BAYLOR UNIVERSITY
General Engineering
BSE/EGR Program

What Is This Animal……
General Engineering?

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ECS Board of Advocates
October 5, 2012

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It's A New Day!

- And things are great!
- Things have changed!
- And things are busy!

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B.S.E. … General Engineering

- BU ABET Engineering Accreditation
  - 1988….one program….BSE
  - 1994….one program….BSE
  - 2000….three programs….BSE, BSECE, BSME
  - 2006….three programs….using assessment
  - 2012….three programs….have graduate programs
    - First time with BoA breakout session….Thanks!

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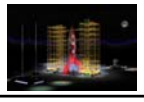
So….What is it….BSE/EGR?

- You can call it….
  - Our legacy program
  - Jim Farison's baby
  - The program time forgot
    - and some faculty members too
- You will call it in the future….
  - The best of engineering education
  - ECS's hallmark program
  - The quintessential Baylor engineering program
  - The launching pad



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What it Is Today?
Curriculum & Structure Perspective

- Meticulously documented (the JBF effect)
- Two options
  - Flexible Option…with seven possible stems
    - *Biomechanics, Biomedical Signals, Computer Systems, Electronics, Fluids and Thermal Energy, Mechanical Design, Signal Processing*
    - With prescribed stem courses plus stem and concentration electives
  - Biomedical Option
- Both paths are sound…½ students in BME track

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What it Is Today?
Organization & Administration Perspective

- Division of General Engineering (in one's mind ☺)
  - Director of General Engineering (unauthorized volunteer)
  - 100% of courses offered by ECE, ME & CS (no problem)
  - A cadre of faculty who support and get it
  - A new BSE faculty committee (Thomas & Newberry invited)
  - Administrative support by committee (↑X-mas presents)
  - 47 sophomore-senior students

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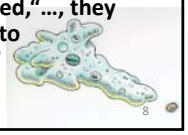
What Will it Be Tomorrow?

- 100 students…then beyond
- Deeper general engineering
- Fewer micro stems…more major options
  - ??? Petroleum, Industrial, Aero, Energy, Mechanical, Computer, Electrical….
  - Those that are needed…make sense…that fit…
- The cream of ECS students
- Talented…cut from a different mold…creative

Pseudo Random Quotes…

- John Calabrese….GM VP of Global Engineering
  - 21-Sept-2012
- "Colleges need to create multidisciplinary engineering departments to give students a variety of skills."
- "Universities are very silo-structured,"…, they need to take that to the next step to have interdisciplinary curriculum."



First Things First

- Get Operational
  - Tend to ABET findings (☹)….six years or bust!
  - Get familiar
  - Student Advising
  - Efficient forms and systems
  - Become official….whatever that means

Second Things Next

- Build student enrollment…we can do that!
- Win over the faculty…and staff
  - And the Dean…and he's pretty sharp

- Become "Official"
- Organize winning "options" or minors or certificates or useful value-added that fit.

The Form 1

High Resolution Desktop 3D Printer

- http://formlabs.com/
- David Cranor…
  - A Baylor BSE/EGR graduate

Now back to ABET…

- What the Dean said….
- The evaluators also found some issues…the program needing the most work was BSE
  - It was considered "deficient" with respect to evaluating student outcomes
- "Deficient" means the program doesn't meet one of the ABET Criteria

This Means….

- BSE/EGR students were not separately evaluated in classes…and were the minority
  - This includes Junior and Senior Design
  - ECE and ME also cited
- Not enough feedback on FE exam and Senior Exit Interview
  - Not the situation for ECE and ME

The ABET Lingo

- ABET accredits engineering and related programs
- Volunteer organization
  - O'Neal, Jordan, and Kelley are Program Evaluators
- Set of Criteria
- Institution prepares self-study report

Criterion

1. Students
2. Program Educational Objectives
3. Student Outcomes
4. Continuous Improvement
5. Curriculum
6. Faculty
7. Facilities
8. Institutional Support

3. Student Outcomes (pg 3)

A-K…..the ability to….

a) Apply stem knowledge
b) interpret experiments
c) Design systems…
d) Function on teams
e) Solve engr problems
f) Professional & ethical responsibility
g) Communicate effectively
h) Global, economic, environmental context
i) Life-long learning
j) Contemporary issues
k) Modern engineering tools

Now…We concentrate on ABET

Six years or bust!

- Junior and Senior Design course evaluations will be identified by major
  - beginning immediately
  - Including senior exit survey

- ECE and ME use FE exam results for a) and e)
  - EGR will require all students to submit a junior and senior a) & e) portfolio
  - Gives two data points for assessment

2. Program Educational Objectives

- Broad statements that describe what graduates are expected to attain within a few years of graduation.
- Some were more "attitudes" than "attain"
- Survey to alumni asked to comment on "department's" achievement rather than their achievement.

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PEO Examples

- Graduates have the knowledge and skills necessary for success in a professional environment
- Should be….for example
- Graduates will succeed in entering engineering practice
  - As measure by the % employed in the profession

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How Did We Get Here?

- Dean didn't ride herd on departments
  - Can we blame this on Dean O'Neal?
- Single part-time BSE/EGR volunteer administrator
- Bad timing of transition…and health
- Assessment (not grading) in background
- Creates Lemon-to-Lemon Aid opportunity

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What We Need To Do…for ABET

- Get the assessment issues worked out
  - Junior and Senior Design onboard
  - Those two courses are a good chunk of assessment
- Get the jr / sr portfolio details worked out…now
  - Through the new BSE committee
- Revise the BSE Program Educational Objectives
  - Advocate Board, Faculty, Students….
  - Alumni survey

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for ABET….. Con't

- Get Official
  - Job description, duties, responsibilities, organization
- BSK will work on details
  - In concert with new BSE Committee
  - Input and approval from Dean O'Neal

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What We Need to Do for…Advising

- Locate student advising information
- Learn and process needed forms, etc.
- Find/update/modify BSE documentation
  - For efficiency
  - On the internet
- Ad hoc from ABET reviewer
  - BSE advising needs improving

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What We Need to Do for Tomorrow

- Streamline the curriculum
  - Greater engineering depth and commonality
- Opportunities for value-added stems
- Opportunities for other value-added programs (minors, certificates, etc.)
- Be responsive and proactive to the needs of students and ECS

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Other "Things"

- Pre-Engineering
- ECS LLC Residential College
- Technical Entrepreneurship
- Faculty Appointments
- Development

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Feedback, Observations, Suggestions

Let's get to work