

## 2018 Biosystems Engineering Showcase

April 26, 2018

A.W. Farrall Hall &  
Marriott at University Place

East Lansing

### **Biosystems Engineering**

Graduates of the MSU Biosystems Engineering Undergraduate Program are expected to succeed in diverse careers where they integrate and apply principles of engineering and biology to a wide variety of globally important problems. MSU Biosystems Engineering graduates are expected to attain that success by:

- identifying and solving problems at the interface of biology and engineering, using modern engineering techniques and the systems approach;
- analyzing, designing, and controlling components, systems, and processes that involve critical biological components; and
- demonstrating vision, adaptability, creativity, a practical mindset, effective communication skills for technical and non-technical audiences, the ability to work in diverse, cross-disciplinary teams, and a commitment to sustainability, continuing professional growth, and ethical conduct.

MSU Biosystems Engineering graduates are having a positive impact on the world working in the areas of food: food safety and quality; environment: sustainable ecosystems and resource conservation; energy: bioenergy and bioproduct solutions; and health: diagnostics, systems models, and risk-assessment tools to enhance public health.

# Schedule

## Program

### Auditorium - 116 Farrall Hall - 524 S. Shaw Lane, East Lansing, MI

3:00 - 3:50 p.m. Senior Student Design Presentations (scheduled at 10 minute increments)

- Team 5- JBT - Spiral - Poultry Sheet Meat Processing Equipment Line Optimization  
Steve Hogan, Meaghan Rea, Nicole Rigdon, and Jordan Sica
- Team 2 - Covance - The Process Professionals - Nutritional Analysis Sample Preparation Optimization  
Nate Garpiel, Emma Heckelsmiller, Paige Leppanen, and Serenity Skillman
- Team 3 - Meijer - Milkin' It - Milk Plant Dana Management Implementation  
Eric Lausch, Brock Roelofs, Melissa Schneider, and Ryan Scott
- Team 4 - Bimbo Bakeries - L'Oven It - Oven Operation Analysis and Optimization  
Morgan Harris, Eric Klein, Aleks Popovic, and Anthony Tomaski
- Team 8 - MDOT - Team OO - Phosphorus Removal from Wastewater  
Emily Banach, Jessica Carleton, Anna Nelson, and Joshua Shah

3:50 - 4:00 p.m. Break

4:00 - 4:40 p.m. Senior Student Design Presentations (scheduled at 10 minute increments)

- Team 1 - Kellogg - Tony's Kronies - Oven Optimization  
Andrew Kovach, Eduardo Maya-Luevano, Monika Michalik, and Matthew Paxhia
- Team 9 - Student Organic Farm - Stem Meets STEM - Germination Chamber Design and Optimization  
Alex Darrow, Caitlin Knedgen, Linda Lay, Courtney Vanderhoof, and William Vanmaele
- Team 6 - Perrigo - Energy Pharms - Manufacturing Plant Energy Audit and Optimization  
Nick Servadio, Emily Willis, Kara Dean, and Alexandra Whitman
- Team 7 - MDNR - Crayfish Will - Red Swamp Crayfish Control in Michigan  
Elizabeth Ausmus, Alexis Kontorousis, Bolun Li, and Xin Tang

4:40 - 5:00 p.m. Break

### 2nd Floor Hallway Farrall Hall -

5:00 - 6:00 p.m. Reception, Student-Industry Interaction & BE 230 Poster Presentation

### East Lansing Marriott at University Place - 300 MAC Avenue, East Lansing, MI

6:45 - 8:30 p.m. Banquet Dinner (prior reservation required)



**BAE Chair**

Darrell W. Donahue, PE

## Message from the Chair:

BE Showcase is an annual event to highlight the accomplishments of our students. Showcase success would not be possible without the continued support of our alumni, board members, industry partners, university administration, parents and sponsors. Thanks to everyone who contributes to the continuing BE Showcase success.

# Participants

## Biosystems Design Project Participants

Elizabeth Renee Ausmus  
Emily Rose Banach  
Jessica E. Carleton  
Alexandra Elizabeth Darrow  
Kara Jane Dean  
Nathan Daniel Garpel  
Morgan Elizabeth Harris  
Emma Olivia Heckelsmiller  
Steven James Hogan  
Eric Albert Klein  
Caitlin Louise Knedgen  
Alexis Doreen Kontorousis  
Andrew Lloyd Kovach

Eric William Lausch  
Linda Marie Lay  
Paige Virginia Leppanen  
Bolun Li  
Eduardo Maya-Luevano  
Monika Danuta Michalik  
Anna Noelle Nelson  
Matthew John Paxhia  
Aleksandra Popovic  
Meaghan Rose Marie Rea  
Nicole M. Rigdon  
Brock Richard Roelofs  
Melissa Aubree Schneider

Ryan Paul Scott  
Nicholas Alexander Servadio  
Joshua Ajay Shah  
Jordan Lee Sica  
Serenity Eve Skillman  
Xin Tang  
Anthony Charles Tomaski  
Courtney Jordan Vanderhoof  
William Hunter Vanmaele  
Alexandra Katherine Whitman  
Emily Elizabeth Willis

# Staff



**Design Project Instructor**  
Dana Kirk, PE  
BE 485/487



**Design Project Instructor  
and Technical Advisor**  
Luke Reese  
BE 485/487



**Showcase Event  
Coordinator**  
Barb DeLong

# Team Projects

## Poultry Sheet Meat Processing Equipment Line Optimization - (3:00 pm)

Sheet meat processing is a specific poultry product application, for a frozen, ready-to-eat product. Sheet meat processing involves several equipment systems that result in product yield loss at each step, allowing for opportunities throughout the process to increase the overall product yield. The team designed an optimal sheet meat processing line using existing equipment from JBT FoodTech that will maximize the total yield of poultry and result in economic gain.



**Faculty Advisor**  
Bradley Marks, PE

**Sponsor**  
JBT FoodTech  
(under Non-disclosure)



Team Members (L to R)  
Steve Hogan  
Meaghan Rea  
Nicole Rigdon  
Jordan Sica



## Nutritional Analysis Sample Preparation Optimization - (3:10 pm)

The Process Professionals developed standardized sample homogenization protocols and corresponding process maps for a wide variety of food products. The goal of these recommendations was to increase sample throughput and reduce sample rework.



**Faculty Advisor**  
Ilce Medina Meza



**Faculty Advisor**  
Daniel Guyer

**Sponsor**  
Covance  
(under Non-disclosure)



Team Members (L to R)  
Nate Garpiel  
Paige Leppanen  
Serenity Skillman  
Emma Heckelsmiller

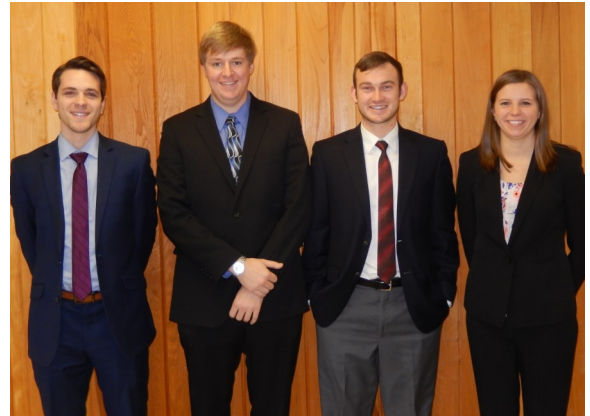


# Team Projects

## Milk Plant Data Management Implementation - (3:20 pm)

Team Milkin' It worked with the recently acquired Meijer Purple Cow production facility. The facility, located in Holland, MI, produces a range of milk products for all Meijer stores. The focus of the project includes the conversion of all data collection processes to digital recording methods as well as the analysis of production and quality data to identify areas of opportunity and implement quality management practices.

**Sponsor**  
Meijer  
(under Non-disclosure)



Team Members (L to R)  
Brock Roelofs  
Eric Lausch  
Ryan Scott  
Melissa Schneider



**Faculty Advisor**  
Yan (Susie) Liu



**Faculty Advisor**  
Kirk Dolan

## Oven Operation Analysis and Optimization - (3:30 pm)

Team "L'Oven It" worked with Bimbo Bakeries, USA, located in Beaverton, OR – a major producer of premium breads, buns and specialty rolls in the Pacific Northwest. From March to September, Bimbo Bakeries-Beaverton doubles their bun production output to match increased product demand. The oven Bimbo Bakeries-Beaverton currently uses to produce these buns does not deliver optimal baking performance due to the oven age, design, and outdated standard maintenance and operating procedures. To help Bimbo Bakeries-Beaverton, the team developed a set of standard procedures for both preventative and corrective maintenance practices. The team also created silicone bun models to act as mock product while profiling the oven's internal temperature eliminating product loss relating to this procedure.

**Sponsor**  
Bimbo Bakeries, USA  
(under Non-disclosure)



Team Members (L to R)  
Anthony Tomaski  
Aleks Popovic  
Morgan Harris  
Eric Klein



**Faculty Advisor**  
Sanghyup Jeong



# Team Projects

## Phosphorus Removal from Wastewater - (3:40 pm)

Michigan Department of Transportation (MDOT) expects the Michigan Department of Environmental Quality (MDEQ) to implement future surface wastewater discharge limits on phosphorus at the Dewitt Rest Area 831. Team OO designed and optimized two system options to reduce phosphorus to satisfy the anticipated limit: a subsurface mound and the electrochemical Waterloo Biofilter. The subsurface mound design focuses on removing the surface discharge component, while the electrochemical precipitation coagulates phosphorus for later filtration.



**Faculty Advisor**  
Steve Safferman, PE

**Sponsor**  
MDOT



Team Members (L to R)  
Emily Banach  
Anna Nelson  
Jessica Carleton  
Joshua Shah

**Team OO**  
"Your road to 'P' removal"  
Phosphorus Removal from Wastewater

## Oven Optimization - (4:00 pm)

In facilities that utilize ovens, the ability to maintain a consistent production environment is difficult due to seasonal atmospheric fluctuations. Our task was to define the relationship between environmental conditions and finished food quality based on direct gas-fired (DGF) oven profile fluctuations, and to develop a control plan for adjusting oven operation based on atmosphere changes in a facility.



**Faculty Advisor**  
Christopher Saffron

**Sponsor**  
Kellogg  
(under Non-disclosure)



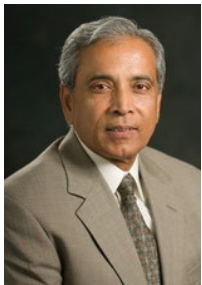
Team Members (L to R)  
Monika Michalik  
Andrew Kovach  
Eduardo Maya-Luevano  
Matthew Paxhia



# Team Projects

## Germination Chamber Design and Optimization - (4:10 pm)

Stem Meets STEM designed and optimized a low-tech, automated germination chamber to minimize labor requirements. A germination chamber facilitates the efficient germination of seedlings for transplant production, allowing staff to have more uniform and consistent seedlings available for planting year-round.

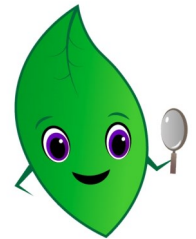


**Faculty Advisor**  
Ajit Srivastava, PE

**Sponsor**  
MSU Student Organic Farm



Team Members (L to R)  
William Vanmaele  
Courtney Vanderhoof  
Linda Lay  
Caitlin Knedgen  
Alex Darrow



## Manufacturing Plant Energy Audit and Optimization - (4:20 pm)

Perrigo Holland wants to contribute to the corporate goal of reducing energy consumption by 15% by the year 2020. The Energy Pharmers performed an energy audit to evaluate the facility's energy profile and recommended energy conservation measures that will offset the impact of the new addition on overall energy consumption.



**Faculty Advisor**  
Aluel Go



**Faculty Advisor**  
Truman Surbrook

**Sponsor**  
Perrigo  
(under Non-disclosure)



Team Members (L to R)  
Nicholas Servadio  
Emily Willis  
Kara Dean  
Alexandra Whitman



# Team Projects

## Red Swamp Crayfish Control in Michigan - (4:30 pm)

Red Swamp Crayfish, *Procambarus clarkii*, are an invasive species in Michigan and the Michigan Department of Natural Resources (MDNR) has found invasive *P. clarkii*, in ponds and lakes of Southern, Michigan. The crayfish are a cause of concern for the environment and are a threat to the surrounding infrastructure due to their burrowing methods. The team was tasked to design and implement a technically and economically feasible solution to control the invasive species, Red Swamp Crayfish, from a retention pond in Novi, MI, to prevent further environmental and economic degradation.



**Faculty Advisor**  
Wei Liao, PE

**Sponsor**  
MDNR



**Team Members (L to R)**  
Alexis Kontorousis  
Xin Tang  
Bolun Li  
Elizabeth Ausmus





## Biosystems Engineering 2018 Distinguished Alumni Award

### **James (Jim) Borsum**

James (Jim) Borsum received his B.S. in 1980 and his M.S. in 1981 in Food Engineering and his MBA in Finance and Marketing from University of Chicago. Jim is Partnership Leader, Global Supply Chain & Shared Services for World Vision International. Jim is recognized for world-class operations management expertise in fast-paced human capital intensive professional services businesses, and as a forerunner in the evolution of contemporary strategic sourcing and global supply chain management practices. Jim is highly effective in team building, people development and motivation, creating enabling environments where people are innovative, performance-driven and excel.

At MSU, Jim graduated in the first Food Engineering cohort and continued with Dr. Bakker-Arkema for a Master's degree while interning with Kellogg. Upon graduation in 1981, Jim joined CPC International as an Operations Manager / Superintendent / Process Control Engineer. In 1986, he joined RHM, PLC to become Vice President & General Manager / Plant Manager for New Tech Snacks. Most notable in his career he worked as a Management Consultant for almost 25 years with A.T. Kearney as Managing Director and Operations Practice Leader, focusing on Consumer Products, Retail and Manufacturing clients. In addition Jim also spent time with The Boston Consulting Group and KPMG as Operations Strategy Practice Leader.

Jim and wife Deborah live in Burr Ridge, IL. In recent years, they have been very active (investors and on Board/counsel) with the Great African Food Company where they expect to spend a lot of their time going forward. Congratulations Jim for making BE proud! Go Green!



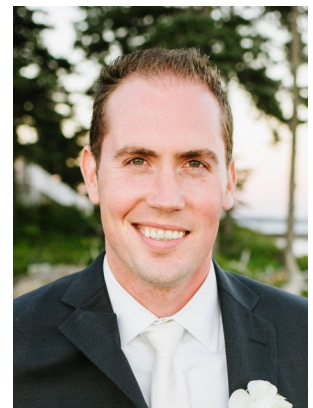
## Biosystems Engineering 2018 Outstanding Alumni Award

### **James (Jim) MacLellan**

James (Jim) MacLellan received his B.S. in 2011 and his M.S. in 2012 in Biosystems Engineering. Jim is Senior Research Engineer, Global R & D Product Development, for Beam Suntory. He is a senior leader responsible for whiskey quality initiatives, specifically for Jim Beam Bourbon, along with helping to drive Beam's portfolio growth strategy.

During most of his time at MSU, Jim worked very closely with Dr. Liao and his research group investigating energy production from traditional agricultural waste streams and creating more value-added byproducts from anaerobic digestion technology. Upon graduation, he started as a research technician in Louisville, KY, within the R&D organization at Beam Global (now Beam Suntory) helping to support new alcoholic beverage innovations. Jim was fortunate to move up within the organization as a research engineer that supported implementation strategies of new products into our various facilities across the globe with specific tours to India and Japan. His career path then took a turn as a research engineer at SC Johnson in Racine, WI, where he supported the growth of new home cleaning products and was a lead in new technology evaluation to help streamline manufacturing processes. He returned to Beam Suntory approximately a year ago.

Jim and wife Julie, married in a small Maine wedding in 2016, are expecting their first daughter in September. They have two amazing retriever dogs, Peyton and Harbor, and now reside in their new home just outside of Louisville, KY. They hope to make it back to East Lansing more often so their daughter can start to experience such an amazing place. Go Green!



# Industry Advisory Board 2017-2018

**Kevin Blue (Chair)** is Director, Manufacturing Engineering with Meijer<sup>®</sup>. Meijer<sup>®</sup> is a family-owned company that began during the Great Depression when Hendrik Meijer, and his 14-year-old son, Fred, fulfilled a need in the community. Together, they evolved the small grocery store into a one-stop shopping experience for customers. Meijer<sup>®</sup> employs 65,000 team members in six states. Kevin holds a B.S. in Engineering, a M.S. in Engineering Management and is working on a M.Sc. in Business.

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**Holly Bowers** is Executive Director of Geospatial and Gas Asset Management at Consumers Energy. Holly is responsible for the engineering, system improvements, enhancements, and integrity for over 27,000 miles of distribution lines and 2,467 miles of transmission pipelines that serve 1.6 million customers in Michigan. Holly holds a B.S. in Biosystems Engineering and a MBA in Business Administration.

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**Lisa Buchholz** is Global Leader of Analytical Regulatory Sciences with Dow AgroSciences<sup>®</sup>. Dow AgroSciences<sup>®</sup> LLC, based in Indianapolis, Indiana, USA, is a global leader in providing pest management and biotechnology products that improve the quality and quantity of the earth's food supply and contribute to the health and quality of life of the world's growing population. Lisa holds a B.S. in Biological Sciences.

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**Matthew Burt** is Assistant Director Clinical Quality Assurance with AbbVie<sup>®</sup>. AbbVie's 29,000 employees are scientists, researchers, communicators, manufacturing specialists and regulatory experts located around the globe. Matt holds a B.S. in Biosystems Engineering and a MBA.

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**Shelley Crawford** is Group Engineering Manager for Global Pringles<sup>®</sup> and Pop-tarts<sup>®</sup> at Kellogg<sup>®</sup> Company, the world's leading producer of cereal and a leading producer of convenience foods. Shelly holds a B.S. in Biosystems Engineering and a MBA in Marketing.

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**Michelle Crook, PE**, is Senior Project Engineer for the Michigan Department of Natural Resources. She provides engineering project management and oversight for DNR projects. Michelle holds a B.S. in Environmental Engineering.

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**Cassandra Edwards** is Production Manager for Bimbo Bakeries<sup>®</sup>, USA in Beaverton, OR. Prior to Bimbo Bakeries<sup>®</sup>, she was the Research and Development Manager at ConAgra Foods<sup>®</sup>. Cassandra holds a B.S. in Food Engineering and a M.S. in Mechanical Engineering.

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**Gene Ford** is Vice President R&D, Head of PTC Fremont, at Nestlé Nutrition<sup>®</sup> in Fremont, Michigan. He has more than 25 years of experience in domestic and international product development, manufacturing, logistics, and sales within the consumer food industry. Gene holds B.S. and M.S. degrees in Agricultural Engineering and an Executive M.S. degree.

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**Jeremy Hoeh, PE**, is Environmental Health Programs Unit Supervisor in the Department of Environmental Quality (DEQ) Drinking Water and Municipal Assistance Division. He has a broad range of education and experience across DEQ programs. Jeremy holds a B.S. in Chemical Engineering.

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**Eric Iversen, PE**, is Senior Project Manager with LSG Engineers and Surveyors in Lansing, MI. Eric is well versed in local and state regulatory agency procedures regarding site planning, permitting, SRF public financing, floodplain and wetland permits, storm water management and treatment, ground and surface water discharge permits, sanitary sewers, water, onsite wastewater (drainfields), wastewater lagoons and well systems, etc. including the standards and requirements of MDOT, MDEQ, MDTMB, and MDLARA. Eric holds a B.S. in Civil Engineering.

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**Ashley Julien, PE**, is an Environmental Engineer in the Michigan Department of Agriculture and Rural Development Environmental Stewardship Division. She supports the MAEAP program with determining appropriate solutions for engineering challenges including wastewater management, manure and fuel storage, and chemical safety. Ashley holds a B.S. in Civil Engineering and M.S. in Biosystems Engineering.

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**Andrew Knowles (Past Chair)** is Stein & Freezer Applications/Sales Support Manager at JBT FoodTech<sup>®</sup>, a leading supplier of integrated food processing solutions. Andrew holds a B.S. in Biosystems Engineering and a M.S. in Applied Statistics.

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# Industry Advisory Board 2017-2018

**Kevin Kowalk**, PE, (MI and WI), is a Project Manager and Senior Engineer for Water and Natural Resources and Site Characterization and Remediation Divisions for EA Engineering, Science and Technology, Inc., PLC. Kevin holds B.S. and M.S. degrees in Biosystems Engineering.

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**Jeffrey Mathews**, PhD, is the R &D Director for PepsiCo® Beverages. Pepsi® Beverages Company (PBC) handles approximately 75 percent of PepsiCo's North America beverage volume. Its diverse portfolio includes some of the world's most widely recognized beverage brands, including Pepsi®, Mountain Dew®, Sierra Mist®, Aquafina®, Gatorade®, SoBe®, Lipton®, and Amp Energy®. Jeffrey holds B.Sc., M.Sc. and Ph.D. degrees in Chemical Engineering/Paper Science and Engineering.

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**Mitch Miller** is the Senior Processing System Engineer for the General Mills-Yoplait® Plant, Reed City, Michigan. General Mills is among the world's largest food companies with U.S. shoppers on average placing at least one General Mills® product into their shopping cart each time they visit the grocery store. Mitch holds B.S. and M.S. degrees in Agricultural & Biosystems Engineering.

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**Chad Volkmann** is Site Leader and Manager – Chemistry Operations for Covance® Food Solutions in Battle Creek, MI. Chad manages the chemistry operations and is responsible for a 44,000 ft<sup>2</sup> laboratory that conducts nutritional chemistry testing for food and supplement clients. Chad holds a B.A. in Biology.

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**Eric Van Middendorp** is a Biomedical Engineer at Spectrum Health Innovations where he leads the design and development of FDA Class I and II medical devices. Eric works with the 25,000+ physicians and staff members across the Spectrum Health system to drive development of healthcare products and technologies. Eric holds a B.S. Product Design and Manufacturing Engineering and a M.S. in Mechanical Engineering.

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**Kirk Walter** is Senior Operations Director at Perrigo® Company PLC, a leading global healthcare supplier that develops, manufactures and distributes over-the-counter (OTC) and prescription (Rx) pharmaceuticals, nutritional products, and active pharmaceutical ingredients (API). Kirk holds a B.S. degree in Manufacturing Administration and a M.S. in Business Administration.

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**Richard (Rick) Woodford**, PE, is State Conservation Engineer for USDA-Natural Resources Conservation Service. He provides technical assistance in the field of soil and water conservation, implements NRCS' engineering policy and procedures for establishing technical engineering standards throughout Michigan. Rick holds B.S. and M.S. degrees in Civil Engineering.

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**Rob Yoder**, CFPS, (Chair-Elect) is Southeast Region Fluid Power Specialist for BDI®, Inc. a large industrial Distribution Company based in Cleveland, OH. Rob provides Fluid Power technical solutions to BDI® customers, and Fluid Power product sales support to all local branch sales personnel in the southeast region of the U.S. Rob holds a B.S. degree in Agricultural Engineering Technology.

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## Ex-officio

**Hannah Brodhead**, Undergraduate Advisor, Biosystems & Agricultural Engineering

**Darrell W. Donahue**, PE, Professor and Chair, Biosystems & Agricultural Engineering

**Gina Masell Haylett**, Graduate Student Representative

**Ron Hendrick**, Dean, College of Agriculture and Natural Resources

**Leo Kempel**, Dean, College of Engineering

**Monika Michalik**, Undergraduate Student Representative

**Luke Reese**, Industry Liaison, Biosystems & Agricultural Engineering

**Larry Walker**, CANR Alumni Association

**Vacant**, ASABE Section Representative

## Industry Evaluators

**Dylan Comer**, JBT FoodTech

**Dave Cotton**, MDEQ

**Laura Doud**, MDARD

**Denae Friedheim**, MSU Student Organic Farm

**Eric Gordon**, Covance Laboratories, Inc.

**Adrian Harrell**, Kellogg

**John Heiser**, Perrigo

**Seth Herbst**, MDNR

**Louis Nelson**, Kellogg

**Brian Roth**, MSU Dept. of Fisheries and Wildlife

**Brittany Tomlin**, Kellogg

**Steve Urda**, MDOT

**Jim Vinoski**, Meijer

# Scholarship Descriptions

## Undergraduate Scholarships

### F. W. Bakker-Arkema Endowed

F.W. Bakker-Arkema was a professor of Agricultural Engineering at MSU for over 30 years. His scholarship recognizes students that contribute to the cultural and intellectual diversity of Biosystems Engineering through their leadership experiences.

### DeBoer Family

The DeBoer Family scholarship is awarded to students that excel academically while demonstrating a passion for Biosystems Engineering.

### A.W. Farrall

The Farrall Scholarship, named in honor of A.W. “Doc” Farrall, is the most prestigious undergraduate scholarship awarded by the department. Dr. Farrall chaired the department during its pivotal years from 1945 -1964, which included establishment of the first Agricultural Engineering Ph.D. program in the nation. Farrall Scholars have excelled both academically and professionally, demonstrating leadership within Biosystems Engineering.

### Clarence and Thelma Hansen

The Clarence and Thelma Hansen scholarship is awarded to Michigan natives and U.S. students who have demonstrated academic achievement, leadership, and experience working in agriculture.

### George E. and Betty L. Merva Endowed

Dr. George Merva was a faculty member in the department for 30 years. This endowment, named in his and his wife’s honor, recognizes upperclassman who have demonstrated leadership and academic success.

### John and Julianna Merva Endowed

Dr. George Merva’s father, John, was an immigrant from Slovakia, who, despite of receiving no formal schooling and working full time in ore mines, was able to teach himself three languages. In this spirit the John and Julianna Merva Scholarship is awarded to an undergraduate student who has balanced leadership and academic success while also working to cover their educational expenses.

### Howard F. and Esther L. McColly

The Howard F. and Esther L. McColly Scholarship honors Dr. Howard McColly who served on the faculty of the Department of Agricultural Engineering for more than 21 years and his wife, Esther. The scholarship is awarded to students who have demonstrated academic achievement, leadership, and service to the profession.

### Michigan ASABE Section Scholarship

One award for a freshman and one for a sophomore student registered as an Agricultural Engineering or Biological Systems Engineering student at a University or College. The student must be a registered as a Pre-Professional member of the American Society of Agricultural and Biological Engineers, ASABE.

# Scholarship Descriptions

## Freshman Scholarships

### Robert J. Gustafson

The Gustafson scholarship is awarded to students with a high academic ability and/or financial need with a first preference for incoming freshman students.

### Alfred & Mary Murray

The Murray scholarship is awarded to students with a high academic ability and/or financial need with a first preference for incoming freshman students.

## Graduate Scholarships

### Outstanding BE Research Fellowship & Fitch H. Beach Award

Presented to one of the top PhD students in the BE graduate program who has excelled in research productivity and who's work suggests a high-level of direct impact on society. Awardee presents at the college level against similar nominees in other College of Engineering disciplines. Funding is based on placement in the competition at the college level and is funded by the College of Engineering and the BAE Endowment for Graduate Studies.

### Most Outstanding BE Graduate Student Fellowship

Presented to top students in the Biosystems Engineering (BE) graduate program to recognize their breadth of excellence and direct and indirect contributions to the Biosystems and Ag. Engineering (BAE) Department through professional productivity, service to the department and university, and contributions to the extended community. Funded by the BAE Endowment for Graduate Studies established and funded by past and current BAE faculty and other donors wishing to support graduate education.

### Galen & Ann Brown

To support graduate students working in the domain of engineering related or applied to the fruit and/or vegetable industries; a field to which Dr. Galen Brown dedicated his career to provide many improvements and advancements. Funded by the family of Galen and Ann Brown and others who respected and/or worked with Galen.

### Merle & Catherine Esmay

To support international graduate students with a clear passion and plan to return to their home country to implement their knowledge gained through their MSU BAE degree. Funded by the family of Merle and Catherine Esmay and others who have the passion, as did Merle, to make a difference around the globe.

# 2018-2019 Scholarship Recipients

## Undergraduate Awards

### ***F.W. Bakker-Arkema Endowed Scholarship***

*Emma Dester  
Kieron Moller  
Nama Naseem  
Anna Raschke*

### ***DeBoer Family Scholarship/Fellowship Fund***

*Natalie Coaster  
Lindsey DeFrain  
Jacob Duckworth  
Carly Gomez  
Linnea Riddell  
Katelyn Skornia  
Aryn Thomas*

### ***A.W. Farrall Scholarship***

*Jessica Hauda*

### ***Clarence & Thelma Hansen Scholarship***

*Tyler VanBuren  
Christopher Wentworth  
Alicia Ziegler*

### ***Howard & Esther McColly Scholarship***

*Douglas Clements  
Rachelle Crow  
Miriam Kaburu*

### ***George E. and Betty L. Merva Endowed Scholarship***

*Leah Allen*

### ***John & Julianna Merva Undergraduate Excellence Fund***

*Kiran Lantrip*

### ***Michigan ASABE Section Scholarship***

*Rachelle Crow*

## Graduate Awards

### ***Biosystems Engineering and College of Engineering Outstanding Graduate Student Fellowship***

*Yuzhen Lu*

### ***Outstanding BE Research Fellowship & Fitch H. Beach Award***

*Matthew Herman*

### ***Galen & Ann Brown Scholarship***

*Yuzhen Lu  
Kaitlyn Casulli*

### ***Merle & Catherine Esmay Scholarship***

*Alexandre Chabrelie  
Khang Huynh  
Juan Pablo Rojas-Sossa  
Juan Sebastian Hernandez Suarez  
Vinni Thekkudan*

## 2017-2018 Freshman Awards

### ***Alfred and Mary Murray Scholarship***

*Emily Dettloff  
Rachel Shapin  
Matthew Smith  
Christopher Wentworth*

### ***Robert J. Gustafson Scholarship***

*Emma Dester  
Jack Salerno*



*"Spring"  
A.W. Farrall Hall*

# Showcase Sponsor



Thank you to John Bean Technologies (JBT) Corporation, a leading supplier of integrated food processing solutions, for support of a 2017/18 Senior Design project and the BE Showcase. From single machines to complete processing lines, the JBT FoodTech division enhances value and captures quality, nutrition and taste in food products.

The JBT FoodTech offering includes:

- Freezer solutions for the freezing and chilling of meat, seafood, poultry, ready-to-eat meals, fruit, vegetable and bakery products
- Protein-processing solutions that portion, coat and cook poultry, meat, seafood, vegetable and bakery products
- Shelf-stable sterilization solutions for fruits, vegetables, soups, sauces, dairy and pet food products, as well as ready-to-eat meals in a wide variety of modern packages
- Fruit and juice processing solutions that extract, concentrate and aseptically process citrus, tomato and other fruits

For more information, visit the JBT FoodTech website at: <http://www.jbtfoodtech.com/>

Biosystems & Agricultural Engineering  
524 S. Shaw Lane, Room 216  
East Lansing, MI 48824  
517-355-4720  
[www.egr.msu.edu/bae](http://www.egr.msu.edu/bae)

College of Agriculture and Natural Resources  
[www.canr.msu.edu](http://www.canr.msu.edu)

College of Engineering  
[www.egr.msu.edu](http://www.egr.msu.edu)

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

# Dinner Program

Welcome  
Mr. Jonathan Althouse  
Dinner

Distinguished and Outstanding Alumni Awards  
Presentation by Dr. Darrell W. Donahue

Mr. James (Jim) Borsum (BS, FE, 1980; MS, FE, 1981)  
Mr. James (Jim) MacLellan (BS, BE, 2011; MS, BE, 2012)

Graduate Scholarship Awards  
Dr. Darrell W. Donahue

Undergraduate Scholarship Awards  
Dr. Darrell W. Donahue

Recognition of Senior Design Students  
Dr. Dana Kirk  
Dr. Luke Reese

Closing Remarks  
Dr. Darrell W. Donahue