

*Proceedings*  
*Teaching Entrepreneurship to Engineering*  
*Students*

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Engineering Conferences International

*Year 2003*

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Moving Students with Entrepreneurial  
Mindsets to Being Technology  
Entrepreneurs

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# Penn State's Engineering Entrepreneurship Minor

**ECI Conference – Jan.12-17, 2003**

*<http://e-ship.ecsel.psu.edu>*

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**GE Learning Excellence Fund 2001- 2003**

5/20/03





# Background

- Penn State awarded 2-year GE Learning Excellence Fund Grant, January 2001 start:  
Problem-Based Learning in Entrepreneurship (PBLE) Program  
First courses – Fall 2001
  
- Goals:
  - ✓ leverage GE Funds to launch *Engineering Entrepreneurship Minor in College of Engineering*
  - ✓ *Establish close ties to Smeal College of Business, School for Information Sciences and Technology (IST), and Entrepreneurship Program at Penn State Altoona.*



## **Mission: PBLE Program and E-SHIP Minor**

- Deliver cross-disciplinary, collaborative, problem-based learning opportunities in entrepreneurship focused on undergraduate engineering, business and IST students.
- Support development of entrepreneurial “mindset”



# Entrepreneurship

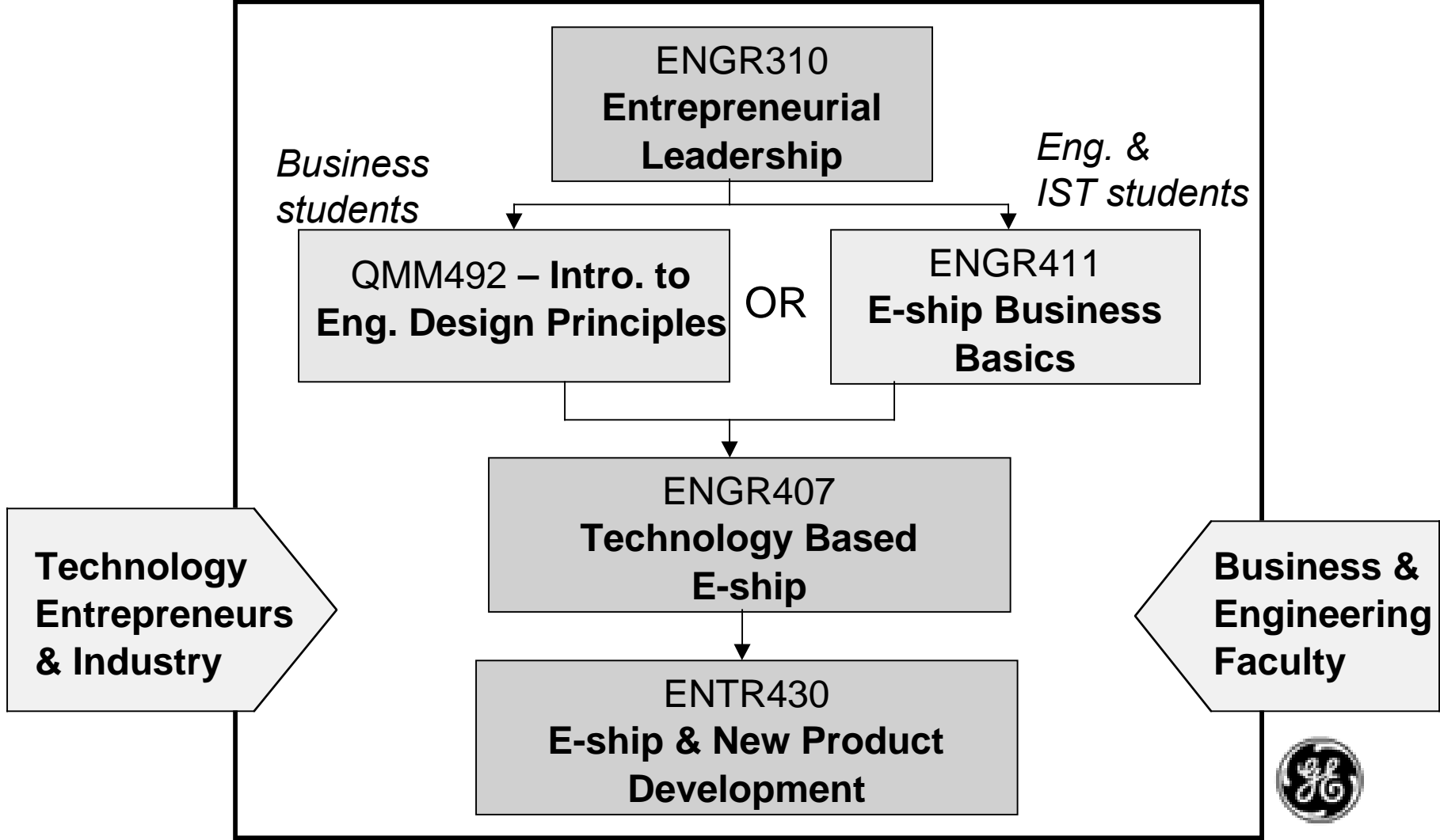
- **Definition:**
  - Ability and desire to create and build something of value from idea or concept.
  - Create new long-term value for a product or company with personal vision, passion, risk-taking, hard work and creativity.
- **Entrepreneurial skills are of value in**
  - start-up companies
  - inside existing companies (intrapreneurship),
  - creating new business alliances



# Engineering E-Ship Minor

- **E-Ship Minor approved April 2002**
- **Minor = Core courses (12 credits) + Elective courses (6 credits)**
- **Unique features:**
  - **Minor provides student “cross-training”**
    - *Business students get engineering basics*
    - *Engineering & IST students get business basics*
    - **Business faculty teaching Bus. Basics course; solid tie to Smeal**

# E-SHIP Minor Core Courses (12 credits)





# E-Ship Minor Supporting Courses

- 6 additional credits to broaden technology skills and business knowledge
  - STS (Science, Technology and Society)
  - Business students take intro-level IST and engineering courses
  - Engineering students take business & IST courses
  - IST students take intro. engineering and business courses
  - ENGR497B (3 credit) for Stage II Teams: industry projects as well as continued student-developed product ideas





## Fall 2002

- NCIIA Grant (three year) awarded: *E-Ship Venture Fund and Competitions*
  - Funds for E-Ship student team product prototyping
  - Awards
  - Expanded E-Ship Competition in Spring – All-PSU
  
- E-ship Events Series for students, faculty, local entrepreneurs; four events (Bob Beaury)
  
- E-Ship Competition – new two stage process
  -  5 minute elevator pitch competitions – all teams
  -  Top teams attend Product Showcase Dec. 12 with product prototypes, brochures



# Challenges

Finding faculty interested in entrepreneurship at University Park plus all Commonwealth campuses

- Starting Spring 2003: Penn State Entrepreneurship Programs Network E-SHIP
  
- Student Assessment
  
- - on-going analysis of student's growth in creativity, self-efficacy, teamwork, communication skills while in E-SHIP Minor, plus after graduation
  
- - important to show the "value proposition" of the E-SHIP Minor, courses and activities for future funding, etc.