ABET Course Syllabi for INDE 496: Technology-based Entrepreneurship

1. **Course number and name:** INDE E 496: Technology-based Entrepreneurship
2. **Credits and contact hours:** 3 credit hours, 4 hours per week

3. **Instructor’s name:** Thomas A. Furness III

4. **Text book, title, author, and year**

4a. **Other supplemental materials**:
   - TED Talks about entrepreneurship
   - Altucher, James. *How to be the luckiest person alive!* –(ebook-download) – 2011
   - Other supplemental readings from:
     - Harvard Business Review
     - *Discovering New Business Opportunities* – Jack English and Babette Moate
     - *The Art of the Start* – Guy Kawasaki
     - *Welcome to the Experience Economy* – Gilmore & Pine
     - *How to be the luckiest person alive!* – Altucher
     - *First you break all the rules* – Buckingham & Coffman
     - *The Innovator’s Dilemma* – Christensen
     - *Seeing What’s Next* – Christensen, Roth, Anthony
     - *The Age of the Spiritual Machine* – Ray Kurzweil
     - *Accelerating Intelligence* – Ray Kurzweil
     - World Future Society Predictions + a Challenge to those predictions
     - National Academy of Engineering: Grand Challenges
     - *First break all the rules* – slideshare – Alex Grech
     - Disruptive Technology Forecast 2011

5. **Specific course information**
   5a. **Brief description of the content of the course** (catalog description):
      This course concentrates on hands-on aspects of creative problem solving, innovation and entrepreneurial enterprise in product development.
   5b. **Prerequisites or co-requisites:** NONE
   5c. **Required, elective, or selected elective (as per Table 5-1) course in the program:**
      Elective for d (Design).

6. **Specific goals for the course**
   - Students will examine relationships between ideation, invention, innovation, iterative prototyping, testing and marketing. In turn, students will identify market

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1 Note: The instructor for this course has had extensive experience in technology-based new business startups (25 companies, 2 traded on NASDAQ at a market capitalization of > $7B) and will draw intensively on that experience in teaching the course.
opportunities, create new technology-based products and services to satisfy customer needs, and construct a plan for developing, marketing and distributing a product.

6a. Specific outcomes of instruction
• The course is organized into three parts: creation/ideation process, decision process, execution process. The learning outcomes of each are given below:

Part 1: Creation/Ideation
- Gain an understanding of the processes of creation, including the elements of environment, culture, practice and
- Develop an understanding of how to use tools that stimulate creativity
- Develop an understanding of tools that organize the creative process
- Develop skills in using tools for creation and critical thinking.

Part 2: Decision Process
- Show the ability to work within the dynamic framework of assessing the interaction of ‘technology pushes’ and ‘application pulls’ to identify useful product concepts and address societal needs that have built-in market potential including the following:
  - How to look at grand challenges
  - Learn Furness Dynamic Framework (FDF) for achieving marketable products
  - Conduct a ‘what if’ exercise to link elements of foundational science and enabling technologies to product ideation, markets and fulfilment of grand challenges
  - Learn to differentiate between ‘what’ and ‘so what’

Part 3: Execution
• Demonstrate introductory knowledge of the commercialisation pathway broadly, and more specifically for technology-based applications including:
  - Identifying appropriate route-to-market strategies for your technology
  - Business models and start-up funding opportunities
  - Intellectual Property protection strategies
  - Guerrilla marketing
• Act professionally by:
  - Communicating in writing (social media, blogging, venture feasibility analysis)
  - Communicating verbally (pitching to an investor)
  - Working independently and in teams

• Students will have the ability to apply engineering design methods to represent, integrate and solve problems, including the ability to recognize problem context and integrate knowledge and skills appropriate sources.
• Students will have the ability to communicate effectively.
Students should possess the following professional characteristics: leadership, ethics, the ability to work with others, and an appreciation for other disciplines.

Students will have an understanding of the integrated, broad nature of the IE discipline with an appreciation of the depth of the field and an ability to find information, when needed.

6b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
   c) an ability to design a system, component, or process to meet desired needs
   e) an ability to identify, formulate, and solve engineering problems
   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
   j) a knowledge of contemporary issues.

7. Brief list of topics to be covered
   - Ideation and Critical Thinking Methods
   - What makes an idea good?
   - Self Analysis of Skill Sets and Passions
   - Review of Grand Challenges and World Demographics
   - Reading the waves and trends in the market place
   - Decision Making process related to product focus
   - Product Development Strategies
   - Marketing Strategies
   - Business Plan Development
   - Financing Strategies
   - Intellectual Property Consideration