Bioengineering in the Service of the Living World:
A Collaboration between Binghamton University & Southern Tier Independence Center

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Today’s Agenda

- Our Philosophy
- Approach to Grading
- Course Structure
- Projects
- Typical Budget
- Timelines
Our Philosophy: To Make Gentle the Life of the World

- Basic Premise: Colleges exist in service of others
- Senior design is the most important course in the undergraduate career.

Why?
- Beginning careers
- Gateway to a first professional job
- Synthesizes everything learned
- Clarifies future

- Develop leadership and professionalism
My Experience

• Louisiana State University 1981-1993
  • Considered one of the finest capstone design courses in the nation
  • Competed successfully in collegiate design competitions
    • Formula SAE
    • Mini Baja
    • Human Powered Vehicle
    • Top Fuel Eliminator Dragster (Competed at Cajun Nationals)
• Designed and delivered assisting devices for children and young adults with physical disabilities.
My Experience

- United States Military Academy 1993-2000
  - Totally revamped senior design
  - Brought national recognition to design program
  - Competed successfully in collegiate design competitions
    - Department of Energy Sunrayce
    - Mini Baja
  - Designed and delivered assisting devices for children and young adults with physical and intellectual disabilities.
    (SPI N -- Special People in the Northeast)
Sunrayce

Sunrayce 99
1300 miles of solar-powered racing
Atlanta coverage by Cyber Motorsports
June 20 – 29, 1999
Washington, DC to Orlando, FL
Busy Box for Housebound Children
Mouse for Limited Muscle Control
My Experience

• Binghamton University 2000-2006
  • Designed and taught the multi-disciplinary design course that exists in Watson today (Mechanical, Electrical and Computer Engineering)
  • Brought national recognition to design program
  • ABET praised the course as innovative and exciting
  • Competed successfully in collegiate design competitions
My Experience

- Mini Baja
- High Mileage Vehicle
- Formula SAE
- Robots

Binghamton University Today
- Recently I have been charged with teaching Senior Design in bioengineering
- My first step – establish collaboration with STIC and Ms. Cheri Robinson
- First two years have been a tremendous success
- Our efforts have been identified as exemplary and the project reports are being distributed nationwide as some of the very best in the nation. (ABET 2012)
My Approach to Grading

- Simple Methodology
  - Design project is completed, delivered to and accepted as satisfactory by clients  
    Grade A, A- or B
  - Design project is either incomplete or is not accepted by clients  
    Grade F or I

- Question: Have I ever given an F or an I to students here at Binghamton University?

- Answer: Yes I unfortunately have. They came back over the summer to complete the project and deliver it to their client. That happened to six students during my time teaching the Watson design course.
Rationale for My Grading Policy

- Gateway to your professional careers
- Professionalism
- Commitment to:
  - Yourselves
  - Team mates
  - University
  - Community
  - Most importantly: Your clients
Course Structure

• Fall term
  • Design tools
    • Creativity
    • Leadership and team effectiveness
    • Project management
    • Ethics
    • Environmental and societal contexts and impacts
  • Completed Conceptual Design
    • Formal oral presentation
    • Formal written report
Course Structure

- Spring term
  - Completed Design
    - Accepted by Client
    - Formal oral presentation
    - Formal written report
  - Presentations: A Celebration of Design
    - Public Event
      - Community and university officials
      - Media (TV and Newspapers)
Budgets (Subject to change)

- Each student in senior design will be allotted $100 by the Department of Bioengineering towards completing the design project
  - For example, a team of four students would have a budget of $400 to complete the project
  - Any additional expenses are the responsibility of the student design team
  - We will strictly follow NYS guidelines in the use of these funds
  - More information will be made available at the start of the fall semester
## Timeline: Fall 2012

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
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<tbody>
<tr>
<td>Sep 4</td>
<td>Project Day</td>
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<tr>
<td>Sep 7</td>
<td>Final date for selection of project and team</td>
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<td>Sep 28</td>
<td>Statement of Work</td>
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<td>Nov 15</td>
<td>First draft of conceptual design report</td>
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<tr>
<td>Prior to Dec 7</td>
<td>Dress rehearsal of oral presentation</td>
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<tr>
<td>Dec 13</td>
<td>Formal presentations</td>
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<tr>
<td>Dec 13</td>
<td>Final conceptual design report</td>
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## Timeline: Spring 2013

<table>
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<th>Date</th>
<th>Activity</th>
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<tr>
<td>Feb 5, 7</td>
<td>Formal reviews of conceptual design</td>
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<tr>
<td>Mar 5, 7 &amp;</td>
<td>Intermediate Design reviews</td>
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<td>Apr 5, 7</td>
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<tr>
<td>May 2</td>
<td>First draft of final design report</td>
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<tr>
<td>Prior to May 2</td>
<td>Dress rehearsal of oral presentation</td>
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<tr>
<td>May 9</td>
<td>Formal presentations: Celebration of Design</td>
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<tr>
<td>May 9</td>
<td>Final design report</td>
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Projects

- Global Community
- Local Community
- Native peoples in Peru
- Others
Adaptive Row Boat: Sky Lake Camp
Water Flotation Device: Sky Lake Camp
Shopping Cart Mobility Device: STIC
Speech Disorder Training
Website: STIC
Metabolic Disorder Cooling Vest: STIC
Multiple Appliance Controller
Device: STIC
All Terrain Wheel Chair: Sky Lake Camp
Traction Exercise Device: Unicorn Electronics
Affordable Portable Lift
Final Thoughts

- New course and new challenges.
- BU and STIC together have a chance to make a difference in the lives of people both in our local community and worldwide.
- We welcome your thoughts and questions.
- Even more..we welcome your project ideas!