Message from the department head

I am delighted to share with you our department’s impressive strides during the past year in this issue of the MNE newsletter. Year 2002 has been a year of challenges, successes, and new opportunities. Of course the budget cuts have presented us with major challenges, but we are fortunate to have a most dedicated faculty and staff who have teamed up to deal with the challenges and continue to seek new opportunities. Our faculty members have been very successful in increasing our research funding level, have played a major role in reforming our curriculum, and have helped to revitalize our nuclear engineering program. For example, the level of funding in the nuclear area alone has exceeded the million dollar mark this year. The MNE department’s enrollment has increased by 7% to 534 students this year, and our students continue to excel academically and in professional competitions. And of course, our energetic staff members have done an outstanding job of supporting faculty and students and are an integral part of our team. The following are a few of the faculty recognitions:

- Dr. Terry Beck received a 2002 NASA Summer Faculty Fellowship.
- Dr. Dean Eckhoff was the recipient of the Bob and Lila Snell

Distinguished Career Award for Excellence in Undergraduate Teaching.
- Dr. Kevin Lease received the Big 12 Faculty Fellowship Award.
- Dr. Warren White received a Boeing Summer Faculty Fellowship Award.

I wish to take this opportunity to thank you for your interest and support. Staying in touch with our alumni and friends is important to us, so please feel free to contact me with any suggestions. Thank you.

M. H. Hosni, Ph.D.
Department Head and
Frankenhoft Chair in Engineering

Industry advisory board meets many needs

The Department of Mechanical and Nuclear Engineering Industry Advisory Board was formed in the fall of 1999 and met for the first time in November of that year. It is comprised of a group of diverse leaders from industry who are interested in the continual improvement of the department. The purpose of the industry advisory board (IAB) is to establish a direct link between the department’s undergraduate, graduate, and research programs and the industries related to these programs.

The IAB helps the department strengthen its learning, research, and outreach programs, expand its base of support, and serve its alumni. Members actively participate in the continual assessment of the department’s progress toward the development of department/industry partnerships. IAB members provide input into the department’s missions, goals, and programs. They independently and critically review the department’s performance as compared to other institutions. They also provide the faculty with an understanding of the workplace in which graduates

Continued on page 5
William Dunn—a strong addition to MNE

The nuclear option of the mechanical engineering degree grew from 23 to 34 students in fall 2002. To accommodate the increase and improve the quality of our program, the mechanical and nuclear engineering department has hired a new faculty member. William Dunn, formerly an assistant professor at North Carolina State University is the latest associate professor of mechanical and nuclear engineering.

Dunn received his B.S in electrical engineering from the University of Notre Dame in 1968. He then went on to graduate school receiving a M.S. in 1970 and a Ph.D. in 1974, in nuclear engineering, from North Carolina State University.

From 1973 to 1977, Dunn was employed as an in-house nuclear engineering consultant at Carolina Power & Light Company where he conducted radiotracer studies of the service water system at the HIB Robinson Nuclear Power Plant. Dunn has also worked at the Research Triangle Institute, a not-for-profit contract research firm and, along with two other engineers, opened the Raleigh, N.C. office for Applied Research Associates — a small business research firm. While with ARA, he was appointed head of the mechanical and nuclear engineering unit and served as project director for the state of North Carolina’s $2 million bid to be the site of the Superconducting Super Collider. In 1988, Dunn left ARA to form Quantum Research Services, Inc., a small business research company where he served as president until he was hired at K-State.

Dunn’s research areas are application of radiation and Monte Carlo simulation. Specifically, his interests include nondestructive evaluation, radiogauging and radiotracing, applications of plastic scintillating fibers, inverse and optimization methods, and radiation shielding and dosimetry.

“The MNE department is fortunate to have been able to recruit someone with Dr. Dunn’s extensive background, knowledge, and research experience”, said Mo Hosni, MNE department head.

by Tracey Pinsent

Curriculum reform—an innovative idea

The biggest change in the mechanical and nuclear engineering department for this year is the adoption of a new curriculum. The faculty, with input from MNE students and the industry advisory board, developed the curriculum and finally saw it approved by faculty senate in May of 2002. It was designed to improve on the old curriculum by focusing on 1) efficiency, 2) flexibility, and 3) student centeredness.

1) Efficiency
The number of required credit hours for graduation was reduced from 134 to 127. Some course content was also revised or consolidated to include new and improved material. This will help alleviate some of the scheduling problems, as well as help to keep the cost of courses down.

2) Flexibility
Many of the upper-level MNE courses, as well as some non-engineering courses, were designated as technical elective courses. This allows students to choose a more specific emphasis area within the department and take courses from other interest areas such as business, biology, chemistry, physics, etc.

3) Student Centeredness
Engineering concepts are now introduced to incoming freshmen through a new ME101 course. Students will no longer have to wait two years before seeing any technical content from areas of mechanical and nuclear engineering. This will ensure that they are given the utmost attention beginning with their first semester within the department.

Current students in the department who started under the old curriculum have the option to finish under those requirements or switch to the new ones. Most agree that the curriculum change was for the better and will continue to improve the entire department and the engineering education it offers.

by Paul Woods

MNE Women set goals for organization

Mechanical and Nuclear Engineering Women, or MNE Women, was formed in fall 2001 by a small group of female students. The mission of MNE Women is to "promote recruitment and retention through active involvement, service, mentoring, and support through the mechanical and nuclear engineering curriculum." MNE Women plans to have one meeting per month during the academic year. They will be looking at providing a student-to-student advising session where underclasswomen can learn from the collective experiences of the upperclasswomen. MNE Women would like to become a springboard for women to encourage their future involvement in engineering clubs. The group plans to focus heavily on recruitment into not only the MNE department, but the engineering college as a whole by informing incoming freshmen and general engineering students about the engineering discipline.

by Diana Grauer
Strong showings for Society of Automotive Engineers

The Society of Automotive Engineers (SAE) has reached another milestone this year. At the first chapter meeting, more than 100 students attended to find out firsthand what SAE is all about. Including industry speakers is a staple within the chapter, and it is fortunate to have sought-after professionals participate in chapter meetings. Along with hosting industry speakers, the group also sponsors the collegiate design series.

Both the Mini Baja and Aero Design teams placed favorably in all competitions they competed in. Aero Design led the way by finishing second in the U.S. and fourth internationally at the Aero Design East event held in Titusville, Fla., by lifting 19.5 lbs with their remote-controlled vehicle. In June, at the Aero Design West event, the team again outdid themselves by accruing more points in design, presentation, and flight than they ever had before. Attempting to lift 23.5 lbs in the final round just wasn’t enough to edge out the competition, but they did manage a respectable eighth place.

The Mini Baja Teams, Baja 1 and Baja 2, also had a strong year by placing in the top third in their respective competitions. They took an innovative approach this year by utilizing as much composite material as possible for Baja 1. With an ultra-light frame and composite components, they bested the field in total vehicle weight.

Solar car racing team performs well

The KSU Solar Car Racing Team entered two cars in the same race for the first time this past summer. CA\text{atalyst}, the 2001 car, and Apollo, the 1999 car, competed in the Formula Sun Grand Prix held at Heartland Park, Topeka.

CA\text{atalyst} placed third in open class, and third overall. Apollo finished first in stock class, and sixth overall in a field of 12 cars. CA\text{atalyst} completed 418 laps around the 2.1-mile road course and Apollo did 305 laps, trailing only three laps behind the open class entry of Iowa State.

In addition to achieving their goal of a top-three finish of both cars in their respective classes, the team also set the record for the fastest figure eight and won the pit crew challenge. Scott Hammack piloted CA\text{atalyst} to a very impressive 11.03-second pass on the figure eight, almost twice as fast as the minimum time needed to qualify the car. The team also beat out the competition in a head-to-head race to see who could change drivers and a tire the fastest. Members not only had a good time at the week-long race, but also gained a great deal of experience by working with two different cars.

Team members are looking forward to another summer of solar racing as they prepare for Formula Sun 2003. That race will be held as a qualifying event for the 2003 American Solar Challenge, a cross-country race from Chicago to Los Angeles on Route 66.

by Jay Nighingale
Baja 2 showed great promise by placing 28th in the Mini Baja Midwest event out of 129 competitors. In the West event, the KSU teams placed 33rd and 56th out of one hundred teams.

Formula SAE has embarked on a totally new design that should offer success in this area of competition as well. The chapter is committed to producing the best possible vehicles by encouraging student participation in all areas.

by Jeremiah Jorgensen

MNE students recently had the opportunity to sit down with department head Mo Hosni and discuss the effects of budget cuts on the MNE department. He was able to explain where the department is now and what its priorities are for the future. Last year the department was asked to return 3.5% of its budget, which is more than double what most of us hope to make for our first job. The department is also preparing for a similar situation to occur at the end of this year.

However, Dr. Hosni was clear that one of the biggest priorities within the department is to limit the effect of the budget cuts on students.

So far, from the students' perspective, it has been a seamless transition between the old and new. The only apparent effect the students have witnessed is the restriction of printer copies. Students are basically only affected by financial matters in four areas: scholarships, student organizations, lectures, and labs. Thankfully, scholarship funds do not come out of the department's budget. Therefore it is expected that the amount of money available for scholarships will remain the same, provided our alumni continue to contribute to the scholarship funds.

Student organizations and their extracurricular endeavors are something the department sees infinite value in. Dr. Hosni said MNE wants to see every student involved in an organization; therefore, it is willing to put forth the effort and money to see that it happens.

Our lecture and lab classes will receive the brunt of the budget cuts' effects. Professors will be the first to feel it. Because the department is avoiding using graduate students to teach lecture classes, professors are putting in extra effort by teaching extra classes. In some classes, increasing the number of students is the answer and in others, reducing how often a course is offered or eliminating a course may be the solution. Some classes are already offered only once a year, and if budget cuts continue, these spring- or fall-only courses could change to only every third or fourth semester offerings.

Does this sound bleak? It isn't yet, but the department is on the border of uncomfortable and painful. So, as students, we need to ensure that the message is heard. Representatives and state officials who are in charge of our funding often respond to the loudest voices. Therefore, please let your family and friends know that the state of our education is at risk. If our collective voices are heard, our budget woes could soon change for the better.

by Jeremiah Jorgensen and Tom Ball

Like the MNE newsletter?
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Laboratory renovation and upgrade completed

Recent graduates may not recognize the look and activities in the Dynamic Systems and Controls Laboratory. It has been renovated and upgraded with new hardware for experiments. All MNE students utilize this laboratory for at least one semester before they graduate, and possibly for several semesters. It is a busy place. For example, during the fall 2002 semester, seven different lab sections with up to 16 students met each week in this laboratory. These sections service a range of courses from required undergraduate MNE courses to undergraduate electives and graduate courses.

During the summer of 2002, the laboratory was given a facelift. The walls were painted and old hardware was removed. Storage space was cleaned out and reorganized to make room for new hardware. Additional chalk boards were placed, and new visual projection equipment was added. Aging laboratory stools were updated with comfortable task chairs for the students. The lab was partitioned into two different spaces to separate the activities of graduate research and of laboratories for courses, allowing the space to be utilized much more efficiently.

The most important changes for the laboratory are in the form of new laboratory equipment for student experimentation. Computer hardware and software for each of the eight laboratory stations have been added and upgraded. National Instruments’ Labview software and data acquisition hardware have been added. Also, motion-control cards, like those used in industry, have been installed in each of the computers. Two different sets of motor-driven dynamic systems were designed and constructed by department personnel. These systems can be configured in many different ways to facilitate different laboratory experiences for the students, ranging from brief experiments for introductory undergraduate courses to more involved and in-depth laboratories for graduate work. Each of the two different sets includes at least eight individual systems, one for each laboratory station. Also, a set of eight dynamic systems for thermal systems experiments has also been designed and constructed.

The new facilities are well received by the students, especially the more comfortable chairs. Students now have more hands-on experience with real dynamic systems. The laboratory content has moved away from computer simulation to a combination of computer simulation with supporting real-world data. Much of this activity has been funded with monies from external grants to the university, a result of the efforts of three different faculty members and several graduate students.

Industry advisory board meets many needs

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function, which can better prepare MNE graduates to excel in this environment. They identify opportunities for research and continuing educational development, and offer suggestions with regard to management, faculty evaluation, and educational methods that can be applied or adapted.

The IAB was very active in the development and evaluation of the new curriculum. They are currently working on the creation and administration of a survey that will be sent to various K-State alumni. This survey will allow the IAB and Department of Mechanical and Nuclear Engineering to better evaluate how well K-State graduates are prepared for the profession and how well they perform both short-term and long-term after graduation. The current chair of the industry advisory board is Ken Habiger.

by Diana Grauer

Dale Shinstock, MNE asst. prof., discusses experimental data from a control experiment with Mechanical System Dynamics students.

The "MotorLab" apparatus is used in many dynamics and controls experiments.
Dear Alumni and Corporate Friend,

Please support the Department of Mechanical and Nuclear Engineering at Kansas State University through your financial contributions and/or comments/recommendations on our curricular, research, and service activities. We are grateful for this partnership and hope you will consider supporting your alma mater.

Yes, I wish to demonstrate my support for the students, faculty and MNE department programs with my gift of:

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