

Does your company have potential BE Capstone Design Projects?



Do you want to support the BE Capstone Design Program?

Support BE Capstone Design Projects for:

- Solutions to industry challenges
- Future employees with experience

Contact:

Dr. Steven Safferman
Michigan State University
Biosystems & Agricultural Engineering
212 Farrall Hall
East Lansing, MI 48824
(517) 432-0812
safferma@msu.edu



COLLEGE OF
AGRICULTURE
AND NATURAL
RESOURCES

Michigan State University
Biosystems & Agricultural Engineering
216 Farrall Hall
East Lansing, MI 48824

MICHIGAN STATE
UNIVERSITY

BIOSYSTEMS ENGINEERING

Capstone Design Projects

Real world design projects

- Solved by student teams
- Advised by faculty



MSU is an affirmative-action, equal-opportunity employer.

Specialty Areas:

- Bioenergy Engineering
- Biomedical Engineering
- Ecosystems Engineering
- Food Engineering



Integrating Engineering and Biology Since 1906

A Biosystems Engineering Capstone Design Project:

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



What is Biosystems Engineering?

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.

Recent Representative Projects:

■ Bioenergy Engineering

Biodiesel Production in Malawi

Process, economic, and safety evaluation tools to produce biodiesel in Malawi.
Sponsor: Engineers Without Borders

Turkey Litter to Energy

Thermal conversion system to create heat energy from turkey litter.
Sponsor: Western Michigan Greenhouse Association

■ Biomedical Engineering

Dried Blood Storage Device

Filter paper to efficiently dry and store blood samples.
Sponsor: Pfizer, Inc.

Sprout Pathogen Detector

Disk assay *E. coli* detection method to detect impacted sprouts.
Sponsor: Living Foods, Inc.

■ Ecosystems Engineering

Ammonia Emissions to Fertilizer

Full-scale biotrickling filter design to capture and recover farm emissions.
Sponsor: Shady Side Farm

Two Stage Channel Design

Regional curves for the design of stable stream channel cross-sections to minimize bank erosion.
Sponsor: The Nature Conservancy

■ Food Engineering

Rapid Post Harvest Cherry Cooling

Pre-cooling/flushing well water systems to uniformly and economically cool cherries.
Sponsor: Cherry Bay Orchards

Post Processing Microbial Control on Shelled Chestnuts

Microbial growth control on chestnuts to enable a longer shelf life.
Sponsor: Chestnut Growers, Inc.

Faculty:

Evangelyn Alocilja, Ph.D.
Kirk Dolan, Ph.D.
Daniel Guyer, Ph.D.
Tim Harrigan, Ph.D.
David Hodge, Ph.D.
Wei Liao, Ph.D., P.E.
Yan "Susie" Liu, Ph.D.
Bradley P. Marks, Ph.D., P.E.
Pouyan Nejadhashemi, Ph.D.
William Northcott, Ph.D.
Wendy Powers, Ph.D.
Luke E. Reese, Ph.D.
Dawn Reinhold, Ph.D.
Steven Safferman, Ph.D, P.E.
Chris Saffron, Ph.D.
Ajit Srivastava, Ph.D., P.E.
James Steffe, Ph.D., P.E.
Truman Surbrook, 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.