Baylor Engineering!

Doesn't that sound great?

npr
103.3fm | kwbu.org
13th Anniversary
We tell stories. Waco's NPR.

BSE In Perspective

- The original ABET accredited engineering program
  - Since 1989 (quarter century)
  - Contained ECE and ME paths
  - *Jim* Bargainer, *Jim* Warren, *Jim* Farison…
- ECE and ME separated in 2000….BSE continues
- BSE became *General Engineering*
  - Biomedical option with five BME courses
  - Flexible option with eight stem possibilities
  - Individualized custom path

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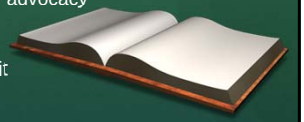
Priorities

- Emphasis has rightfully been building the departments
  - Faculty hires
  - Staff hires
  - Graduate programs
  - Student recruitment
  - Facilitates and equipment

- BSE existed much for sentiment and not wanting to kill off an accredited program.
  - Plus there was talk of its value and potential
  - A minority of staunch advocates

Exposed

- The 2012 ABET visit exposed BSE's overlooked status
  - Program's leadership evaporated
  - Report comprised of sections "lifted" from ME & ECE
  - No specific assessment of BSE student outcomes
    - Based on aggregate/FE results judged invalid
  - Educational Objectives unacceptable
  - No resources or budget or advocacy
  - And so on and so on….
- Show cause/not-to-accredit
- Should fire the dean!



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Damage Control Resurrection

- Heros de-aggregated the student assessment data
  - Drs. Garner and Newberry and others
- Advocate Board responded with feedback
- The dean stepped up with support
- A new student Can-Do portfolio assessment implemented
- The two engineering departments responded
- Resulted in a remarkable change from "do not accredit" to full six-year accreditation.

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BSE Program Educational Objectives

Remains Sufficient?

Within a few years of graduation, Baylor B.S.E. students will:

1. establish themselves as a competent, successful, and responsible member within their chosen profession, as evidenced by such indicators as promotions, raises, recognitions, and increased responsibilities, or,
2. be engaged in post-baccalaureate study as demonstrated by earning or making progress toward an advanced degree.

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Changes

- Philosophical
  - What does Baylor/ECS need the BSE to be?
  - What benefits can the BSE bring to the table?
  - What needed elements will make the BSE attractive?
  - What administrative changes are required?
- Answers
  - Needs to compliment and bring added value.
  - Attract brightest and creative students.
  - In demand paths not available otherwise.
  - Appoint the one who allowed the mess to lead redesign.

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Foundational

- Accreditation
  - Curriculum un-assessible because of small course commonality among all the paths and stems
- Curriculum
  - Broaden depth to reflect *General Engineering*
- Assessment
  - Implement systematic and individualized outcomes assessment in lieu of FE exam results
  - Involves ME and ECE processes as well as *Can-Do* Portfolios

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Can-Do Portfolio

- For assessment of student outcomes
- i-k student outcomes
- ME & ECE use FE results to assess (a) and (e)
  (a) apply knowledge of math, engineering and science
  (e) identify, formulate and solve engineering problems
- Each Jr & Sr semester students submit coursework artifacts
- Artifacts assessed according to mastery rubric

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Curriculum

Are these right?

- Required engineering courses were….
  - Two Freshman engineering courses (intro & analysis)
  - Statics and Circuits
  - Junior Design and Senior Design
- Added to engineering requirements for BSE
  - Dynamics and Thermodynamics
  - Digital Logic and lab; Automatic Control Systems
  - Instrumentation and Measurements Lab
- Meets required engineering credits for ABET!

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Value Added

- No weak link (just the opposite)
  - ECE and ME sufficient individually
- Biomedical Engineering exists
  - Five BME courses
  - Dang good fit
- Others asked about or in demand or good fit….
  - Real possibilities here for flavors
- New curriculum assures accreditability…
  - Within the BSE/ECS/BU umbrella

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BSE….with a….

- Engineering-ish Minor
  - Six courses
  - ECS contributes some of these courses
  - Can include “Engineering” in the description
- Stem or Option
  - Perhaps minor without “engineering” title
  - Courses toward career goal or objective
  - Courses already offered by ECS
  - Courses already offered at Baylor

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Consider….

- Biomedical *Engineering*
  - Five courses exist
  - Option or minor
- ~~Chemical~~
- GeoReservoir
- Environmental
- Humanitarian Engineering minor
- Engineering Education

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Progress

- Biomedical: Well underway
- GeoReservoir
  - Six Geology courses including Engineering Geology
  - Partnership with Geology Department
  - Vetted with industry
- Environmental
  - Six Environmental Science courses

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Next Up?

- Humanitarian *Engineering*
  - Compliments EM and existing efforts
  - Full minor
  - Baylor fit
- Engineering Education
  - Partnership with School of Education
  - Contributes toward teaching engineering in high school

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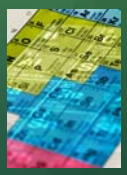
Other Elements

- Technical Entrepreneurship Certificate
  - Partnership with Hankamer
  - Courses offered as substitute
  - Business
- Project Management Certificate
  - Partnership with Hankamer
  - HSB courses
  - One course counts as technical elective



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Next Steps

- Implementation
  - Complete details
  - Catalog
  - Registrar
  - Advising
- Big Questions
  - Viable track
  - Adjustments
  - Others….What's next

Are we on the right track? What is missing?

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Previous Dean's Prerogative

- The ~~New~~ Dean
- A-OK
- Sees the vision….what needs to be done
- Making appropriate changes and initiatives
- Respected by faculty and has their support
- Hear good support from administration

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