Biological Systems Engineering
UNIVERSITY OF WISCONSIN–MADISON

BSE Update

BSE Fast Facts

As of this fall semester, total enrollment in Biological Systems Engineering is 166 students, with the following breakdown in specializations:

Specialization	Undergraduates
Food & Bioprocessing	45
Machinery Systems	61
Structural Systems	8
Natural Resources	21
Undeclared	49

There are also currently 46 graduate students in the department.

The Biological Systems Engineering Department would like to extend a warm welcome back to all of our students, and an extra special welcome to our 16 freshmen students, as well as the 22 new students who transferred in from different departments!

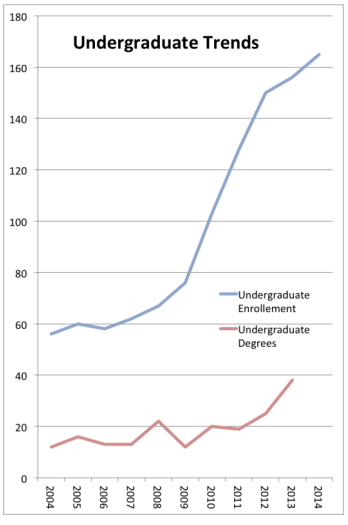
Read about the 2014 Quarter Scale Tractor Team on page 3.

In this issue

News from the Department Chair - Doug Reinemann

Greetings to Alumni and friends of the Biological Systems Engineering Department. We have just completed a 10-year review of our program for the college and campus. A lot has been happening in the department in the past decade and I am happy to report that the Biological Systems Engineering program is thriving.

Undergraduate enrollment is at an all-time high with continued growth projected into the future. We have become one of the largest of the applied agriculture departments in the college as indicted by number of degrees granted by program.



Continued on page 5.

STUDENT UPDATE

American Society of Agricultural and Biological Engineers WI Student Chapter

Update by President Charlotte Keleske

The UW-Madison ASABE Student Chapter had an exciting 2014 spring semester.

This past semester started with a group of four students attending the Midwest Regional Rally. This year the rally was held at the Ohio State University in Columbus, Ohio. Six different student chapters joined together for a weekend that included technical tours, ASABE meetings, and a variety of social events.

During the spring 2014 ASABE Wisconsin Section meeting two UW-Madison students were recognized. Brenna Stow was awarded the Biological Systems Engineering Student of the Year Award and Zong Liu was awarded the Biological Systems Engineering Graduate Student of the Year Award.

This semester a number of ASABE students volunteered at the UW-Madison CALS Day for Kids. This was an opportunity for college students to educate young kids about science. Kids were given demonstrations that taught them about the production of ethanol, wastewater treatment, and ultra-absorbent soil.

Throughout the spring semester the UW-Madison ASABE Student Chapter had a few social events. These events included laser tagging in Madison, attending a class on how to fix your bike, and attending a Brewers game in Milwaukee.

The end of the semester wrapped up with a cookout and a farewell to all the graduating seniors.

This coming fall we are planning a camping trip, the annual Lawn Mower Clinic, and multiple industry tours.

ASABE Officers of 2014

President — Charlotte Keleske

Vice President — Brenna Stow

Secretary — April Zhao

Treasurer — Tim O'Brien

Polygon — Reid Christ

CALS — Josiah Zanghi

AEM — Bobby Lee

Public Relations/Webmaster — Jenna Sanford & Zong Liu

Lawn Mower Clinic — Thomas Larson, Cyrus Nigon, Brian Straub

2014 WI ASABE Student Award Recipients

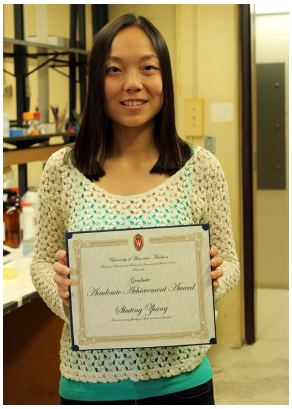
Brenna Stow - Biological Systems Engineering Student of the Year Award

Zong Liu - Biological Systems Engineering Graduate Student of the Year Award

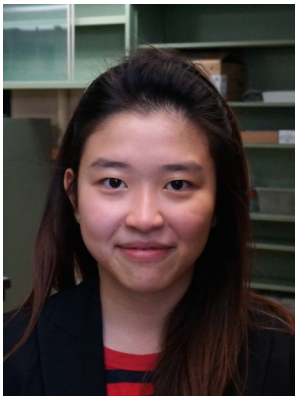
A ROUND OF APPLAUSE FOR OUR AWARD WINNERS!

Shuting Zhang (MS student) and Dr. Chang Geun Yoo (postdoc) won the poster competition award at WARF Discovery Challenge Research Symposium. Only 4 posters of 65 were recognized.

Yi-Cheng Wang—Recipient of the Feeding Tomorrow Graduate Scholarship from Institute of Food Technologists & recipient of the WARF Discovery Challenge Award.



Shuting Zhang—Academic Achievement Award for International Graduate Students.



Undergrad Shu-Ching Yang—Recipient of the SIRE-REU5 (Sustainability in Research and Education—Research Experience for Undergraduates) Award.

QUARTER SCALE TRACTOR TEAM

As another school years starts, so does a new tractor design for Badger Pulling. Hoping to rebound from last year's ultimate failure of not completing the tractor, this year we are pushing to win the competition. There are many new doors opening for the team that we hope will lead to bright, new things and ultimately make us a household name at the International Quarter Scale Competition.

Last year's A-team attempted to deal with some untimely hiccups, but couldn't overcome the challenge. Entering last school year, the team was looking forward to helping design a tractor with senior design. In the end, that fell through, and the team had to design a tractor. Getting such a late start on the design proved to be the limiting factor in not completing the A-team tractor. A hard push near the end of the semester really brought the tractor to a workable prototype, but the end of the semester came too quick.

Cyrus Nigon led the X-team design. With the help of Justin Orrick, who designed the X-team tractor as an A-Team tractor, Cyrus went through the driveline, looking for areas of improvement. He took the power shift apart looking for where clutch slip might possibly be happening and also revised some linkages and other various components. The brakes were also in need of improvement. At the 2013 competition, the brake test proved to be a problem. New mounting locations for brake systems components were designed and mounted to the tractor. At competition, the team had some issues again with the brake. Using brake parts from UW-Platteville and a little ingenuity, the team fixed the brakes and was able to compete. The team finished in 9th place.

For the 2014-2015 team, there are many new changes happening. The first is the introduction of our new advisor, Brian Luck. He has previous competition experience while he was in school both at University of Kentucky and Mississippi State. A new meeting format has also been implemented. At the beginning of each night, the entire team meets not only to talk about happenings within the organization, but also to talk about the design of the tractor. A big change for this year is a major rule change from the national committee. Every four years, a major rule change occurs, and this year it included the introduction of a new durability course. This durability course is a 250ft oval track that has 80ft of rough bumps and 80ft of sand. Eight laps must be completed in less than 12 minutes. This course will take the place of one of the four pulls. Badger Pulling is looking forward to a great year!

CALS Departmental Scholarships 2014-2015

Don S. Montgomery Scholarship

Joshua Bartlet, Food & Bioprocess, Cross Plains, WI

Joshua Mcafee, Machinery Systems, Omro, WI

Cyrus Nigon, Machinery Systems, Greenwood, WI

Justin Wendorf, Machinery Systems, Viola, WI

Josiah Zanghi, Food & Bioprocess, Beaver Dam, WI

Ervin W. Schroeder Biological Systems Engineering Scholarship

Brenna Stow, Natural Resource & Environmental, Saline, MN

Lindsay Shewchuk, Food & Bioprocess, Inger Grove Heights, MN

Gail Edwin and Janice Faye Janssen Biological Systems Engineering Fund

Scott Franke, Food & Bioprocess, New Berlin, WI

Ham Bruhn Biological Systems Engineering Scholarship

Ian Atkins, Food & Bioprocess, Bayfield, WI

Laruen Saleh, Food & Bioprocess, Amery, WI

Michael Shinners, Structural Systems, Antigo, WI

Lynndon and Norma Brooks Scholarship

Jennifer Sandford, Food & Bioprocess, Oregon, WI

Trevor Solie, Natural Resources & Environment, Victoria, MN

Orrin I. Berge Scholarship

Reid Christ, Machinery Systems, Independence, WI

Robert H. & Willa Meier Scholarship Fund

Jacob Hrebik, Machinery Systems, Mosinee, WI

Laura Kramer, General Option, Cochrane, WI

Roger W. Ambrose Scholarship

April Zhao, Food & Bioprocess, Eagan, MN

Wisconsin Agricultural Engineer Scholarship

Jenna Walsh, Natural Resource & Environment, Madison, WI

Wisconsin Biological Systems Engineering Scholarship

Katherine Scharenbroch, Food & Bioprocess, Sheboygan, WI

Travis Schumacher, Food & Bioprocess, Marathon, WI

Dick J. & Grace B. Stith Scholarship Fund

Jonathan Kett, Food & Bioprocess, Burr Ridge, IL

Xingtai Li, Food & Bioprocess, China

News From the Chair (continued from page 1)

We attribute this growth to our relevance in meeting the grand challenges at the intersection of population growth, quality food supply and, environmental quality, combined with our reputation of high-quality, personalized instruction and the success of job placement for our students. The hallmarks of our program are:

- An emphasis on holistic, systems approach to solving problems.
- Cross-disciplinary integration of engineering, agriculture and biology.
- Applied research that seeks to answer important near-term questions.

Large Enrollment 'service' Courses	Students
367 Renewable Energy Systems	169
356 Sustainable Residential Constr	65
BSE Core Courses **(Bold = w/ lab)**	
365 Meas. & Instr. Biological Syst	**58**
364 Food & Biological Materials	**55**
409 Career Management	54
309 Design Practicum1	54
349 Quant Biological Systems	48
249 Engr Princ. Biological Systems	43
509 Design Practicum 11	**39**

The success of our undergraduate program is great news but has stressed our instructional capacity, especially for our lab courses.

Our graduate instruction and research programs are also thriving with major growth in research grants and associated graduate student numbers in the department since our last program review. Our Extension program is highly regarded in the UWEX system. While the number of Extension faculty FTEs have declined in the past 10 years, our Extension faculty have responded by developing alternate sources of funding for our extension and outreach efforts.

Our faculty and staff enjoy a productive and collegial atmosphere, as indicated by a recent department climate survey. We are faced with budgetary challenges in the next biennium and are looking for ways to maintain the high level of scholarly activity and high quality of undergraduate and graduate instruction and extension and outreach for which we are known. The support of our alumni and friends is becoming increasingly important to help us meet these challenges. This support includes internship opportunities for our undergraduates, advising student groups for senior design projects, and donations to undergraduate and graduate student scholarships. If you have questions about supporting the department in one of these ways please let me know and have a look at the donation portfolio at the end of this newsletter. A special note of thanks goes to all who have provided support in the past.

- Doug Reinemann

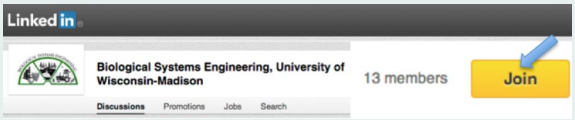
BSE Gets Connected!

Join the BSE LinkedIn group!

We have created a LinkedIn group for the University of Wisconsin Biological Systems Engineering department to:

1. Facilitate professional networking among BSE family and friends.
2. Maintain contacts with UW-BSE Alumni.
3. Post internships and permanent positions for current and former students
4. Provide profile pages of the BSE alumni and thereby inform current students about diverse career tracks.
5. Invite employers to list jobs and search for potential candidates.

Several former and current students have made contacts, set up interviews and eventually received job offers as a result of posting LinkedIn profiles. If you have already created a LinkedIn profile make sure you 'Join' to become a part of the BSE LinkedIn network.



If you have not yet created a profile, now is the time to get Linked Up!

BSE Faculty & Alumni Honors

FACULTY UPDATE

2014 WI ASABE Awards

Robert Pofahl—2014 Career Achievement Award Recipient. The purpose of this award is to honor a Wisconsin Section member who has made outstanding contributions to Agricultural and Biological Engineering through work in research, education, design, and/or extension. The selection is based on the candidate's lifetime accomplishments as an engineer.

Congratulations to Scott Sanford for being selected as the recipient for the Wayne G. Russell Award. The purpose of this award is to recognize an individual or organization demonstrating exceptional commitment to helping the Wisconsin agricultural industry adopt new electric technology, farmstead mechanization, and farm equipment. He has done an outstanding job at establishing a strong extension program in agricultural energy management working on projects funded by USDA's 2014 Wisconsin Section ASABE Awards Natural Resource Conservation Service, the Sustainable Agriculture Research and Education (SARE) program and other public and private agencies.

BSE Alumnus Amanda Crowe—2014 Young Engineer Award Recipient for her outstanding contributions to the advancement of the Agricultural and Biological Systems Engineering profession.

Dr. Junyong (J.Y.) Zhu , recently was honored with US Forest Service R&D Deputy Chief's Distinguished Science Award, which recognizes a US Forest Service scientist for his sustained research productivity and excellence and the impact of his research work.

Congratulations to David Kammel for receiving the 2014 Pound Extension Award for his work focusing on Dairy Modernization that has helped countless Wisconsin dairyman.

Xuejun (Jun) Pan accepts the Faculty and Staff award at the 2014 International Student Graduation Celebration. This award recognizes individuals who have gone above and beyond the call of duty to provide assistance and support to international students on campus.

BSE Retirements

Happy retirement to Dr. Richard Muck! Richard retired from the UW at then end of September 2014 after many years. In 2011, Richard received the Career Achievement Award from Wisconsin ASABE. He spent much of his time at the US Dairy Forage Research Center where his fields of interest included silage quality, management, and silage-environment interactions.

NEW FACULTY PROFILE: BRIAN LUCK

Brian Luck joined CALS on January 1 as an assistant professor in the Department of Biological Systems Engineering and a UW-Extension precision agriculture specialist.

Briefly describe your career path—up to this point.

Both my undergraduate and M.S. degrees were completed at the University of Kentucky in the Biosystems and Agricultural Engineering (BAE) Department where I specialized in the area of machine systems automation. My undergraduate and graduate research focused primarily on developing agricultural sprayer technology that provided variable rate application capability while reducing application errors. While pursuing my M.S. degree I accepted an engineer associate position within the BAE Department as manager and lead engineer for a bulk food transport security system development project. I completed both my M.S. work and bulk food security project in December of 2009. I then relocated to pursue my Ph.D. at Mississippi State University in the Agricultural and Biological Engineering Department. My research focused on characterizing air velocity distribution within commercial broiler production facilities.

What is the main focus of your research program?

My extension program and research will be directed toward agricultural machinery and precision agriculture issues. Machine management, variable rate technology, agricultural "big data" management, and remote sensing are some of my specific areas of interest. My applied research program will be developed based on the needs of stakeholders within the state.

What drew you to UW-Madison?

When I made the decision to complete my terminating degree my goal was to obtain a faculty position with an extension/research split focusing on machine systems and precision agriculture. My pursuit of this goal led me to UW-Madison. While gathering information about the state and the university, I found that Wisconsin has very diverse agriculture production within the state and one of the best extension programs in the country. I am excited to work with faculty, students, county agents and stakeholders to solve precision agriculture and machinery related issues.

What do you like to do outside of work?

In my free time I enjoy being outdoors (camping, fishing, etc.). One thing I am looking forward to trying in Wisconsin is snowmobiling.

TAKE SAFETY ALONG CAMPAIGN AWARDED SCHOLARSHIP

A team of UW-Extension farm safety specialists have won the Donald R. Peterson Technology Transfer scholarship. The announcement was made during the spring luncheon of the Wisconsin Farm Technology Days, Inc. board of directors meeting.

John Shutske, WFTD Board Chair and the new interim provost and vice chancellor of UW-Extension, presented the $1,000 scholarship check to Cheryl Skjolass - one of the extension team members. Jeff Nelson, another extension staff member focusing on farm safety, and third year student, Jenna Sanford, completed the trio. The message shared by the extension staff at the 2013 Barron County FTD was "Farm to Field - Take Safety Along."

The award is provided annually to a CALS faculty or academic staff member or team for outstanding effectiveness in improving public understanding of new technological advancements; new management tools, processes, or concepts; or contemporary agriculture and natural resources issues via an exhibit (display, presentation, or demonstration) at Wisconsin Farm Technology Days. The intent of the Award is to broadly encourage CALS faculty and staff to design creative ways to convey research-based information from CALS to its agricultural and natural resources constituents.

KIFLE GEBREMEDHIN

As a professor of agricultural and biological engineering at Cornell University for more than three decades, Kifle Gebremedhin MS'75 PhD'78 is in a prime position to offer young people advice about the field. His contributions have been wide-ranging, particularly in the areas of animal thermal stress physiology and design of post-frame buildings. Two of his findings have become the basis for national standards set by the American Society of Agricultural and Biological Engineers.

But Gebremedhin is in a good position to offer life lessons as well. He recently visited the CALS campus to give two technical presentations—and one, for BSE students, that served to inspire. His talk, titled "Be the Best You Can Be," emphasized hard work, persistence and flexibility—values that have served him well through many challenges.

Gebremedhin grew up on a family farm in Eritrea, a small country in the Horn of Africa. Although he was gifted academically, his parents could only afford to send him to a vocational high school rather than a university prep school because it offered room and board. That put him on track for a diploma program rather than a more prestigious degree program in college, which he attended in Ethiopia. An uncle who had earlier settled in Wisconsin helped him relocate and eventually attend the University of Wisconsin–Platteville, where he earned a B.S. in civil engineering. For graduate study at UW-Madison, however, he was able to get financial support only if he switched to agricultural engineering—a field for which he developed a great passion.

What made you fall in love with biological systems engineering?

It was through my research. I was working with animals in the Biotron [a controlled environment facility for biological research]. I raised three calves from their first week to eight weeks of age inside a chamber I'd built, measuring how much heat they produced. It was from that relationship that I came to love biological systems—the interface between the biological object and the engineering becomes very interesting. I'm still working on thermal stress physiology of animals.

You have some pretty funny stories about your first day in Wisconsin.

I came here in January. I had no idea about snow. The only thing I knew was hail. When I was leaving the plane, the flight attendant said, "You can't go out like that. It's cold outside. Why don't you take a blanket and throw it around you?" I said, "Don't worry." When I got out, it was so cold, I went back to get the blanket. The flight attendant said, "I told you so."

How does it feel to be back here?

So many firsts happened to me in Wisconsin. My first experience with snow, I got married here, my first child was born here, I got my first degree at UW–Platteville, my master's and Ph.D. at UW–Madison, and I started my academic career here. So this is my second home. I have a fond relationship with Wisconsin.

Your talk for students emphasizes global challenges (adequate food, water and energy supplies, clean air, soil health, etc.). Why?

I want them to think globally—and to think about how biological systems engineers can help meet those challenges, from the smallest to the largest ecological systems.

This Q&A was originally published in the Summer 2014 issue of Grow magazine.

ALUMNI UPDATE

BSE GET'S CONNECTED!

"LIKE" BSE ON FACEBOOK

Find us on Facebook at UW-Madison Department of Biological Systems Engineering and stay updated on BSE activities, awards, presentations, and news stories!

www.facebook.comUWMadisonBSE

NATHAN RYAN

After receiving his B.S. in BSE with a machinery emphasis in 2004, Nathan Ryan took a design engineering position with the Gehl Company, where he inherited the Windrow Merger Project. Ryan later transitioned into designing new products such as asphalt pavers and skid steer loaders, while outside of work he enrolled part time in the UW-Milwaukee School of Business, pursuing an MBA with a focus on Managing Innovation and New Products. In 2008, after Manitou acquired Gehl Company, Ryan accepted a new title as project engineer. In 2010, to test his skillset as an engineer, Ryan took the PE exam and received his mechanical engineering PE Credentials. In 2012, Ryan was able to combine the business knowledge he had acquired through his MBA program with his product knowledge when he accepted a position within Manitou as Global Product Manager for Wheel Loader and Excavators. Outside of work Ryan married fellow UW-Madison alumna, Kathryn, and just this past January they welcomed their first baby, Ellison.

We want to feature YOU in the next BSE Update!

Email your update to bse@wisc.edu

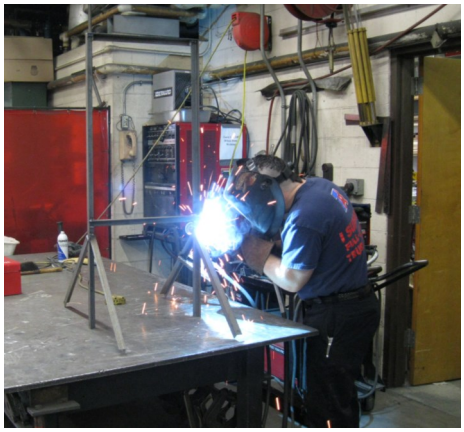
Or send it in to BSE Update 460 Henry Mall, Madison, WI 53706

Please include your degree(s), date(s), and any news to share!

KARL R. KLINGELLHOFER

Karl R Klingellhofer graduated in 1948 with a BS in Agriculture with a major in Soil and Water Agricultural Engineering. In 1947, he served as President of the Student Chapter of ASAE. After graduation, Karl spent 33 years in the U.S. Department of Agriculture and ended up in Washington DC as Chief of the Watershed Planning Division. Klingellhofer then volunteered in Costa Rica and the Island of Rotatan. Afterwards, he was associated with a private engineering firm on a full time and then part-time basis for 15 years. Today, Karl is 87. He enjoys playing tennis, traveling, and flying airplanes, since he obtained his first pilot's license at age 86. Karl visited the campus in 2012, where he was given a personal tour by Professor Straub, which he greatly enjoyed! Karl still enjoys reading letters he wrote to his wife while he was enrolled here. One of his favorite quotes from the letter is about getting ready for the engineering banquet, "I am getting my Agricultural Engineering banquet lined up and we are going to have filet mignon for $2/plate."

Burkhardt Fund Update



The BSE department was the recipient of a gift from an Alum, Martin Burkhardt (MS Agricultural Engineering, 1964) and his wife Kathleen (BS Home Economics, 1960) to establish a fund to employ students to work in our shop and labs to round out their educational experience as well as help with the cost of an education. We have had a number of students that have benefitted from this generous gift over the past 15 years. In the past year, Trevor Meyer, Phil Pakes, and Chase Walters were the Burkhardt scholars. The three worked full time this past summer. The students were instrumental in completing many projects, both small and large. Trevor reported that his favorite part was being exposed to the many different graduate projects that were being worked on; of the projects, his favorite was a hazelnut sorter he was able to work on the last few weeks of summer. Phil really enjoyed being able to work with all of the great people – professors, grad students, and other student help. He was able to work on many different projects and enjoyed them each in their own way.

Contributors to BSE from October 2013—September 2014

Nathaniel & Caroline Altfeather
Eliot Bergeland
Gary & Sandra Bubenzer
Martin Burkhardt
Thomas Casey
Dennis Catterson
ConocoPhillips
Marshall Finner
Jonathan Gross
Gary Hoerth
Richard & Barbara Holloway
Brian Holmes
Jill Huenick
John Deere Foundation
John Deere World Headquarters
Karl Klingelhofer
Timothy Koch
Kristopher Krause
Jeffery Krebs
Madison K Kiwanis Club
MT Apartments
Gene Nimmer
John OConnor
Daniel Pederson
James Peterson
William Pick
John Ramsden
James Rauwerdink
Douglas & Mary Kay Reinemann
Brett Renk
Phillip Risser
Maralyn Saleh
David Schirer
Ronald Schuler
Richard Straub
Wisconsin Farm Technology Days
Mark Waldvogel
Patrick Walsh
Gregory Weber
Brandon Welsh

Thank You, Donors!

FUNDING UPDATE

PLEASE GIVE SOME CONSIDERATION IN CONTRIBUTING TO ONE OF THE BSE FUNDS LISTED BELOW:

Biological Systems Engineering Fund

Biological Systems Engineering Student Activities Fund

Biological Systems Engineering Student Scholarship Fund

Biological Systems Engineering Sense of Community Fund*

*The purpose of this fund is to establish and reaffirm a sense of community among the faculty, staff and students of the Department. Uses can include, but are not limited to, receptions and entertainment or costs associated with meals and refreshments. This includes functions related to retirements (excluding retirement gifts), welcome receptions, and any other occasion that the Chair considers to be team or morale building in nature or that allows the Department to function as a productive community."

We sincerely wish to thank our alumni and friends who have generously supported the College of Agricultural and Life Sciences Department of Biological Systems Engineering. Your gifts today are more important than ever as the University faces challenging budget constraints. Gifts made to the Department of Biological Systems Engineering help us with scholarship, facilities improvement, endowed professorship and graduate fellowships, and carry on our tradition as leaders and innovators in the Biological Systems Engineering field.

An invitation to join the prestigious Bascom Hill Society is extended to those who provide support of $50,000 or more to the department or to a specific project or program of their choice. You can pledge your commitment over a 10-year period, provide for a gift in your will, or give a gift of annuities or appreciated stock. If you have specific questions about giving, please contact Barbara McCarthy at the UW Foundation (Phone: 608-265-5891; e-mail: barb.mccarthy@supportuw.org).

Department of Biological Systems Engineering Funds

Two options to make a gift:

1.Visit the BSE website at **bse.wisc.edu** and select "**Support BSE**" in the left column.

2.Make checks payable to University of Wisconsin Foundation and return this form to:

University of Wisconsin Foundation
US Bank Lockbox
PO Box 78807
Milwaukee, WI 53278-0807

I/we would like to join other alumni and friends in support of the Department of Biological Systems Engineering.

I/we wish to pledge $_____ over _____ years. Please remind me of my pledge in _____ (month).

I/we contribute $_____. (Contribution is enclosed.) My company will match this gift; company form enclosed.

I/we wish to have my contribution support _____ fund.

Name:_____ E-Mail:_____

Address:_____

City: _____ State: _____ Zip:_____

Please charge my gift of $ _____ to my: MasterCard Visa American Express

Card number ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____Expiration date _____

Cardholder's name as it appears on credit card (please print):_____

Cardholder's Signature:_____ Date _____

The **Share the Wonderful** campaign is an annual effort to raise funds to support the university's core budget in order to bring students an exceptional educational experience. To learn more and make a donation, please visit www.sharethewonderful.org. If you would like to make a gift to the department, please mention BSE to ensure the funds are properly directed. If you are donating online, please write "Biological Systems Engineering" under "other designation."

Thank you for your support.

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Biological Systems Engineering
UNIVERSITY OF WISCONSIN–MADISON