Does your company have potential BE Capstone Design Projects?

Do you want to support the BE Capstone Design Program?

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Support BE Capstone Design Projects for:
• Solutions to industry challenges
• Future employees with experience

Real world design projects:
■ Solved by student teams
■ Advised by faculty
■ Supported by industry

Specialty areas:
• Bioenergy Engineering
• Biomedical Engineering
• Ecosystems Engineering
• Food Engineering
A Capstone Design Project:  

- Requires engineering design  
- Combines biology and engineering  
- Solves a real problem  
- Uses a holistic and systems approach  
- Interprets data and statistics  
- Interprets social and environmental impacts  
- Evaluates economic feasibility  
- Delivers a comprehensive, professional design report  
- Presents to industry, faculty, general community, and peers  

Recent Project Examples:  

- **Bioenergy Engineering**  
  - **Torrefaction Process Improvement**  
    Increase product yield of torrefaction process.  
    Sponsor: Heat Transfer International  
  - **Wastewater Treatment Using Anaerobic Digester**  
    Design and develop a novel, efficient pilot-scale (0.45 m3) upflow and fixed film anaerobic digester.  
    Sponsor: Technova  

- **Biomedical Engineering**  
  - **Dried Blood Storage Device**  
    Filter paper to efficiently dry and store blood samples.  
    Sponsor: Pfizer, Inc.  
  - **Design of a LED/Fiber Optic Treatment for Infant Jaundice**  
    Design a portable, wearable, cost-efficient treatment for infant jaundice.  
    Sponsor: Sygiene  

- **Ecosystems Engineering**  
  - **Site Evaluation and Design Plan for a Created Forested Wetland Student**  
    Designed wetland for US 27 road construction site.  
    Sponsor: Michigan Department of Transportation  
  - **Water Quality Best Management Practices Design for a City of Lansing Re-Development Project**  
    Design of an efficient stormwater runoff treatment system for a parking lot re-development.  
    Sponsor: Tetra Tech  

- **Food Engineering**  
  - **Hydroponic Processing Optimization for Mung Bean Sprouts**  
    Optimization of hydroponic system for mung bean sprouts.  
    Sponsor: ConAgra  
  - **Redesign of ProMix Batter Mixer Cooling Mechanisms**  
    Redesign batter coolant system.  
    Sponsor: JBT FoodTech  

Faculty:  

- Evangelyn Alocilja, Ph.D.  
- Kirk Dolan, Ph.D.  
- Darrell Donahue, Ph.D., P.E.  
- Daniel Guyer, Ph.D.  
- Tim Harrigan, Ph.D.  
- David Hodge, Ph.D.  
- Amor Ines, Ph.D.  
- Dana Kirk, Ph.D., P.E.  
- Wei Liao, Ph.D., P.E.  
- Yan "Susie" Liu, Ph.D.  
- Bradley Marks, Ph.D., P.E.  
- Jade Mitchell-Davis, Ph.D.  
- Pouyan Nejadhashemi, Ph.D.  
- Fei Pan, Ph.D.  
- Wendy Powers, Ph.D.  
- Luke Reese, Ph.D.  
- Dawn Reinhold, Ph.D.  
- Steven Safferman, Ph.D., P.E.  
- Chris Saffron, Ph.D.  
- Ajit Srivastava, Ph.D., P.E.  
- Truman Surbrook, Ph.D.  
- Tim Whitehead, Ph.D.  

Since 1906, the Department of Biosystems & Agricultural Engineering has responded to the changing needs of society by integrating and applying principles of engineering and biology in a systems context. Today, biosystems engineers at MSU solve complex, rapidly-changing problems related to food production, quality and safety, ecosystems protection, homeland security and health protection, biomass utilization, and renewable energy development.  

Biosystems Engineering (BE) is an ABET accredited B.S. degree program at MSU that prepares students to:  
- Identify and solve problems at the interface of biology and engineering, using modern engineering techniques and a systems approach.  
- Analyze, design, and manage systems and processes that involve critical biological components.