

# IMSE NEWS

## Industrial and Manufacturing Systems Engineering

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### The Chairman's Corner



Pius J. Egbelu  
Professor & Chair

It is a pleasure to have the opportunity to update the alumni and friends of the department on events that took place in the past year and plans for the year to come. More than any other time in the past, this year is especially important as it marks the beginning of a new millennium that carries with it both opportunities and challenges. For the IMSE department, the new millennium also means a new home. The long-awaited move to Black Engineering Building is targeted for January 2000. That month will also mark the demolition of Engineering Annex and the groundbreaking for ETRC (Engineering Teaching and Research Complex) Phase II. This past year was a particularly busy one in the department because of two major activities—namely, the redesign of the undergraduate curriculum, which I will address later, and the planning for the move to Black. At this moment, all is set for the move as we wait for the bell to toll. Since the move will take place in the middle of the academic year, our greatest challenge is to ensure minimum disruption of classes and research programs during the spring semester.

Our undergraduate curriculum was completely redesigned to better reflect the needs of industry today and in the decade to come. The new curriculum requires a total of 123.5 semester hours for graduation compared to 138.5 in the earlier catalogs of recent years. A set of stated ABET and departmental program objectives and input from industry guided the design of the new curriculum. We regard the new curriculum as a living document that is constantly under review in the spirit of continuous improvement. The new curriculum is

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### ISU Professor Sets Game Schedules with Computer Program

*(Reprinted with permission from Diane Heldt and The Tribune.)*

Iowa State University professor Tim Van Voorhis is a sports fan but with a new baby in the family, he doesn't get out to Iowa State games as often as he'd like.

Starting with the fall of 2000 football season, Van Voorhis should try a bit harder.

After all, he is the man responsible for the schedule.

Van Voorhis last fall offered his services to the Big 12 Conference and helped officials set up football schedules for the 2000 through 2003 seasons. Those schedules were released this week. Now Van Voorhis is helping conference officials construct basketball schedules.

"I'm a big sports fan, so it's been real fun to get a behind-the-scenes look at how they determine the schedule," he said.

Van Voorhis, an assistant professor of industrial and manufacturing systems engineering, often talks about sports in his classes. Last year, a graduate student brought Van Voorhis an academic journal article about two university professors helping the SEC conference with its game scheduling.

"I thought it didn't look like anything too difficult—that I could do the same thing," he said.

So Van Voorhis contacted the Big 12 Conference and offered his help.

He wrote a computer program to generate all of the different schedules that would meet the requirements set forth by the conference—a task that had been done by hand in the past.

Some of the parameters specified by conference officials included keeping the Texas-Oklahoma game in early October; keeping the Colorado-Nebraska and Texas-Texas A&M games at the end of the season; making sure every team ends the season with one home and one road game; and making sure teams play no more than two consecutive road games.

"With this program, I put in the parameters, and it spits out schedules to meet those requirements," he said.

"Then they can just look at them and choose the one they like best."

Van Voorhis first came up with about 400 possible schedules with his computer program. Big 12 officials gave him a few more parameters to narrow those choices down, he said. Then Big 12 officials narrowed the choices to four for the athletic directors to examine.

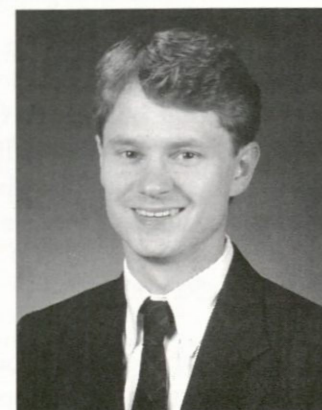
"You can just keep adding the requirements or criteria that you want, and it will come up with the schedules to fit that," he said.

Van Voorhis now is working with the Big 12 on basketball scheduling, which required him to write a different computer program. Basketball is more difficult than football to schedule, since the season is longer and the televised games vary more, he said.

"It's just like putting a big puzzle together," he said.

Van Voorhis hopes to work with other conferences on their schedules and maybe even refine his computer program for retail sale.

"It could work for high schools or colleges—anybody that's tired of doing scheduling by hand and wants something easier," he said. "It eliminates some of the tedious stuff for them so they can focus on the more interesting aspects of setting a schedule."



Van Voorhis

IOWA STATE UNIVERSITY



flexible and provides an undergraduate the opportunity to specialize if he or she chooses. In addition to the standard program that can be pursued by a student who does not want to specialize, the new curriculum provides for specialization in manufacturing, operations research, human factors engineering, and engineering management. The manufacturing engineering option allows students interested in pursuing a career in manufacturing to take more courses in that area. Students whose career interests are in operations research or management science have the opportunity to take additional courses in the area to further specialize in operations research. Similarly, students whose interests span both engineering and business can now structure their academic programs to reflect their interests by pursuing the engineering management option. The human factors engineering subspecialty is provided to meet the needs of a growing group of students whose career interests are in the health care and human factors field. In any case, the new curriculum requires that students should take courses in all four primary areas before they can specialize. We believe the new curriculum more properly accounts for the diverse interests reflected in the population of our students and in the field of industrial engineering.

We are proud of the new curriculum and would like to use this opportunity to specially thank the several alumni that provided valuable input to the process. My thanks also go to the members of the Industrial Advisory Council for their effort in working with both the department and the alumni population and sharing their companies' expectations for future industrial engineering graduates. We appreciate the growing involvement of the alumni in the affairs of the department. Last academic year, the department, in collaboration with the Industrial Advisory Council, commissioned a survey of the alumni to assess their attitudes toward interaction and acting as advocates for the department in various ways. The survey was sent to 1,000 alumni, which represents approximately 20% of the living graduates of the department. Some of you reading this column probably received the survey. Nearly 50% of the survey recipients responded by returning their survey. This return rate alone clearly points out the overwhelming interest and good will the alumni have toward the department. Typically, the return rate of surveys is much lower than the 50% mark.

Analysis of the survey data yielded some spectacular results. Of those who responded, more than half identified specific ways they would like to interact and support the department. Some of the ways specified included (a) adoption of undergraduates as mentors, (b)

making recruiting visits to local high schools on behalf of the IMSE department, (c) creation of co-op/internship positions in alums' own companies for IMSE students, (d) availability to serve on the Industrial Advisory Council of the department if invited, (e) donation of equipment in support of laboratory development, (f) supporting the department fund-raising effort through donations, and many others. We are absolutely delighted with all the prospects and I would like to thank all of you for your good will. The department is stronger when we all work together as a team. For those of you still considering how best to get involved, we would like to encourage you by saying that any degree of involvement aimed at enhancing the department is better than no involvement at all. Come and join us as we march into the new millenium. We are currently putting a plan in place regarding how to get in touch with all those who volunteered in the survey to help in one way or another. If you are one of those and you have not heard from us since you responded, be patient with us; we will definitely get in touch with you.

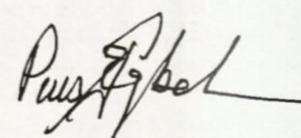
IMSE faculty and staff continue to engage in a host of activities both at the professional and university levels. At the professional level, IMSE faculty serve as proposal reviewers for funding agencies and program chairs of conferences. They present technical papers and serve as session chairs at professional meeting/conferences. They serve on organizing and program committees of major conferences. Their services are also sought on the editorial boards of major journals in the field of industrial engineering and related disciplines. For example, Drs. Steve Vardeman, Pius Egbelu, John Jackman, and Jo Min all serve on the editorial boards of one or more journals, including such journals as *IIE Transactions*, *Technometrics*, *Journal of Manufacturing Systems*, *Journal of Operations and Quantitative Management*, and *American Statistician*. The faculty is also engaged in funded research with government and private institutions. The Department of Energy, the National Science Foundation, and the Department of Defense are examples of federal agencies that are supporting research in the department. John Deere, Sauer-Sundstrand, Rockwell, and Midwest Power are four companies currently collaborating on research with the department. Prospects for future collaborations are improving.

At the university level, IMSE faculty are quite visible in the services they provide. They serve on committees at all levels of the university, college, and department. They organize workshops, teach distance education classes, provide technical assistance to Iowa companies, and support the university athletic programs through their

expertise. Because of the various ways industrial engineering education can be used, there does not seem to be a dull moment for the department.

IMSE graduates are highly sought after and are enjoying a high rate of employment. The department and the College of Engineering as a whole are on the target list of many companies for recruiting. We do not seem to produce enough graduates to satisfy their demand. Many employers cite the quality undergraduate program, good work ethics, and practical experience gained by our students through co-op/internship programs as their reasons for recruiting graduates from the IMSE department. The department strongly encourages all students to participate in co-op/internship programs before graduation. Such experiences are found to enhance students' learning and their appreciation of the profession. The students are also very active in professional organizations. They attend regional and national meetings and participate in paper contests. Currently, five professional societies are represented in the department. These are Institute of Industrial Engineers (IIE), Society of Manufacturing Engineers (SME), Institute for Operations Research and Management Science (INFORMS), American Society of Quality (ASQ), and Health Information Management Systems Society (HIMSS). Students from these organizations have proven very valuable to the department in their effort to serve as mentors for new students and representatives of the department at high school recruiting events.

There is much more news to share about the department than I can adequately address in this column. We invite you to visit with us if you are in Ames or the surrounding areas. This will give you the opportunity to meet with the students, staff, and faculty, some of whom joined the department perhaps after your graduation. Whether you have met some of the faculty members and staff before or not, it will not take much time to develop a bond with them because they share a common goal with you in advancing the quality of education provided by the department. Even if you cannot visit in person, keeping in touch with the department has never been easier. Contact us through the department web page—that address is <http://www.imse.iastate.edu/>. We even have a chat room where you can enter into discussions with other alumni on some issues of interest. As always, we remain tuned to hear from our core constituents and that includes you.



## '99 Spring Awards Banquet

The IMSE department's annual spring awards banquet was held on April 22 at the Iowa State Center Scheman Building. Students, faculty, and guests enjoyed a buffet dinner followed by a program recognizing scholarship winners and presenting special awards for faculty and staff. Twenty-two students were awarded scholarships totaling \$24,000.

The keynote speaker for the evening was Keith Jessen, who was visiting the IMSE department as their Executive-in-Residence for the week.

Keith is the director of facilities services for the Collins Rockwell business of the Rockwell Corporation. He received his bachelor of science from Iowa State in the IE department in 1971 and earned his masters in industrial engineering in 1978. Keith spoke about his life-long career at Rockwell and his journey as an industrial engineer.



Keith Jessen (L), keynote speaker, and Pius Egbelu (R)



## Welcome to our New Faculty and Staff

Kim Vo joined the IMSE staff as an administrative specialist in October of 1998. She came from the Center for Nondestructive Evaluation at Iowa State University, where she had worked for ten years. She received her B.B.A. in accounting from Iowa State University in December 1989. Vo has brought to this job some valuable work experience on matters related to institutional fiscal management and procedures. We welcome her to the IMSE team.



Kim Vo

Kevin Brownfield joined our department in July 1998 as a senior machinist. Prior to that, he worked for the college's Engineering Research Institute for 18 years. Kevin works with faculty and graduate students to build special tooling and prototypes to support the department's research efforts. Kevin also brings his wealth of practical knowledge to the undergraduate manufacturing processes laboratories. He assists the lab instructors and provides the students with another perspective on the topics. Mr. Brownfield is truly enhancing the quality of the department's research and undergraduate laboratories. Join us in welcoming Kevin to the IMSE team.



Kevin Brownfield

Sarah Ryan joined the IMSE faculty as an associate professor in August, 1999. She received her B.S. in systems engineering from The University of Virginia in 1983 and her M.S.E. and Ph.D. in industrial and operations engineering from The University of Michigan in 1984 and 1988, respectively. From 1988 to 1990 she was an assistant professor of industrial engineering at the University of Pittsburgh. After a career hiatus spent on family, consulting, and part-time teaching, she returned to academia full time in 1995 as an assistant professor of industrial engineering at the University of Nebraska.



Sarah Ryan

Her research work has focused on probabilistic models for estimation and planning of electric power and manufacturing systems. She is also interested in optimization problems over time. The object is to choose a sequence of decisions in which previous choices affect the possible options for the current decision. In 1997 she received a Faculty Early Career Development (CAREER) Award from the National Science Foundation, a four-year grant to study how to use forecast information effectively in rolling decision problems such as capacity expansion and inventory planning.

Ryan has taught a wide variety of operations research and statistics courses at all levels, with a particular focus on stochastic models and network optimization. As part of her NSF award, she is developing classroom activities to encourage cognitive processing. Student projects and theses completed under her supervision concern forecasting, scheduling, capacity planning, and machine assignment.



Shaochen Chen

Shaochen Chen joined IMSE as an assistant professor in July 1999. He received his B.S. degree in thermal engineering from Tsinghua University in China in 1989, his M.S. degree in mechanical engineering from the University of Akron in 1995, and his Ph.D. from the University of California at Berkeley in 1999.

His research area is micro-manufacturing, an emerging and highly interdisciplinary field covering mechanical engineering, materials science, physics, and electronics. Currently, Chen is developing an ultra-short laser micromachining technique to fabricate 3-D high-precision high-aspect ratio microstructures with applications in micro-electro-mechanical systems (MEMS) and biomedical devices. He is also conducting research on a photonics-based nano-fabrication and ultra-fast nano-sensing technique for optical recording. Moreover, Chen is interested in utilizing lasers to clean micron and sub-micron contaminants on technical surfaces in various industrial sectors such as semiconductor wafers, computer disk drives, biological tissues, and art restoration. Laser cleaning is a non-contact, non-chemical, and single-step technique.

During his graduate study at Berkeley, Chen worked closely with IBM researchers on several challenging issues facing the computer disk drive industry. Chen enjoys teaching—his philosophy is always to put yourself in the students' shoes. He intends to share his expertise in micro- and nano-fabrication techniques with both undergraduate and graduate students.

## IMSE Learning Communities

Many retention studies have helped higher education professionals to understand the reasons for the departure of students. Academic difficulty, unclear goals, lack of commitment, uncertainty, adjustment difficulty, financial hardship, incongruence, isolation, lack of integration, and absence of community membership can all contribute to students' attrition. Based on this understanding, there are many effective college retention programs that are designed to help college students overcome the shortcomings and stay in college to complete their degrees. In fall of 1998, under the coordination of our academic advisor, Ming-huei Lam, the IMSE department started to offer learning communities (LC) for our first-year students. All 19 freshmen and 3 transfer students chose to participate in the 1998 IMSE LCs.

What is a learning community? Throughout the higher education institutions in the U.S., there are many different variations of learning communities. For the IMSE LC, students are divided into teams that share a common schedule of courses (block scheduling) and have the option of living in the same residence hall. Each of these teams is an LC. Sharing a common schedule of courses doesn't mean that students only take

classes with IE students and have no opportunities to interact with students from other majors. Each team consists of four to eight students, and they take two, three, or four courses together in the same sections, but each course also has students from other majors. It's the same concept for the living option; students can choose to live on the same floor (separate floors for men and women), but there are also many non-IE students living on each floor.

The 1998 IMSE LC consisted of four teams. Each team had a different cluster of courses for both Fall '98 and Spring '99 semesters, with all courses applying towards IE degree requirements. Engineering 101 was the common course for all four teams in the fall, and IE 101 was the common course for the spring. In addition to taking clusters of courses together, academic/social supports and co-curricular activities are provided. Peer and faculty mentoring, industrial plant tours, supplemental instructions (provided by the Academic Learning Lab), and social events are the important components of the IMSE LC.

There were five peer mentors and four faculty mentors working closely with the 1998 LC. The mentors met and

communicated with their assigned students regularly. They had lunch or dinner with students in the residence dining halls, taught them how to use the computers, took them on tours of the computer labs, and sent encouraging email messages to them. Picnics, dinners at the advisor's house, bowling, and ice-skating are some of the social activities. The 1998 IMSE LC provided a supportive learning environment for its participants.

Our department plans to continue to provide LCs for the new students. The 1999 IMSE LC will consist of five teams—four for freshmen and one for transfer students. In addition to all of the activities in 1998, industry mentoring will be added. We already have four alumni from different industries volunteering to be industry mentors to our new students entering in Fall '99. They are Pamela Barrett, Director of Education and Publications, Healthcare Information and Management Systems Society, Chicago, Illinois; William Goodwin, President, Cerro Gordo Land Company, Des Moines, Iowa; Dave Heyn, Manager, Work Systems Engineering, Maytag Appliances, Newton, Iowa; and Kevin Mathis, Group Vice President, Seating, Hon Allsteel, Muscatine, Iowa. We have confidence that students will continue to benefit from the IMSE LCs.



## Industrial and Manufacturing Systems Engineering Scholarship Recipients - 1999-2000

Congratulations to the IMSE scholarship recipients on their achievements! We hope these awards will be an incentive to continue your excellent records and to propel you into equally outstanding and noteworthy careers in industrial engineering.

To our sponsors, our hearty thanks for working with us to provide scholarships for our students. We value them highly for the recognition they provide for high academic achievement and the contribution they make to alleviating the burden of ever-rising costs of education for students.

We have many deserving students. In the future, we hope to add new scholarships to recognize more students for their outstanding achievements.



### Scholarship Recipients

Association for Facilities Engineers  
College of Engineering  
College of Engineering  
College of Engineering  
Deere & Company  
Don Grant Incentive  
Eastern Iowa American Society for Quality Control  
General Motors  
Geraldine M. Montag Scholar  
Geraldine M. Montag Scholar  
Harold Jacob Reihman  
Harold Jacob Reihman  
Hempstead-Walkup  
Herb Erbe Memorial  
IIE Central Iowa Chapter  
IMSE General Scholarship  
Industrial Engineering in Health Care  
James McKean  
James McKean  
James McKean  
R. Seward, F. Ratcliffe & H. M. Galloway  
Stanley Howe-Pella  
Walt Lyons Memorial  
Webster Manufacturing

Christopher Murphy  
Craig Baumer  
Daniel Patanroi  
Indiarto Soesilo  
Laura Halstead  
Geovanti Steward  
Eric Flaknee  
Kara Johnson  
Nichole Harrington  
Geovanti Steward  
Sara Erb  
Shannon Nohr  
Chad Christ  
Peter Hoekstra  
Kara Johnson  
Ely Setiawati  
Melanie Anderson  
Ross Finnestad  
Christopher Mathiesen  
Kristelle Nordgren  
Melissa McDevitt  
Stephanie Deckas  
Allen Ihlefeld  
John Hensley

## Design 441

### Outstanding design awards earned by student teams

During the 1998-99 academic year, teams of students in the senior capstone design course competed to design solutions to problems posed by industrial partners.

Pella Corporation provided the design problem for the 1998 fall semester. Management at the new Pella Corporation facility in Story City, Iowa, asked for assistance in redesigning various assembly lines within their facility in order to improve work flow, better understand labor requirements, and improve productivity. Pella felt that the winning team did an outstanding job finding problem areas on the line and developing useful, well-thought-out solutions. The winning team as chosen by Pella Corporation was made up of (left to right in photo) Danny Djajakusli, Allison Ives, Pei-Ee Lim, and Chit-Onn Chong.



Pella team (L to R): Danny Djajakusli, Allison Ives, Pei-Ee Lim, Chit-Onn Chong

During the 1999 spring semester, John Deere in Ankeny, Iowa, asked for assistance in developing ideas to improve the layouts and operation of several warehouse areas. John Deere chose the team of (left to right in photo) Victor, Lydia Purnama, Yulia Lokasari, and Eric Flakne as their winning team. John Deere felt that this team developed very creative, yet low cost, ideas to improve the operation of their warehouse area.

The designs of each of these two teams were judged to be highly creative and practical. Each team received an award of \$400 from the respective industrial partner and the team members' names were added to a plaque displayed in the IMSE department. The department, Pella Corporation, and John Deere congratulate these students on their excellent design efforts!



John Deere team (L to R): Victor, Lydia Purnama, Yulia Lokasari, Eric Flakne

## Third Executive-in-Residence

IMSE's annual Executive-in-Residence program (EIR) took place during the third week of April. This program was created on the strong belief that the academic experiences of both students and faculty can be enriched through partnership and meaningful interaction with industry. The aim of the EIR program is to bring in accomplished people who have extensive industrial experience in fields related to the instructional and research missions of our department to share their wealth of knowledge through lectures, seminars, and meetings with the faculty, students, and administrators in the department.

This year's EIR was Keith Jessen. Mr. Jessen is the director of facilities services for the Collins Rockwell business of the Rockwell Corporation. Collins is a leading supplier of avionics, communications, and information distribution systems to the United States, foreign governments, and commercial customers. Mr. Jessen joined Collins Radio Company (currently a division of Rockwell) in 1967 and has progressed through positions of continually increasing responsibility in industrial engineering, manufacturing technology, and general management to his current executive assignment.

Keith's association with IMSE and Iowa State goes back a long way. He received his B.S. from Iowa State in industrial engineering in 1971 and his M.S. in the same field in 1978. Since 1978, the department has been fortunate to have had Keith's participation in the IMSE/Rockwell partnership experience. During this long-term commitment, Jessen was chairman of the IMSE Industrial Engineering Advisory Council from 1990 to 1997.

Keith Jessen has achieved much success during his career and shared his extensive industrial knowledge and experience with us by giving a public lecture, meeting with several industrial engineering classes, visiting with IE faculty, and being the keynote speaker at the IMSE student awards banquet.



Keith Jessen



## IMSE DONORS - 1998

Thank you! Thank you! Thank you! Your generous contributions help to provide the support IMSE needs to advance our academic programs. Your gift is a vote of confidence in the IMSE department at Iowa State and your desire to keep the program one of the best in the nation.

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## Re-engineering Casting Production Systems

During the past two summers, nine undergraduate and graduate students have worked at nineteen steel foundries across the country. Their work is part of a multi-year research project directed by Assistant Professors Frank Peters and Tim Van Voorhis and conducted in cooperation with the U.S. Department of Energy, the Steel Founders' Society of America, the individual companies, and the ISU IMSE department. The project is taking a fresh look at the production practices employed by steel foundries. Steel foundries (not to be confused with steel mills) are typically smaller companies that make a wide variety of components of different shapes, sizes, and alloys. This mix of parts results in problems with material handling and work in process inventories.

The goal of the project is to develop solutions for the individual companies and make improvements for the entire steel casting industry. Areas of focus include innovative layouts, scheduling, production control strategies, and the use of production simulation. The project is also providing our students with valuable manufacturing engineering experience.

## Professor Barta Spends Spring Semester 1999 Working for Delphi Automotive Systems in Singapore

Iowa State University encourages faculty in professional growth and development with a program called the Faculty Professional Development Assignment. Through this program, Tom Barta spent spring semester 1999 working for Delphi Automotive Systems in Singapore, a company in the business of manufacturing automobile wiring harnesses. He worked for Carl Rausch, director of Asia Pacific Operations at Delphi. Carl is a 1967 ISU alum in engineering operations who went on to receive an M.S. in industrial engineering from Wayne State University.

The goal for the semester with Delphi was to develop an inventory computer model to better understand how to increase inventory turnover in Asia. Delphi has manufacturing plants in Jakarta, Indonesia; Guangzhou and Shanghai, China; Delhi, India; and Kuala Terengganu, Malaysia. Raw materials for these plants come from all over Asia and Europe and the finished product is shipped worldwide. Keeping raw material (RM), work in process (WIP), and finished goods (FG) inventories at a reasonable level with this kind of supply chain is an important but difficult task. There are uncertainties in manufacturing times, shipping times, and customer forecasts that all contribute to large inventories.

To understand the effects of various factors on inventory size, a computer model was developed using simulation software, with input in the form of customer forecasts from a spreadsheet. The output from the model showed the level of RM, WIP, and FG inventory in units of the number of harnesses, the value of the harnesses, and the days of inventory on hand over a 52-week period, both as static and dynamic output. The model user is free to change the customer forecasts, lead times, safety stock, or costs to see the effect on inventory.

Professor Barta traveled through Indonesia, Malaysia, China, and India gathering data on material lead times, costs, order quantities, standard pack sizes, production control, and logistics functions. The end result was a model that is flexible, can be expanded, uses real customer forecasts, and shows the actual Delphi inventory value in the Jakarta, Indonesia, manufacturing plant. The model can be extended to other plants and expanded to include standard pack sizes and other variables. The entire experience was a great opportunity for Barta to understand current manufacturing problems and for Delphi to see how modeling and simulation can help solve those problems.

## IMSE Faculty and Staff Honors and Awards

John Even



John Even was selected by the Iowa State Alumni Association to receive the 1999 Faculty Citation. This award is given in recognition of outstanding and inspiring service to students and alumni of Iowa State University. John will be presented this award at the Honors and Awards Ceremony during Homecoming weekend this October.



Lori Bushore

Lori Bushore was selected by the Iowa State Alumni Association to receive the 1999 Superior Service Award. This award is given in recognition of outstanding service to students and alumni of Iowa State University. Lori will receive her award at the Honors and Awards Ceremony during Homecoming weekend this October.

Cheryl Moller-Wong



Ming-huei Lam



Frank Peters



Frank Peters received the Hamed K. Eldin Young Faculty Award, a first-time award sponsored by the *Engineering Design and Automation Journal*, at the 3<sup>rd</sup> International Conference on Engineering Design and Automation. This award recognizes and honors young industrial engineering faculty who demonstrate outstanding leadership abilities by leading and encouraging students and peers in the pursuit of knowledge and creative and innovative engineering ideas.

Engineering students selected eleven faculty and eight staff members for their outstanding work in the College of Engineering. Students voted by ballot to honor an outstanding professor from each engineering department as well as eight staff members. Cheryl Moller-Wong was selected from the IMSE department for her teaching and work with the students as was staff member Ming-huei Lam for her academic advising to IE students. They were recognized and presented certificates at a reception sponsored by the Engineering Student Council. Veishea 1999 Faculty and Staff Recognition was held April 14 at the Memorial Union. The IMSE department was honored to have two faculty members nominated for recognition, Cheryl Moller-Wong and Frank Peters.



Patricia Smith was one of three Raytheon Systems engineers honored at the 13th Annual Black Engineer of the Year Awards Conference in February. Smith, a quality assurance engineer based in Dallas, Texas, was honored for her achievements since entering the workforce. Smith joined Raytheon in 1995 and has continually performed critical statistical analysis and capability studies for the manufacturing processes at her facility. She received her B.S. in industrial engineering from Iowa State University in 1992 and her M.S. the spring of 1995.

Ruben Zayas, who received his B.S. from ISU in 1995, is a manufacturing engineer at Baldwin Filters in Kearney, Nebraska. In his position, he has the responsibility of providing immediate engineering support to all production areas; reviewing and assessing the efficiency of manufacturing operations to recommend improvements; and evaluating, specifying, selecting, purchasing, and installing new capital equipment. Ruben also acts as an internal consultant for the production departments in topics related to productivity improvements, safety and ergonomic concerns, and other production-related issues.

## Chocolate Factory

The Chocolate Factory is a hands-on demonstration of many of the concepts and methods utilized by industrial engineers. It was developed in the spring of 1998 by Drs. Moller-Wong, Peters, and Van Voorhis as a way to inform and excite high school juniors who attend the Engineering Honors Workshop (EHW) during the summer.

Chocolate Factory participants receive candy 'formulas,' marketing information, production routings, control charts, and quality inspection standards, as well as a profit formula. The participants form teams comprising a manager, a quality department, an operations research department, and production workers.

Chocolate is produced, inspected, and boxed within the two-hour time period. Distribution routes are determined and finally each team makes a five-minute presentation about what occurred in their factory and what improvements could be made. Faculty members discuss how these improvements relate to the courses taught in the IMSE department and the work that our graduates perform in industry.

In addition to EHW attendees, the Chocolate Factory has been used to introduce IMSE to a wide variety of groups including the Society of Women Engineers, the Newton Engineering Explorers, Career Trek, and over 200 visitors to the IMSE department display for VEISHEA 1999.

Evaluations indicate that participants enjoy this hands-on activity and learn a lot from it. The high marks may also be related to the fact that workers get to eat all of the chocolate candy that they produce!



The IMSE department and the Industrial Advisory Committee decided in early 1999 that we should select a random sample of alumni to learn more about their jobs and attitudes toward the department. If you would like to see a copy of the complete results, please feel free to write or call Dr. Roger Berger, chairman of the Alumni Relations Committee.

Out of 1,000 surveys sent, a total of 242 alumni responded. Among them, 110 (45%) have engineering responsibility in their current position.

Regarding industry, 32% are working in manufacturing, the largest among the respondents. Of those remaining, 12% are in consulting, 4% are in automotive industry, 4% are in education, and 21% are retired.

Regarding current/last professional status, 19% answered as a manager/senior staff, 14% as a CEO/COO/CFO/CIO/partner, 13% as a staff engineer, 12% as a director/department head, and 12% as other senior management. Thirty-six percent have a responsibility to hire or are able to influence the hiring of industrial or manufacturing system engineers. Additionally, 28% answered that their company recruits industrial or manufacturing systems engineers at ISU. Among these respondents, 66% were satisfied with the skill sets and technical knowledge of our graduates, 15% were indifferent or neutral, 1% were somewhat dissatisfied, and 18% did not respond.

Concerning the general attitude toward the ISU IMSE department, 71% were positive, 18% were indifferent or neutral, and 10% did not respond. Respondents keep in touch with department activities in the following ways: newsletter, 63%; fellow graduates, 12%; students, 7%; faculty or staff, 6%; web site, 6%. Twenty-six percent did not keep in touch with the department.

Regarding the IMSE newsletter content, 61% were positive, 25% were indifferent or neutral, and 14% did not respond. For the web site, 10% were positive, 28% were indifferent or neutral, 1% were negative, and 61% did not respond.

## VEISHEA 1999

VEISHEA 1999 was a great success in the industrial engineering department, centering around its annual open house.

Planning for the event began about six weeks prior to VEISHEA weekend. A volunteer committee was formed of approximately ten graduate and undergraduate students. We had two goals for this year's display. First, we wanted the display to be used as a recruitment effort for visiting high school students and undecided freshman. Second, we wanted to use the display as a formal goodbye to our long-beloved Engineering Annex.

It turned out that both goals were met beyond expectations. Over two hundred visitors viewed the displays from 8:00 a.m. to 5:00 p.m. on Saturday, April 17. One of the attractions included an interactive display called The Chocolate Factory. In its full form, The Chocolate Factory is meant to simulate an entire production system. From planning to manufacturing to inspection and quality control, The Chocolate Factory is not only a tasty activity, but it is also very educational. However, for most of the simulations, many of the details were left out. For example, we felt five-year-olds were probably not quite ready to make control charts on their chocolate candies. Nevertheless, everyone had a great time and learned a little about industrial engineering in the process.

Besides the fun everyone had in The Chocolate Factory, an AGV was continually motoring around the building and there was a robotic arm building the letters IMSE out of Lego blocks. In addition to these dynamic displays, several posters depicting the different aspects of industrial engineering were displayed, including a poster that detailed the history of the Engineering Annex and the future of industrial engineering at ISU.

Everyone seemed to love all aspects of the display, and the department couldn't be happier with the turnout!



Chocolate Factory



Industrial Engineering Display Posters



Industrial and Manufacturing Systems Engineering  
College of Engineering  
205 Engineering Annex  
Iowa State University  
Ames, Iowa 50011-2070

## Delegations

The IMSE department hosted two different academic delegations from foreign countries in October. The first was a one-day visit by a group from Bergen College of Engineering in Norway that consisted of Leiv Saebo, Dean; Karl Olav Nummedal, Associate Dean; and Gunnvald Hella, Adviser and Officer of Administration. They came to ISU to explain their collegiate program, which allows fourth-year students at Bergen to choose to come to the U.S. to finish school or to complete their education in Trondheim, Norway. While at Iowa State, the delegation toured several engineering labs, met with various faculty members and admissions personnel, and discussed curriculum initiatives within the college.

A week later a delegation representing the Indonesian Ministry of Education and Culture

came for a three-day stay. The members of that team were Mr. Isa Setiasyah Toha, Dr. Ali Basyah Siregar, and Dr. T. M. A. Ari Samadhi, all from the Bandung Institute of Technology; Dr. Budi Santoso Wirodirdjo from the Sepuluh Nopember Institute of Technology; and Dr. Sukaria Sinulingga from Medan. The group's purpose was a benchmarking visit to improve engineering education in Indonesia, officially dubbed an engineering education development project and funded by an Asian Development Bank loan. The IMSE department was one of the target institutions for that benchmarking program. While here, the group was able to tour various facilities and meet with many IMSE faculty regarding both teaching and research operations within the department. They also spent time with engineering students currently here from Indonesia.



*Indonesian Ministry of Education and Culture Delegation (L to R) Sukaria Sinulingga, Ari Samadhi, Isa Toha, Ali Siregar, and Budi Santoso.*

## ALUMNI—WHERE ARE YOU? ■ YOUR SUPPORT MAKES A DIFFERENCE

We want to hear about your career moves and personal news for an alumni news page in future editions. We need your help, too, with donations to scholarship funds, lab facilities, and student groups, etc. If you're making a contribution to your alma mater, please consider designating it for the Department of Industrial and Manufacturing Systems Engineering. You may enclose your gift with the form below and mail to Donna Cerka, Department of IMSE, 205 Engineering Annex, Iowa State University, Ames, IA 50011.

Name \_\_\_\_\_  
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I want to tell you about: \_\_\_\_\_  
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You can call 515-294-1682, send fax to 515-294-3524, or email [dmcerka@iastate.edu](mailto:dmcerka@iastate.edu) with your news.  
VISIT OUR WEB <http://www.eng.iastate.edu/~imse/>

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