much coop activity. Mr. Stripling added that, with not much new business, his company (L3 Communications) is scaling back relationships with universities.

- The Board agreed that the combination of computer science and engineering ECS's programs offer results in a balanced mix. However, Mr. Sedate questioned whether the focus should be on great teaching or great research. He said, "Strategic decisions are similar in business: how do we do both best?" Dr. Bradley added, saying, "It's a matter of character, not just training."

Student Presentation

Following a break, the Board reconvened and heard a presentation by Mr. Aaron Wegner and Mr. Dwight Horne. Messrs Wegner and Horne, computer science students, gave a report on a project relating to security they accomplished for Texas Life Insurance.

Summary Reports

Following the students' presentation, the Board heard reports from the morning breakout sessions. Mr. Sheets reported on the engineering session, and Mr. Swisher reported on the computer science session.

Mr. Mearse gave some summary statements regarding the day's topics. He said the board heard recurring themes relating to student development and soft skills. The Board of Advocates, he said, can provide specific assistance in development soft skills in venues such as workshops. Mr. Mearse volunteered to coordinate via email with board members to move this idea into a plan of action.

Dean Kelley next asked the board regarding the Spring 2003 meeting. The date of the meeting, April 4, 2003, was agreed upon; however the location was not. He offered some closing remarks expressing appreciation to the Board, and he said, "your time spent influences what we do." He said the School makes changes that reflect changing priorities, and he said; "Our changes are moving us in a forward direction."

Following the Dean's remarks, the Board adjourned from the meeting to pose for a group photograph. The meeting concluded at 4:10 p.m.