

# SYSTEMS

Spring 2003

Published by Department of Industrial and Manufacturing Systems Engineering

## Modules prep students for real-time industry challenges

**Z**eroing in on a problem is often a matter of sifting through voluminous data before a solution opens up. In fact, stresses Assistant Professor **Sigurdur Olafsson**, "when you are solving real engineering problems, you may spend almost 80% of your time searching for correct data, and then an equal amount of time cleaning it up before you actually begin to formulate and solve the problem."

A \$100,000 National Science Foundation research grant is allowing Olafsson to bring elements of some of the "messiness" of industry problems into the classroom. His objective is to have undergraduate engineers experience the realities of large-scale industry problem solving while they absorb and learn to apply fundamental concepts.

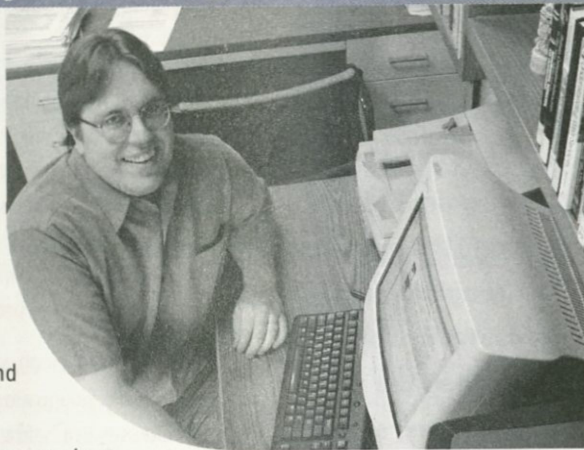
Olafsson heads a team of five faculty and five students from both the colleges of engineering and education in this interdisciplinary project. The team is developing learning modules for basic undergraduate courses. Students learn to identify and formulate problems as well as apply problem-specific information technology tools for a host of industry operations and management-related issues.

"The idea is to give students an opportunity to explore multiple means to solving a single problem using a range of different tools," says Olafsson. Companies value analytical skills that go beyond the pale of traditional engineering problem-solving approaches, adds Olafsson, which is something the modules are designed to achieve. Conversely, students stand to gain from an early introduction to using information technology tools, giving them an edge as they enter the job market.

Ultimately, explains Olafsson, the goal is to produce a set of interrelated active learning modules requiring an increased use of databases that cuts across all IMSE undergraduate courses. Students will be presented with real scenario problems provided by industry that require them to extract, analyze, and compare data from multiple sources.

The first module was implemented in the spring semester and has generated enthusiastic response, reports Olafsson. "Students liked being able to tackle a very realistic problem and to be able to pull together all the knowledge they have acquired in individual courses." The final plan calls for several modules that will encompass all required core courses.

Olafsson and colleagues are working closely with the IMSE's industry advisory council in identifying challenging problems and setting attainable goals for students. The Cargill software donation will form an integral part of modules relevant to manufacturing execution systems.



## Cargill gift promotes learning

Last fall semester Cargill Incorporated, Minneapolis, donated its Manufacturing Execution System (MES) enterprise software to the department. Designed specifically for industry use, the software has been uniquely modified by faculty to meet student instructional needs. Students use the MES software to examine and provide input to multiple aspects of an industrial operation. This learning activity is integrated within course content and faculty-developed modules.

"The software simulates the workings of a mini-company," explains IMSE Chair **Pat Patterson**. "While students make decisions at one level, they come to understand how their choices impact successive stages in an operation." The MES program helps faculty reinforce the idea that industry units are interdependent and that sharing information is critical to the overall success of a company.

On an instructional level, "the MES software is conducive to setting up open-ended problems where knowledge from one course necessarily feeds into another," says Patterson. Students are making the connection between courses and understanding how fundamental concepts find applications across a continuum of practical problems.

The Cargill gift when combined with faculty-designed learning modules makes for "a unique program in the industrial engineering curriculum at large," he states. "This type of learning goes beyond textbook engineering problem solving because our students are applying knowledge to real data using advanced data analysis tools."



## First PIE recipient honored

**Robert E. Walkup**, Mayor of Tucson, Arizona, became the first to receive the Prominence in Industrial Engineering (PIE) award, established last year in honor of his father **Joseph K. Walkup**.

Walkup Senior was instrumental in creating ISU's industrial engineering department in 1942 and, as department head, guided its growth for the next 31 years.

The PIE award recognizes outstanding achievements by ISU alumni in the industrial engineering profession. Robert Walkup (BSIE'60) worked for 35 years as an engineer and executive at Rockwell International, Fairchild Republic, and Hughes Aircraft Company.

As senior executive at Hughes, he helped bring 6,000 high-tech jobs to Tucson. He also contributed to the creation of Tucson's economic strategy plan and served as chairman of the Arizona Space Commission, which he helped to establish.

The award was presented to Mayor Walkup on behalf of his family during IMSE's annual awards and recognition banquet held April 24, 2003. Three generations of Walkups have graduated in industrial engineering from Iowa State University.

*Nominations for the PIE award can be sent to Lynn Franco, IMSE Department, 2019 Black Engineering, ISU, Ames, IA 50011-2164.*

*E-mail: mlfranco@iastate.edu.*

## Dual degree master's program produces first graduates

Thirty-one professional engineers graduated last fall semester from the Executive Engineer Dual Master's Degree Program, offered by Iowa State University and the University of Iowa. These students earned a master of engineering in systems engineering (M.E.S.E.) from ISU and a master of business administration (M.B.A.) from Iowa.

The agreement between ISU's College of Engineering and the UI's Henry B. Tippie School of Management to develop and offer the dual degree program was prompted by the request of executives at Rockwell Collins, a global leader in aviation electronics and communications headquartered in Cedar Rapids.

**"We knew the Executive M.B.A. program at Iowa and ISU's systems engineering master's program provided the basic elements, so we proposed the dual program."**

"With around 2,700 engineers at Rockwell Collins, our need for high-level technical leadership that understands both the business side of the equation and the technology side is very important," said Martin Cutter, manager, engineering resource management, at Rockwell Collins. "We knew the Executive M.B.A. program at Iowa and ISU's systems engineering master's program provided the basic elements, so we proposed the dual program."

Launched in October 2000, the program is set up in executive format with the students taking classes as a group and working on projects in teams. Classes are held twice a week, with regular study group meetings. The program also includes a week in residence at both Iowa State and Iowa, along with a ten-day trip abroad. An undergraduate degree in engineering is a prerequisite for the program.

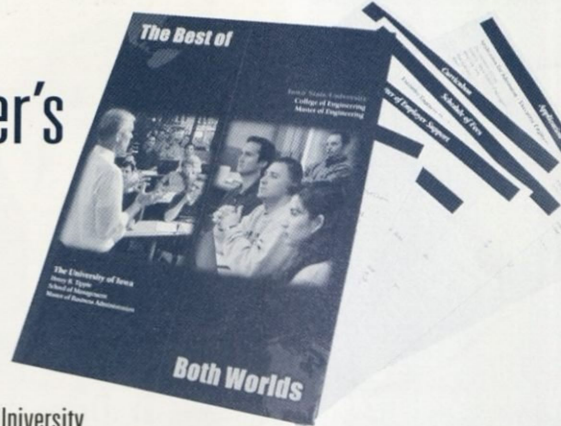
"I think one of the most valuable aspects of the program is that our faculty is able to interact with students who bring practical engineering experience to the classroom. The discussions from this setup can be very different than those to which we are accustomed," says **Doug Gemmill**, IMSE associate professor and director of ISU's systems engineering graduate program.

Participants have found the program worthwhile for many reasons. The blend of business and engineering, they say, has helped them better understand ways to create and finance business plans. Additionally, networking with international companies was also cited as another benefit as well as just learning the 'language' of business that helps engineers contribute to important marketing decisions.

## IE alum wins PACE award

**Vernon Schatz** was the recipient of the College of Engineering's Professional Achievement Citation in Engineering (PACE) award for 2002. Schatz's contribution marks an essential feature of personal and business finances today. He developed and patented the "smart card," which opened the door for computerized electronic funds transfers or EFTs.

After graduating from Iowa State with an industrial engineering degree in 1949, Schatz earned an M.B.A. at Xavier University. He has worked for IBM, General Electric, and the Jewell companies. He left Jewell to set up a subsidiary of the First National Bank of Chicago to market EFTs to other banks. Schatz received the 2001 Computer Pioneer Award from the IEEE Computer Society for outstanding contributions in the computing profession. He currently resides in Lake Bluff, Illinois.



# IMSE faculty is 'on call' and ready to serve

Teacher, mentor, and researcher **Frank Peters** is also a volunteer firefighter and emergency medical technician—a hobby that has been a part of his life from an early age. His father, four brothers, and a sister had all volunteered in the Pennsylvania community of Harborcreek. It was only natural, then, that Peters followed in the family footsteps. He joined the fire department at 14 and began going on calls when he was 16.

Throughout high school and the first two years of college at the Penn State Erie campus, Peters balanced studies with volunteering. While he devoted his time exclusively to studying during his undergraduate days at State College, the desire to serve resurfaced full strength during his graduate studies. The Alpha Community Ambulance Service included both volunteers and career professionals. Peters was back doing what he loved, handling over 300 calls annually.

Being an EMT and firefighter means helping people by doing your job. "You come up to an accident, you grasp what needs to be done, and you do it," he explains. "You notice details like, 'Is the gasoline tank intact?' But when it's over, you go away and don't even know what color or make the car was."

"We have exactly the same training as the career personnel; we are professional volunteers," he emphasizes. The initial EMT training is 130 hours, with an additional 72 hours required every two years for continued certification. Firefighting also requires an equivalent amount of training.

Peters, who lives in Ankeny with his wife (also an EMT) and children, volunteers his time to the community there. The unit gets about 600 fire calls and 1,100 EMS calls per year. Peters attends to 20–30 calls a month, in addition to, of course, his teaching and research commitments in manufacturing processes, manufacturing systems, and information systems for manufacturing.



## Teaching excellence

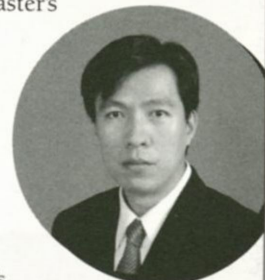
Two IMSE faculty were named recipients of the Iowa State University Teaching Excellence Award, presented to the top 10% of ISU graduate students whose teaching, as evaluated by their academic departments, is outstanding.

**Justin Anderson** has worked as a T.A. for three semesters, teaching undergraduate lab courses. He has also worked with faculty on developing new procedures and techniques that strengthen student learning. Anderson expects to complete his master's degree in December 2003.



Anderson

**Pongchai Athikomrattanakul** completed his Ph.D. degree in Fall 2002. He is currently the chair of the logistics management program at King Mongkut's University of Technology Thonburi in Bangkok, Thailand.



Athikomrattanakul

## Barta retires



Tom Barta (left) and IMSE Emeritus Professor Jean Hempstead, who will turn 99 this August.

IMSE Professor **Tom Barta** is retiring this year after 34 years of teaching, mentoring, research, and departmental service at Iowa State. Barta has taught courses on manufacturing and production systems simulation, design of modeling tools, and artificial intelligence applications. Barta's research areas included simulation graphics software, an expert system that helped housing discrimination investigators, and intelligent vehicle highway systems. He is a member of the Institute of Industrial Engineers, the Society for Computer Simulation, the Institute of Electrical and Electronics Engineers, the American Society for Engineering Education, and the American Association for Artificial Intelligence.

## In Memoriam



*Keith L. McRoberts*  
IE Emeritus Professor and former IE department chair **Keith L. McRoberts** passed away in July of 2002. He received his bachelor's, master's and doctorate degrees from Iowa State's industrial engineering department. He was a Fellow of the Institute of Industrial Engineers and an active ABET evaluator. A lifetime member and Alumni Medal recipient of the ISU Alumni Association, McRoberts belonged to the Knights of St. Patrick and Order of the Knoll at ISU. He retired from ISU in 1989.

*Art Kleinschmidt*

**Art Kleinschmidt** joined the IE department in 1961, where he taught courses in work measurement, management accounting, and safety. He retired in 1976. Kleinschmidt passed away on June 25, 2002.

IN MEMORIAM

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# Keeping our future as strong as our pa

Donors are encouraged to participate in the Investing in People initiative by making endowment gifts or expendable (non-endowment) gifts. Minimum funding levels for the Investing in People initiative are listed at right.

Endowed undergraduate scholarship.....	\$	25,000
Expendable undergraduate scholarship.....	\$	1,500
Endowed graduate fellowship.....	\$	150,000
Endowed partial graduate fellowship.....	\$	80,000

## Leaders of the pack today, leaders of the world tomorrow

**The IIE regional conference came to ISU this spring semester, and the students did the department proud!**

The 2003 IIE Regional Conference was held from February 27 to March 2 in Des Moines and featured the participation of 250 students and faculty from 19 schools in seven states and Mexico. Hosted by the IE department and organized by the IIE student planning committee with IMSE's **Lynn Franco** as staff advisor and **Frank Peters** as faculty advisor, the conference offered an exciting range of intellectual, educational, and entertainment experiences. It included

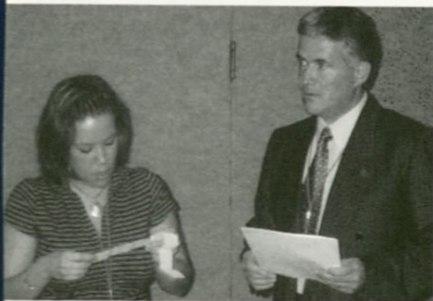
- eight workshops on diverse professional paths in virtual reality, law, consulting, and entrepreneurship
- ten industry tours
- a student technical paper competition
- social events for participants

**"We believe that industrial engineers are truly 'Leaders of the Pack!'"**

Keynote speaker **Rudolf J. Herrmann (BSIE'73)**, president and CEO (retired) of Dover Resources, Inc., of Tulsa, Oklahoma, shared his views on new challenges facing IE professionals in the future. Herrmann's sustained leadership activities and involvement in higher education issues over the years aptly complemented the theme of this year's conference: celebrating industrial engineers as innovative professionals, whose talents guide and shape the world.

The milestone event was not lost on IE senior **Jeffrey Matthias**. "We felt really proud and honored to have hosted the IIE regional conference this year," he said. "The conference planning committee did a great job and put in a lot of hard work for the past year to ensure that the conference was the best ever!"

There was something for everyone, added Matthias, including new activities that he hopes will serve as a benchmark for future conferences. "We believe that industrial engineers are truly 'Leaders of the Pack!'"



*IIE Regional Conference Planning Committee members: Front row from left—Meghan Moore, Jenn Tapke, Becky Marsh, Kira Hendricks, Justin Griffith, Nichole Harrington; Back row from left—Casey Waechter, Jeffrey Matthias, Anne Selene, Josh Anderson, Adam Crepeau. Not pictured—Joel Meehan and Josh Sieck.*

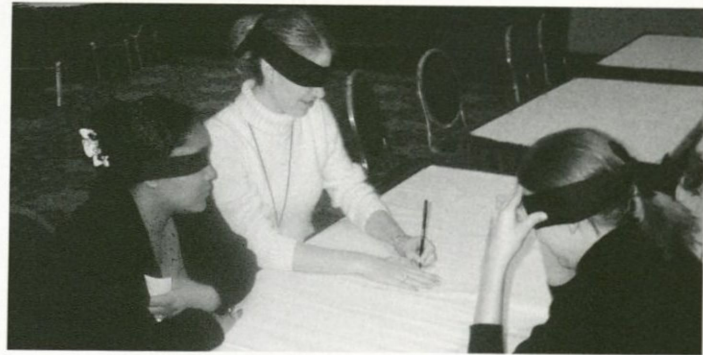
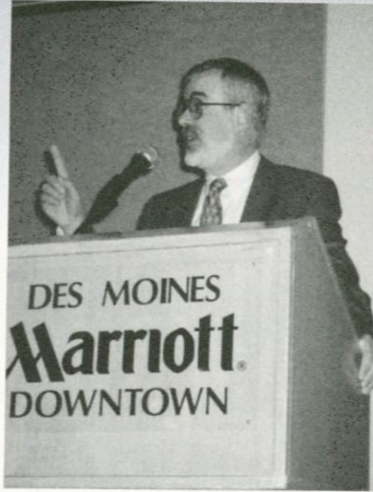


# st — how to invest in the people of IMSE

Expendable graduate fellowship.....	\$ 5,000
Endowed department head chair.....	\$ 2,000,000
Endowed chair.....	\$ 1,500,000
Endowed professorship.....	\$ 500,000

Endowed visiting professorship.....	\$ 250,000
Endowed faculty fellowship.....	\$ 150,000
Expendable faculty fellowship.....	\$ 15,000

For more information, contact the ISU Foundation at 515-294-4607 or visit [www.foundation.iastate.edu](http://www.foundation.iastate.edu). See next page for gift designations.



**"The planning committee did a great job and put in a lot of hard work for the past year to ensure that the conference was the best ever!"**



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## New IMSE faculty member

**Matthew C. Frank** will be joining the IMSE faculty in Fall 2003. Frank's teaching and research areas include manufacturing processes, rapid prototyping, computer-assisted machining, and integrated product/process development.



Frank received his bachelor's and master's degrees in mechanical

engineering from Pennsylvania State University. In 2003, he completed his doctorate in industrial engineering from the same institution. Frank's current research focus is in the area of CNC machining in rapid prototyping processes.

## SYSTEMS

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Chair, IMSE  
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# Design course brings industry knowledge to classroom

**L**ennox Manufacturing in Marshalltown, Iowa, sponsored IE Instructor **Leslie Potter**'s senior design class last fall. Students began their projects by visiting the plant early in the semester and returned periodically for additional information and consultations with company officials and engineers. At semester's end, 10 groups of three or four students gave 35-minute presentations based on their research. Students received awards and recognition for their effort and work.



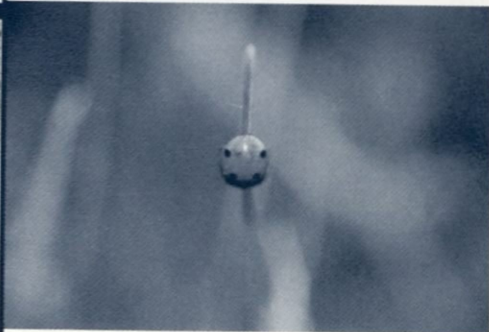
Each semester, a manufacturing company sponsors the department's senior design class. Industry interaction always has the potential to generate "a win-win situation" in the design classes, says Potter, because the projects often give students their first experience with industry practices. They learn to focus on cost-effective solutions without compromising worker safety. Companies, on the other hand, benefit from the breadth and intensity of research that students bring to the problem. "It's an excellent opportunity for all parties involved," says Potter.



## More than meets the eye

In her time away from teaching, **Leslie Potter**'s focus shifts to other matters. She is an accomplished photographer, who has converted her exquisite photo collection of gardens and nature into a small business that's getting big attention from area shop owners.

'Leslie's Garden' has found its way into several Iowa shops and countless homes in the form of hand-crafted and signed greeting cards or framed artwork. Photography has been a long-time hobby, Potter says, and when the piles of photos started collecting, she wanted to put them to good use. Potter's collection now includes about 300 images, with half the pictures captured around her Janesville home.



Potter received her bachelor's degree in industrial engineering at Iowa State, a master's degree from Penn State, and previously worked for John Deere. She enjoys the opportunity to observe nature up close—from dandelions and spiders to kernels of glistening corn and the serenity of the Iowa landscape. "It's mind-boggling that we walk past this everyday and hardly give it the time of day," she says.

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# We need your help!

Your support of the IMSE department is greatly appreciated.

When contacted by the ISU Foundation, please designate your gift or pledge to the Department of Industrial and Manufacturing Systems Engineering (Account #0513712) or to the Industrial and Manufacturing Systems Engineering Scholarship Fund (Account #0500079).

Your contributions help fund student facilities, lab equipment, faculty teaching and research, and department activities.

You can share information with the department by sending it to Lynn Franco at [mlfranco@iastate.edu](mailto:mlfranco@iastate.edu) or Industrial and Manufacturing Systems Engineering, 2019 Black Engineering, Iowa State University, Ames, IA 50011-2164.

Visit our Web site at [www.imse.iastate.edu](http://www.imse.iastate.edu) or contact us at (515) 294-1682; Fax (515) 294-3524; [imse@iastate.edu](mailto:imse@iastate.edu).

## 2002-2003 Donor List

IMSE is grateful to the following individuals for their support of the department. The continued generosity of friends and alumni helps to keep IMSE strong and is especially appreciated in a time of considerable cutbacks in state appropriations to the university.

- Michael Bahl
- Michael & Pat Banks
- Nicholas Berkholtz
- Stephen Berry
- James Boies
- Richard & Rochelle Brenner
- Benjamin & Allison Burnett
- Douglas Carlson
- Julie Chichlowski
- Elizabeth Collins
- Ann Cromwell
- Craig DiLorenzo
- Cynthia Donovan
- John Dunn
- Raymond Edlund
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- Ann and Michael Morrissey
- Burnell E. Nelsen
- Anthony Nurre
- Arlan Stavnheim
- Craig and Sara Vander Leest
- Terence Virtue
- Scott Wahl

## Faculty/staff honors and awards

The Dean's Staff Excellence Award this year went to IMSE staff member **Lynn Franco**. Franco has been an integral part of IMSE since 1981 when she joined as a secretary. She has been the lead secretary at IMSE since 1989. Franco is a Marston Club member and serves on several community boards.



IMSE Professor **Max Morris** received the Jerome Sacks Award from the National Institute of Statistical Sciences for cross-disciplinary research.

The Engineering Student Council named IMSE Associate Professor **Frank Peters** Outstanding Professor for 2002.

## Award Recipients

### Berger-David Prize, 2003

- |                    |                  |
|--------------------|------------------|
| Nichole Harrington | Kira Hendricks   |
| Brian Jensen       | Jeffrey Matthias |

### IE 361 Excellence in Quality Poster Presentation

- |                    |                    |
|--------------------|--------------------|
| <b>Spring 2002</b> | <b>Fall 2002</b>   |
| Nichole Harrington | Daniel Bumblauskas |
| Kira Hendricks     | Kyan Heck          |
| Brian Jensen       | Casey Kann         |
| Jeffrey Matthias   | Asem Patnaik       |

### IE 441 Design Project

(with Lennox Industries Inc. in Marshalltown, Iowa)

- |                    |                  |
|--------------------|------------------|
| <b>Spring 2002</b> | <b>Fall 2002</b> |
| Valerie Demean     | David Gustafson  |
| Shawn Higbee       | Brian Jensen     |
| Tara Moses         | Paul Kenkel      |
| Candice Rosenow    | Justin Woods     |

## IMSE Scholarship Recipients 2003-2004

- |  |   |
|--|---|
| Clarence Ford  | Kelly Ruff  |
| Claude & Christina Summers                             | Jeanne Boutott  |
| Clayton H. Cooper                                      | Casey Kann  |
| Deere and Company                                      | Johannah Tripp-Rieks<br>Matthew Marek   |
| Don Grant Incentive Award                              | Teniece Hardy   |
| Donald Kaser   | Kyan Heck   |
| Engineer's Week  | Breann Force<br>Spencer Geisler<br>Ryan Howard<br>Jennifer Husted<br>Kimberly Knuth<br>Andrew Malin<br>Trenton Norman<br>Stephanic Smith<br>Maryellen Upton<br>Derek Watson                     |
| George W. Catt   | Nicole Richardson   |
| Geraldine M. Montag Scholar                            | Eric Kosch<br>Stephan Zalesky   |
| Guy W. Morrison  | Jason Thomas  |
| Harold Jacob Reihman                                   | Scott Post<br>Michael Rodgers   |
| Hempstead-Walkup                                       | Meghan Moore  |
| IIE Central Iowa Chapter                               | Brad Bishop   |
| IMSE General Scholarship                               | Brad Bishop<br>Daniel Brown<br>Teniece Hardy<br>Charles Larsen<br>Paula Madgett<br>Ryan McDermott<br>Nicole Richardson<br>Brenden Root<br>Lindsay Sickels<br>Jessica Stahler<br>Heidi Stuhlfaut |
| John and Mary Pappajohn Scholarship                    | Casey Kann<br>Eric Kosch  |
| Keith L. and Helen F. McRoberts Health Care            | Jessica Stahler   |
| Lane Wells   | Brenden Root  |
| Nelson Brothers  | Melissa Baetke  |
| Paul E. Morgan   | Louise Johnson  |
| Roderick Seward, Flossie Ratcliffe & Helen M. Galloway | Travis Etzel<br>Jeffrey Matthias  |
| Walter J. Lyons Memorial                               | Charles Larsen  |
| Webster Manufacturing                                  | Daniel Brown  |

# IOWA STATE UNIVERSITY

Department of Industrial and Manufacturing Systems Engineering  
College of Engineering  
2019 Black Engineering  
Iowa State University  
Ames, Iowa 50011-2164

## Markets, pyramids, caves, . . . and conference planning

Last fall semester, 16 IE undergraduates took in Mexico's sites and sounds while they attended the Industrial and Systems Engineering Congress in Toluca, one of 30 campuses of the "Instituto Tecnológico y de Estudios Superiores de Monterrey" (ITESM)—Mexico's leading engineering institution. The international conference offered a plethora of experiences for IE undergrads.

For starters, this exclusively student-run event held valuable lessons for IE students in the art of conference planning.

Senior **Jeffrey Matthias**, who coordinated IIE's regional conference in Des Moines this spring, returned with useful tips on ways to handle transportation, publicity, and scheduling for large-scale events. He also brought back vivid memories of Mexican fiestas, markets, pyramids, and caves.

IE Senior **Anne Selene** enjoyed meeting industrial engineers from another country. "I also bonded with my fellow IEs from Iowa State in our experiences in Mexico," something that held the group in good stead during planning sessions back home.

The Toluca conference is one of many ways the department engages students in international experiences, states IMSE Chair **Pat Patterson**, who accompanied the group.

"The objective was to get students into another culture, expose them to leaders in the field, and provide opportunities for them to interact with their international counterparts," Patterson said. This was the fourth year that IE students have traveled abroad for professional conferences.

This spring semester four students from the Toluca campus visited the IMSE department. For eight days, they experienced life and academics in another culture.

