PRACTICAL LAB EXPERIENCES PREPARE STUDENTS FOR INDUSTRY

Laboratory practice, with an element of design, is a significant component of both the undergraduate and graduate programs in IMSE. Our goal is to provide students with an environment in which they can apply and integrate the design, operation, and control of manufacturing systems. Here’s an update of the eight laboratories that currently serve undergraduate students.

Industrial Design
This lab primarily serves IE students during their design efforts for Industrial Engineering Design, the senior capstone design course. An industrial partner provides students with a real-world design problem that is open-ended, represents an existing need, and is typically a facilities design/layout problem. Students, in teams of three or four, synthesize solutions and present them through written and oral reports to the industrial partners at the semester’s end.

Computer hardware and software available in the lab assist students throughout the design process. The lab also serves as a classroom for the design meetings. Although the focus of

Quality lab

the lab is the Industrial Engineering Design course, the facility also provides access to computers and software for several other IE courses, including Applied Ergonomics, Operations Analysis, and Industrial Materials Handling.

Hardware includes eight workstations for students (Zenith and HP), a Zenith Network Server, two HP plotters, and an HP LaserJet printer. A computer overhead projection system has been provided by John Deere Ottumwa works.

Ergonomics
Through the use of appropriate instrumentation, this lab offers students practical experience with ergonomic concepts, workplace principles, and task design. Equipment includes a Lafayette Instrument Datagraph, Complex Reaction Timers, eight computers (Zenith), two printers, and a Vincent DECstation 2100 workstation. Mannequins, Work Physiology, and Biomechanics software are also available in the lab. Equipment needs include computer interfaces for direct input of physiological and biomechanical data and appropriate transducers, complete video analysis system for biomechanics analysis, complete electromyographic system, lap top computers for on-site use by students, and an oxygen measurement system for workload analysis.

Operations Analysis
This lab serves our Operations Analysis course. Facilities and equipment in the lab are used for exercises in work measurement, workplace rating, motion study, micro-motion study, work sampling, predetermined motion times, workplace design, process design, assembly line balancing, man-machine relationships, and learning curves. The lab contains a line balancing assembly unit, man-machine charting equipment, video equipment, micromotion study equipment, and a 26-inch monitor.

Manufacturing Processes
This lab serves our Industrial Methodology course. Students learn how to operate and program the equipment, using it to investigate basic metal chip-removing processes and NC programming. In addition to eight computers (Macintosh and Zenith) and a Vincent 2100 DECstation workstation, the lab equipment includes two DynaMyte 2800 CNC milling/drilling machines, a DynaMyte 300 CNC lathe, a Langun 6-axis manual milling machine, and a Takisawa manual lathe. Equipment needs include four manual mills, four manual lathes, two additional CNC mills, a CNC lathe, and a Grinder.

CAD/CAM
The CAD/CAM laboratory serves our CIM I and II courses. Students use graphics software and engineering workstations platforms to construct software for

continued on page 3

THREE NEW LABS PLANNED

To continue departmental efforts to help students gain valuable hands-on experience, plans are in progress for three new laboratories.

The Casting/Welding Laboratory will serve the Industrial Methodology course and future new manufacturing courses. No equipment has been obtained to date. Equipment needs include investment casting equipment, induction furnaces, sand molds, and welding stations.

The Electronics Assembly Laboratory will serve several courses, including Industrial Methodology, Manufacturing Systems Control, Industrial Materials Handling, and Computer-Integrated Manufacturing. We are pleased to report that the following equipment donated by Rockwell International is on site, waiting to be installed: circuit board assembler with robots, screen printing, part feeders, and material handling and inspection equipment.

The Robotics Laboratory will be used mainly by two courses, Industrial Materials Handling and Computer-Integrated Manufacturing. Three assembly robots and a programmable logic controller are on order, waiting to be installed in this laboratory.

IMSE GAINS MORE SPACE

Good News! New Space!... Well, not exactly new space...but it is more space. We are moving out of Marston Hall and into the Engineering Annex where we acquired space being vacated by the Department of Materials Science Engineering. Approximately 75 percent of the building will be ours.

The ground-floor level consists of office space adjacent to laboratories and a nice suite comprised of six new offices and a small conference room. The ground floor also will house three new laboratories: a casting/welding lab, an electronics assembly lab, and a robotics lab. The senior capstone design laboratory for IE 441 will move from Marston Hall to the second floor of the Annex.

In addition, the manufacturing processes lab will move from the basement of the Nuclear Engineering building to a ground-floor room in Sweeney Hall. This new space offers tremendous improvements in lighting and ventilation and will relieve the difficulties involved in moving the processing machines in and out of the room.

Now for the bad news: all of our available space is already filled. Wishful thinking is that we will have our own building one day!
The ISU Department is ranked among the top 50 in the nation for its outstanding research and teaching.

Welcome to our new faculty members, Dr. Carolyn Heising and Dr. Raymond Cheung.

Dr. Carolyn Heising joined the ISME department as an assistant professor in August 1983. She received her B.S. (1984) and M.A. (1986) degrees in applied mathematics from York University in Canada. From 1985 to 1987, Dr. Cheung taught operations research and quantitative analysis at Hong Kong Polytechnic University.

Dr. Cheung’s area of research is the development of optimization-based planning systems for logistics, transportation, and related operational problems.

This work involves developing and testing models and algorithms, software implementation, graphical display of results, and managing databases required to solve these problems. His research activities have spanned two areas. The first area focuses on a real-time, freight-dispatching planning system that involves routing drivers and timing the departure of freight. The objective is to minimize operating costs at a high level of service subject to complicated constraints, such as labor union rules. The second area centers on modeling and solving stochastic networks. In such networks, decisions must be made over time, under uncertainty. Applications of these problems can be found in manufacturing, telecommunications, and financial planning. Studies in network, telecommunication network, financial planning, production, and distribution planning.

In this laboratory, an automated manufacturing system and a data-gathering guided vehicles provide hands-on experience in material handling.

The laboratory is still in the development stage and needs an automated storage system.

Please stay in touch!

We want to hear about your career moves and personal news for our alumni newsletter. We’ll publish your highlights in the alumni newsletter.

We need your help, too, with donations to scholarships, labs, facilities, and student groups. If you are making a contribution to your alma mater, please consider designating it to the ISU Materials Handling Laboratory.

If you receive a solicitation in the mail, you can call the Materials Handling Laboratory at 555-1234.

If you’re interested in donating, please return the enclosed donation envelope.

If you have any questions, please contact the Materials Handling Laboratory at 555-1234.

Thank you for your support of the Materials Handling Laboratory.

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

ALUMNI SPOTLIGHT

Deanna (Tormo) Junga received her B.S. in industrial engineering from Iowa State University in 1991. Following graduation, she joined John Deere Dubuque Works as a manufacturing engineer, in the loader backhoe division. Her first assignment was in the assembly of John Deere’s new 710D series backhoe. She was responsible for tracking potential assembly and fit-up problems, as well as identifying tooling and fixtureing that would be necessary when the product was integrated with an existing assembly line. She worked closely with design and manufacturing engineers to identify possible improvements and keep track of potential changes in product design that might affect assembly.

Deanna recently moved to quality engineering where she is responsible for the qualification of new manufacturing equipment and the process capability of existing equipment. After identifying product features that are critical during welding, machining, and assembly operations, she works with design engineers to set appropriate tolerances. Machine capability studies are conducted to verify that the machine will be able to meet tolerance specifications.

Deanna also is pursuing an MBA degree at the University of Iowa.

1938

Laura F. Harton, GE professor emerita of organization and management in the Marriott School of Management, Brigham Young University, has written a how-to book, 

*Efficiently Effective at Work: Better Government for All,* published by Marcel Dekker, Inc., New York, N.Y. He resides at 1555 N. Oak Lane, Poolesville, Md.

1979

Katherine A. (Peters) Dugannes, EE, is senior manager at Ernst & Young’s Management Consulting Practice and specializes in performance improvement in the public sector and utilities. She resides at 620 W. Wedgewood Ln., La Habra, CA, 90631.

1980

Paul S. Adams, EE, earned his Ph.D. in industrial and operations engineering from the University of Michigan, May 1, 1980. He accepted a position as assistant professor of occupational safety at Illinois State University.

1983

Stephen B. Moore, EE, recently assumed the top civilian position, technologist deputy director at the defense mapping agency combat support center, a major combat support agency of the Depart-

ent of Defense. His address is 9001 MacArthur Blvd., Bethesda, MD 20880-5001.

Tom L. Nauman, EE, joined Puritan-Bennett POC&F Division in Burbank, California in September 1993 as an industrial engineer.

1985

Sandra J. (Neal) Blevins, EE, married Sam Blevins, May 1, 1985. She was promoted to manager, retail support center, Sears Corporation, Spring Hill, Tennessee, in August 1992.

1987

David G. Rush, EE, has been promoted to principal of Kelton Salzmann Associates, an international management consulting firm, headquartered in Atlanta, Georgia. Mr. Rush is a specialist in distribution and logistics strategy and design.

1989

Chris Wagner, EE, manufacturing engineering radiate director, Ford Electronic & Refrigeration Co., 4147 Western Ave., Cocoa Beach, FL 32937.

1990

Mark Steffer, EE, is management engineer at the University of Iowa Hospitals and Clinics in Iowa City. His address is 35 Lincoln Avenue 42, Iowa City, IA 52242.

1991

ELA Scott D. Pasley, EE, graduated from USAF pilot training in April and is flying KC-135 aerial refiners. His address is 2732 57th, Apt. B201, Spokane, WA 99223.

PIONEER ORGANIZATIONS SCHOLARSHIPS

Recipient | Amount
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Benjamin Jorgensen | $500
Christopher Somerseth | $1000
Renato Marnato | $350

ENDOWMENT AND MEMORIAL SCHOLARSHIPS

Recipient | Amount
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Justin Hanneson | $750
Sarah Dunn | $1000
Tamara Boling | $1000
Jason Rees | $1000
Kasia Marteau | $1000
Jana Johnson | $300
Robert Easterling | $300
Kira Schrader | $1100
Angela Sefert | $1100
Michael Weiss | $850
Theresa Wixen | $250
Melissa Rainey | $250
Ryan Wells | $2000
R. Mardelthanne | $200
Jill Haddad | $1000

STUDENTS’ CREATIVE, PRACTICAL SOLUTION EARNS OUTSTANDING IE DESIGN AWARD

During the 1993 spring semester, teams of students in the senior capstone design course competed to design a solution to a problem posed by SteelWorks of Des Moines. They were asked to design new facility layouts for security box and filing cabinet manufacturer. Designs were evaluated on originality, feasibility, thoroughness, and written and oral presentation. The winning team (left to right), Katrina Burmeister, Cynthia Snyder, Leatha (Davis) Larson, and seated, Elizabeth Erb developed a design judged by SteelWorks to be highly creative and practical for the needs of SteelWorks. The team received an award of $400 from SteelWorks and their names were added to a plaque displayed in the IMSE department. The department and SteelWorks congratulate these students on their excellent design effort.