Message from the Chair

The year 2007 was one of continued growth for the department. Recently, our new president Jay Gogue visited ME, and I had the opportunity to present a report on the status of the department. After reviewing our statistics, I presented “Mechanical Engineering: The Flagship Academic Department of Auburn University” to President Gogue.

Let me share with you why I made this bold assertion. The department has a long list of accomplishments to be proud of:

- The largest undergraduate enrollment in the University (637 students);
- The second largest graduate enrollment this year (128 students) and the largest graduate enrollment last year (133 students);
- Second largest research awards this year ($6.3 million dollars and 9 percent of total university awards) and highest research awards last year ($10.1 million and 15 percent of total university awards);
- In extracurricular activities, our student Baja and Formula teams finished first out of 80 major university competitors, and third out of an international field of some 150 competitors, respectively.

In an interview with The Plainsman, President Gogue commended the department on its initiative in administering the MECH 2000 and 3000 exams to assess our students’ grasp of pre-requisite material as they moved through the curriculum.

We also just finished our most successful ME conference yet, in which we had 35 registrants along with their spouses. The conference dinner included a presentation by Carver Kennedy, a 1957 ME alumnus and retired vice president of space services at Kennedy Space Center for Morton Thiokol, Inc. His presentation on the space program included a discussion of his role in leading the redesign of the shuttle's O-ring seal. The presence of several participants from other universities gave us an excellent opportunity to showcase our program and to gain a wide range of feedback to further enhance our program. I hope you will consider coming to this year’s conference which will be announced in the next newsletter. We will again be offering 12 PDH hours for those maintaining professional registration. The conference will be scheduled for Sunday afternoon and Monday following the homecoming game.

It is with some sadness that we must report in the death of two men who made outstanding contributions to our department: John Scarborough, a longtime faculty member, and Bill Walker, former engineering dean, president of the university and faculty member of our department. These stories along with many inspirational reports on student, faculty and alumni successes are included in this issue.
Let me again express my appreciation for the many contributions that alumni have made in support of the department and students. We are very close to reaching our goal for the finances needed to build a new mechanical engineering building. Please don’t hesitate to let me know if you wish to help in some way in reaching that goal. I assure you that all the support generated for the department will be used wisely to advance towards the goals we have set. Also, please remember that you can earmark your contribution for mechanical engineering. In addition to raising the necessary support for our new building, my major interest is in developing a flexible endowment for excellence for the continued benefit of the department.

David Dyer
Department chair and professor

Vehicle decontamination

The control of epidemics and pandemics is a key issue for the civil aviation community. The recent SARS outbreak and the concern over the spread of avian influenza serve as a warning of how rapidly disease can spread in the age of global mobility. Furthermore, civil aviation has long been subject to the threat of terrorism, culminating in the tragic events of 9/11. Given the history of the use of chemical and biological agents by terrorists and rogue states, there is concern that these could be employed to target airliners. Their impact, in both human and financial terms, is huge.

To address this need, the Air Transportation Center of Excellence for Airliner Cabin Environment Research (ACER) conducted a demonstration of the use of advanced decontamination technologies for civil aviation applications. The demonstration evaluated two technologies at a Federal Aviation Administration site in Oklahoma City. The first of these was a thermal decontamination system, produced by AeroClave LLC of Orlando for eliminating viruses. The second technology was Vaporized Hydrogen Peroxide (VHP), from STERIS Corporation, for destroying those biological agents that are challenging to eliminate.

“This is the first demonstration of decontamination that is suitable for use with wide body airliners, as opposed to military hardware,” said ACER executive director and Auburn University Alumni Professor William Gale. According to Gale, ACER has also demonstrated the same technologies for decontaminating railcars and evaluated their use for buses and ambulances.

Auburn University is the lead in the seven-university Air Transportation Center of Excellence for Airliner Cabin Environment Research (ACER). ACER is sponsored by the Federal Aviation Administration’s Office of Aerospace Medicine, based at FAA Headquarters in Washington, D.C. As of August 31, ACER became the National Center of Excellence for Research in the Intermodal Transport Environment (RITE), reflecting a broadened focus for the center. For more information please visit the ACER web site at acer.eng.auburn.edu.

ACER’s wide body airliner decontamination demonstration. The equipment used to decontaminate the entire airliner cabin is visible on either side of the aircraft.
**Department dynamics**

**David Bevly** was recently awarded a project from the Federal Highway Administration (FHWA). In May 2007, his team (Oshkosh and SciAutonics/Auburn) passed the site visit and participated in the National Qualifying Event (NQE) for the 2007 DARPA Urban Challenge. The competition tested the unmanned vehicle’s ability to execute a simulated military mission within the confines of an urban area.

The Alabama Department of Economics and Community Affairs (ADECA) invited **Sushil Bhavnani** as one of five AU representatives to serve on the Permanent Joint Legislative Committee on Energy Policy. The committee was created by Act 2007-150 (formerly HJR 152, introduced by Representative Greg Wren). According to Wren, Alabama is uniquely positioned to utilize its vast renewable resources and existing energy producers to decrease its dependence on foreign oil by developing and implementing responsible energy policies for its citizens. The committee enlists a broad array of legislators, ADECA, the Alabama Department of Agriculture and Industries, universities, energy producers, renewable energy stakeholders and consumers in an initiative to develop a comprehensive energy plan for the state. The legislative committee is chaired by state Sen. Wendell Mitchell of Luverne.

“Alabama must research, design and implement a comprehensive approach to an energy policy to improve the framework for economic development opportunities for generations of Alabamians,” said Rep. Wren. The committee is charged with studying the state’s energy supply and developing a state energy plan to encourage diverse energy uses, greater efficiency and conservation. The committee is required to submit recommendations on developing an alternative fuel market by the 15th day of the 2008 legislative session. Other AU representatives on the committee are David Bransby (Agronomy and Soils, College of Agriculture), Larry Fillmer (director, AU Natural Resources Management and Development Institute), Buzz Powell (manager, NCAT Test Track) and Steve Taylor (head, Biosystems Engineering).


The NASA-Glenn grant that Crocker received for “Rocket Exhaust Noise Prediction at Launch of Spacecraft,” was extended up to October 2010. In collaboration with Roy Hartfield (aerospace engineering), Crocker received another grant from NASA-Johnson on the prediction of the turbulent boundary layer pressure fluctuation noise, separated flow noise and oscillating shocks on the new Orion/Ares spacecraft to replace the shuttle orbiter.

Crocker served as the scientific chair at the 14th International Congress on Sound and Vibration. Sponsored by the International Institute of Acoustics and Vibration (IIAV) and the Australian Acoustical Society (AAS), the Congress was held at the Cairns Convention Centre in Cairns, Australia. IIAV is an international non-profit scientific society affiliated with the International Union of Theoretical and Applied Mechanics (IUTAM). IIAV currently has 550 individual members in 55 countries and is supported by 31 national and international scientific societies and organizations.

An article by Jay Khodadadi and S.F. Hosseinizadeh has been named the top paper by ScienceDirect’s TOP25 Hottest Articles list. The article on nanoparticle-enhanced change materials (NEPCM) with great potential for improved thermal energy storage appeared in the May 2007 International Communications in Heat and Mass Transfer. “This ranking is clearly a measure of the relevancy and novelty of the NEPCM idea as viewed by those involved in energy research,” said Khodadadi. Hosseinizadeh was a visiting professor in ME and is currently a postdoctoral fellow at the Max Planck Institute for Marine Microbiology in Bremen, Germany.

Khodadadi attended a National Science Foundation (NSF) workshop on Frontiers in Transport Phenomena Research and Education: Energy systems, Biological Systems, Security, Information Technology and Nanotechnology, held at the University of Connecticut in Storrs. He served as a member of two NSF panels that reviewed research proposals in the area of sustainable energy, and Small Business Innovation Research/Small Business Technology Transfer Program (SBIR/STTR).

Tony Overfelt was appointed a Fellow of the International Union of Pure and Applied Chemistry. In this capacity he will provide expertise to IUPAC regarding molten metals and solidification phenomena and assist IUPAC in the development of new programs in these and related areas.

Overfelt has also been appointed as one of only two U.S. regional editors of the journal High Temperatures - High Pressures. He will work to help re-build the academic journal in the area of high temperature materials, especially metals.

Aleksandr Simonian serves on the editorial board of Recent Patents on Nanotechnology. The journal, launched by Bentham Science in February 2007, publishes articles on recent patents in major areas of nanotechnology.

Simonian served as an organizer and session chair at the Electrochemical Society 2007 meeting in Chicago, where his student, Sheetal Paliwal, presented a lecture on the detection of P-Nitrophenol and P-Nitrophenyl substituent organophosphates based on fluorescence quenching. He was also a speaker at the Federal Chemical, Biological, Radiological and Nuclear (CBRN) Detection R&D Opportunities Conference in Washington D.C., where he presented a lecture on “Phage as a Reliable Probe for Specific and Selective Detection of Biothreat Agents.”

Subhash Sinha received a Fulbright Scholar Grant to teach and conduct research in Mauritius, an island located off of the coast of Africa, during the 2007-2008 academic year. He will spend ten months at the University of Mauritius as part of the grant, conducting research in rotor dynamics as well as the analysis and design of wind-sensitive structures. As part of his teaching responsibilities, Sinha will
be teaching undergraduate and graduate students in modeling, kinematics, dynamic stability and mechanical vibration while working to upgrade the school’s curriculum.

Sinha is one of approximately 800 U.S. faculty and professionals who will travel abroad through the program. The program was established in 1946 under legislation introduced by the late Senator J. William Fulbright of Arkansas to build mutual understanding between the people of the United States and the rest of the world. Administered by the U.S. Department of State’s Bureau of Educational and Cultural Affairs, the program is overseen by an appointed board that is responsible for establishing worldwide policies for the program and selection of participants.

Jeffrey Suhling served as the conference program chair for the InterPACK ’07 conference held in Vancouver, Canada, in July 2007. The flagship technical meeting of the ASME Electronic and Photonic Packaging Division, InterPACK conferences are held biannually and serve as an international forum for exchange of state-of-the art knowledge in research, development, manufacturing and application on the packaging and integration of Electronic and Photonic Systems, MEMS and NEMS. Suhling will also serve as the conference general chair for the InterPACK ’09 conference to be held in San Francisco in July 2009.

Jeffrey Suhling and Pradeep Lall recently received a three-year grant from the National Science Foundation for a project titled, "Characterization and Modeling of Aging Solder Material Behavior in Harsh Environment Electronics." According to Suhling, solders are typically used to form thousands of interconnections in modern electronic products. "Environmental concerns have motivated the use of new lead-free solders. The project will focus on understanding how the mechanical behavior of lead-free solders change with exposure to elevated temperatures and thermal cycling. Our major goals will be to develop an experimental material behavior database and models that can be used in reliability predictions," he said.

Hareesh Tippur received a three-year National Science Foundation grant to study failure of particulate composite materials. In this research he will collaborate with A.V. Phan, an associate professor of mechanical engineering at the University of South Alabama. The project, "Interactions between a propagating matrix crack and inclusions in particulate composites," deals with failure characterization of polymer-based particulate composites found in a wide range of day-to-day engineering applications, such as biocements, syntactic structural foams, solid propellants and nanocomposites. The researchers look to provide new insight into the design of novel material systems for improved thermo-mechanical integrity under shock and impact loading conditions. "My work will concentrate on understanding how rapid fracture occurs in these materials when subjected to impact loading. We intend to use laser-based diagnostic tools and ultra high-speed imaging facilities we have in my laboratory. Phan will focus on the computational aspects," said Tippur. Understanding the mechanical characteristics in general and failure properties in particular is central to the safety and reliability of structural systems which use particulate composites.

Jong Wook Hong received a three-year grant from the Marine Bio-processing Research Center (MBPRC) of Korea. The grant will be used to develop a novel biocatalyst microfluidic system for marine bio-processes. "The contract will also pick up one of Auburn University’s Detection and Food Safety Center’s preliminary patent applications and pay for the costs of the patent fees," said Hong.

Hong also received a grant from the Korean Research Institute of Bioscience and Biotechnology (KIRIBB), the largest biotechnology lab in Korea. The project will develop a novel nanoliter/picoliter fluidic array system for metabolic assessments of microbes.
Vehicle safety research

Traffic fatalities as a result of lane departures are of great concern to the Federal Highway Administration (FHWA). Currently there are passive lane detection systems, known as lane departure warning (LDW) systems which rely on cameras to track lane markings that warn the driver of unintended lane departure. However, these systems suffer from technical limitations in areas where lane markings may be missing or difficult to detect due to lighting, rain or snow. According to David Bevly, “The reliability of lane detection will become increasingly important as LDW systems evolve to systems which actively control steering to prevent unintended lane departure. Also, the reliability of vehicle positioning will become more important as map-supported safety systems, such as curve speed warning, come into use.” Bevly received a grant from FHWA to study improved vehicle positioning using inertial sensors combined with high accuracy NDGPS system intelligent multi-sensor measurements for vehicle navigation and control systems.

Today’s vehicles have a wide range of on-board sensors such as GPS for navigation, radar or lidar for Adaptive Cruise Control (ACC), cameras for LDW systems, inertial sensors (such as accelerometers, gyroscopes and wheel speed sensors) for vehicle control systems (including electronic stability control). “However, rarely are these sensors integrated together in an intelligent fashion,” said Bevly. The proposed research will examine the safety improvements possible by fusing sensor signals from several systems expected to be available on passenger cars in the near future. The research will investigate the merits of an integrated sensor fusion approach of systems that could be available in the near future.

Graduate student David Hodo will be working on the project, using cameras, lidars, GPS and inertial sensors to detect and monitor lane position for future highway safety systems. The end product, according to Bevly, will be an accurate, robust and reliable vehicle positioning system capable of providing high-update-rate lane-level measurements for future vehicle navigation and safety systems.

AU marching band led by ME

When the trio of drum majors run out on to the football field at Jordan Hare Stadium, it’s the first indication that the game is about to begin. This year, the lead drum major of the Auburn University Marching Band (AUMB) who performed the traditional pre-game ‘high step’ on the field was ME senior Bryan Myers.

Myers, a 2004 graduate of Mountain Brook High School, has been part of AUMB since he enrolled in Auburn. Myers completed his fourth year with the band, and his second as a drum major, his first as a lead drum major.

“It was a difficult process, but one that really allowed me to show some of my strongest attributes as a leader,” said Myers. “The two assistant drum majors, John Warner and Nick Smith, are more than capable of stepping in if I cannot complete my game-day responsibilities.”

The band rehearses every day during the week for about an hour a day and for a few hours on Saturdays before each game. Although AUMB practices occupy a lot of his time, Myers still finds time to study and be an active member of numerous extra curricular organizations. He was a member of the Cupola Society until 2006 and stays involved by working in the dean’s office. He is currently a member of Omicron Delta Kappa, Mortar Board and Spade Honorary, and serves as the president of his social fraternity.

“Being part of the AUMB was a great opportunity to meet and work with people who love Auburn and love performing music. I feel it’s one the most rewarding ways to give back to Auburn and the Auburn family as a student.” His most memorable
moment came when he traveled with the band to Washington D.C. for the president’s inauguration. “I will never forget that once-in-a-lifetime experience. It was awesome to see President Bush say ‘War Eagle’ as we marched by him during the parade.”

Myers, who will graduate in August 2008, hopes to pursue a career in the design and construction industry and work toward a PE certification.

Auburn University began in 1856 as East Alabama Male College. In 1872, the college became the first land-grant college in the South to be created separate from a state university. The name was changed to Agricultural and Mechanical College of Alabama. Along with state funds came the mandate that exercises in “military tactics” be taught to all able students.

In the early years, these military exercises were accompanied by a drum corps consisting of twelve cadets. In 1897 it occurred to M. Thomas Fullan, an instructor of mechanical arts (now mechanical engineering), that an instrumental band would be an improvement. Fullan met with then-president William Broun and suggested making the corps into a college band. With funds from the entire student body, local business donations and gifts from faculty members, instruments were ordered and regular band practice began. While waiting for the instruments to arrive by express delivery, the band relied on a core of instruments including an old brass tenor horn dubbed “Jenny Lind.” Thus the Auburn University Bands trace their beginning to 1897, director M. Thomas Fullan, a tenor horn named “Jenny Lind,” and a single bass drum.

A novel introduction to engineering

Auburn’s Aquatic Center played host to a different kind of activity in spring 2007. Swimming competitions were not on the program. Instead, the pool became a venue for a host of boats made from a variety of materials such as Styrofoam, fiberglass, foam noodles, plywood and two-liter bottles. The participants were ENGR 1110 students testing their projects they had built for the class. “The objective of the class was to introduce students to the skills they needed to study mechanical engineering,” said Joseph McIntyre, instructor for ENGR 1110.

“The six-pack-ship project was a team effort,” said McIntyre. The project required the boats to deliver a minimum of 24 full beverage cans across the pool in ten minutes. The boats had to travel 25 meters loaded with cans and return empty on just one fueling. Out of 21 groups, 20 completed delivering the 24 cans in ten minutes. “We did not have any boats sink,” said McIntyre. The winning team composed of Casey Johnson, Scott Shields, Richard Tatum and Matthew Tuberville, delivered 480 cans in ten minutes.

“Part of the challenge for the students is to learn the skills needed to construct the design they have made,” said McIntyre. “We introduce students to what mechanical engineers do and to the skills they need to be successful ME students.” Students are introduced to engineering through case studies and historic achievements of engineers and engineering design.
Featuring...

Jordan Roberts, a graduate student working with Jeffrey Suhling, won the outstanding poster award at the InterPACK ‘07 conference in Vancouver, Canada.

The poster, "Die stress variation during thermal cycling reliability tests," is the result of a research effort to characterize stress levels in integrated circuit (IC) chips subjected to various cyclical thermal loadings. The work was based on three distinct studies carried out over a period of two to three years by Roberts and Kaysar Rahim, a postdoctoral fellow in the department. “A first for this work was the in-situ measurement of stresses during extended thermal cycling. The research enabled us to correlate stress levels in IC electronic packages to mechanical failure, as well as establish how stress levels change as a result of thermal cycling,” said Roberts. The main focus of Roberts’ research is experimental characterization of stresses in electronics packages. Development of reliability tests, finite element verification of experimental results and materials characterization are also part of his research endeavor.

“The poster session allowed me to meet other graduate students from around the world and get a better picture of current research in my field—electronics packaging. It opened my eyes to new opportunities and re-energized my research.”

A Sardis City, Ala. native, Roberts received his undergraduate degree from UAB in 2003. He began graduate study in Auburn in 2004 and is associated with the Center for Advanced Vehicle Electronics. In addition to being a research assistant, Roberts has been teaching Computer Aided Engineering since fall 2004. Upon completion of his thesis, Roberts will begin his doctoral work under Suhling.

Training students for the global economy

In 2006, the Committee for Economic Development (CED), a nonprofit group for business and academic leaders, noted that demand for graduates with strong international skills was outstripping supply. The CED urged educational institutions to provide the necessary training to prepare students for active engagement in the international community. Universities are now giving global perspective and international experience a new meaning. In step with AU’s commitment to prepare students for a “Flat World”, students will be participating in a U.S.-India International Research Program, through the Laboratory for Innovative Technology and Engineering Education (LITEE) gateway. In summer 2008, the program—open to U.S. citizens who are graduate students or senior undergraduates with plans to join the graduate program in engineering—will introduce them to the challenges of working in the international marketplace.

After developing case studies for U.S. companies, P.K. Raju and Chetan S. Sankar (College of Business) have expanded their program to provide American students an international experience. The students will receive an engineering-related experience in India. According to Raju, case studies are more like independent studies, where the students work in an area identified by LITEE’s Indian partners. “One of our case studies was to identify whether wireless or wired interfaces were suited for communication between remote areas and
the project headquarters.”

In another study involving an accident in a textile industry, students had to learn the legal implications of the accident, and learn about codes and standards and lock-out procedures. "While in India, students will work with students and faculty at the Indian Institute of Technology Madras (IITM) and with industry managers at Larsen & Toubro Limited, BHEL (Bharat Heavy Electricals Limited) and GE," said Raju. A National Science Foundation grant pays students for air travel, boarding and lodging.

For students Bobby Dixon Jr. (Computer Engineering) and Michael Fuller (Computer Science), travel to India was different from the life they were used to. The cultural experience and the exposure to the international marketplace was the vital part of the program. “In a world that sees increasing international commerce, a semester abroad should become a necessary part of the curriculum,” said Fuller. An Indian ME graduate student, Pramod Rajan, helped them in their acculturation. LITEE is currently training the next group of five students who will travel to India in 2008.

### Salary data for engineering graduates

Students add value to design

In January 2007, at the beginning of Comprehensive Design I, ten seniors made a trip to Ooltewah, Tenn., to visit Miller Industries, the world’s leader in the towing industry. The company wanted to reach a new level in their towing operation. John Hawkins, head of sales at Miller, expressed the company’s interest in a new outrigger design for its heavy duty rotator series tow trucks.
Tow trucks depend on outriggers for stability. The rear outriggers extend from the truck and help stabilize it while the stage boom is being used in recovery operations. When a load is passed over the rear corner, the outriggers are loaded at their maximum. Miller wanted the team to design an outrigger that would provide a more stable platform by having the outriggers extend further. This presented the design team with many challenges. The stress in the outriggers is increased yet Miller wanted the outriggers to be no wider and to cost no more. When not in use, the outriggers are retracted and stored in a small area behind the rear tires. Each Miller truck is currently outfitted with four outriggers, two in front and two in the rear. The design team had to provide a rear outrigger design that would meet all Miller Industries’ needs. Students that worked on the project were Tyler Frey, Dustin Hall, Scott Johnson, Scott McClure, Adam Nicholson, James Potter, John Plexico, Jerrod Weaver, Kaki Wright and Brian Zorbini. David Dyer, head of the department, guided their effort, and the team received additional support from Robert Engles, graduate teaching assistant in the department.

The final design had to comply with federal regulations, where the outrigger design could not extend beyond 96 inches in width when mobile; the maximum allowed gross weight of the truck was 80,000 lbs; the maximum gross weight on any one axle had to stay within 20,000 lbs; the maximum gross weight on any tandem axle was 34,000 lbs. Miller wanted a new design that would increase overall stability of the truck, while also increasing the truck’s lifting capacity, with minimal cost inflation.

After the design was cleared by Miller, the outriggers were built and tested at their facilities. In seven months, the students had come up with a concept, developed a design, manufactured and placed the final product on a truck, and set it for sale. Miller Industries has received several orders to retrofit existing trucks and plan to add the rear outriggers as standard equipment on all their new trucks.

**O’Neal Austin Best Students - Spring 07**

At a recent luncheon, the following students received the O’Neal Austin Best Student awards for outstanding performance in a course taken in spring 2007. Each of these students was presented with an AU Bookstore gift card and a certificate.

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<td>Christopher Duron</td>
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Jared Deerman was named the first recipient of the O’Neal Austin Scholarship this year. The Alabama native graduated from Clay-Chalkville High School in 2004 and hopes to graduate with a bachelor’s degree in Mechanical Engineering in August 2008.

Deerman is a member of Pi Tau Sigma, Tau Beta Pi and Phi Eta Sigma honor societies. After graduation, he plans to work in the area of research and design or product development. He is also considering pursuing an MBA degree.

His most memorable time in Auburn? “Definitely Auburn defeating Alabama in football every year I was here at Auburn.”

**AU’s Baja SAE team wins national championship**

The Auburn Baja SAE team won its first victory since 1977, placing first overall out of a field of 100 cars at the Baja SAE South Dakota competition, May 23-26 in Rapid City. As the only American winner of a 2007 Baja competition (other competitions were won by teams from Canada and Brazil, respectively), the team claims the national title. “Our team used the sum of our knowledge to design and build a great car, and then stayed on top of every detail to get the greatest performance out of it,” said Peter Jones, the team’s faculty advisor.

The South Dakota competition followed the event schedule of the old ‘Mini Baja West’ competition, which Auburn rarely visits. A rock crawl was substituted for the more familiar water maneuverability event, and static events included presentation, in which the design is pitched to potential investors. “Facing a partially unfamiliar event schedule and still bringing home the victory is evidence of the team’s focus and flexibility,” said Jones. After a slow start in the first day’s static events (20th place for the combination of Design, Cost and Presentation), Auburn performed with steady consistency in the second day’s short dynamics events. Auburn placed second in land maneuverability, fifth in rock crawl, sixth in hill climb, and eighth in acceleration. This put Auburn close enough to the lead that a fifth place in the third day’s endurance race was enough to bring home the overall title.
Auburn won with 855.28 points out of 1,000, closely followed by Oregon State (Orange) (the defending champion, with 848.14), SUNY Stony Brook (839.79), South Florida (839.71) and Oregon State (Black) (831.27). “Several of the traditionally top Baja schools ran into problems on the tough endurance course, such as the host, South Dakota School of Mines & Technology, Illinois, Iowa, Michigan State, UCLA, Purdue and Georgia Tech,” said Jones. The international field included teams from the United States (82 cars), Canada (7), Mexico (6), South Korea (3), France (1), and South Africa (1). “The team knew what it had to do, and they had the skill and the background to go out and do it,” said Jones.

**Another victory for the Baja Team**

The AU Baja SAE team won first place in the Dayton Invitational and took home a $500 prize. The early season event was sponsored by the Dayton Section of the Society of Automotive Engineers, September 29 in East Liberty, Ohio. The event was a three-hour endurance race on the ATV testing track at the Transportation Research Center near Columbus.

According to Peter Jones, the team’s faculty advisor, in addition to attaining its competitive objectives, Auburn also accomplished its testing objectives (fuel consumption trials) and training objectives (race experience for four new endurance drivers and pit-stop and breakdown experience for a new pit crew). “The team studied methods for ensuring driver’s visibility under conditions of uniformly-broadcast liquid mud films,” said Jones, commenting on the effects of two expertly-designed water hazards. Twenty-one teams competed in the event, including teams from Michigan State, Ohio State, Kansas State and Illinois.

**ME student wins national award**

While the Baja team saw several victories this year, one of its former members has received some special recognition of his own.

Darrell Krueger, who graduated in 2005 with his undergraduate degree and in 2007 with a master’s degree in mechanical engineering, was awarded the Society of Automotive Engineers (SAE) 2007 Rumbaugh Outstanding Student Leader Award, the highest honor SAE gives to a student.

“Darrell is one of those rare Baja engineers who really sees the potential for great automotive science and has worked tirelessly to contribute to that science,” says SAE advisor Peter Jones. “He is a magnificently imaginative, hands-on kind of an engineer, and he really appreciates what the Baja program has done to focus and structure his education.”
The award was established in 2002 by Max E. Rumbaugh, Jr., past executive vice president of SAE, to identify and recognize outstanding student leaders and encourage a vision within the recipient to become an SAE leader during his or her adult career. Through Rumbaugh’s generous contribution to the SAE Foundation, Krueger will receive a lifetime adult membership in SAE, a trip to the 2008 World Congress to receive the award, an honorarium, and invitations to attend other SAE functions. Krueger will be recognized during the awards ceremony at the SAE 2008 World Congress, April 14-17 in Detroit, Mich.

“December’s graduation certainly doesn’t mark the end of my involvement with Baja,” Krueger says. “Since my last year with the Auburn team as a senior, I helped organize the 2006 race here at Auburn, and today I am part of the national inspection team for Baja SAE, traveling to all of the Baja events.”

**Formula SAE returns triumphant**

Auburn’s Formula SAE team placed third overall in the FSAE-West Competition, June 13-16 in Fontana, Calif. Strong performances in the Design (second place) and Endurance (fourth place) event made Auburn stand out in a field limited to 80 entrants. The third place is Auburn’s best-ever overall finish in FSAE-West, and ties the team’s best finish (in 2004) at the 140-entrant FSAE-Michigan Competition. Now in its second year and initiated to satisfy excess demand from FSAE-Michigan, FSAE-West attracted teams from 26 states, plus cars from Brazil, Canada, China, India, Italy, Japan, Mexico, Puerto Rico, South Korea, Sweden, United Kingdom and Venezuela.

“We were lucky to make it there,” said Jason Pennington, 2007 ME graduate and FSAE Powertrain Group Leader (now employed at the Amerada Hess refinery in St. Croix). “We had a very damaging accident in training between Michigan and West and had to rebuild about 25 percent of the frame and suspension. But that gave us the chance to clean up our appearance, and I think the design judges liked that,” noted Pennington. “In Michigan, we had trouble in both design and endurance, and so to go out to California and turn in a great performance based on those two events says a lot about the character of the team,” said team advisor Peter Jones.

The team now turns its attention to the design of the 2008 car. The team will be led by Ben Steele (captain), Erin McMullin (chief engineer) and Jeffrey Cobb (powertrain group). Plans call for a switch from the four cylinder engine model in use since the team’s inception in 1996 to a slightly less powerful twin that weighs about half as much. “Look for Auburn’s 2008 car to be a little out of the ordinary,” said Jones.

**AU transit system goes green**

Auburn University’s orange and blue Tiger Transit buses are now green. The transit fleet of more than 40 vehicles has made the switch from using regular diesel fuel to biodiesel, a cleaner burning alternative fuel produced from domestic, renewable resources. Auburn is the first university in the state to make the switch.
"Auburn’s leadership on alternative sources of energy starts on campus," said AU President Jay Gogue. "Tiger Transit’s switch to biodiesel illustrates our commitment to improving energy security for the United States and promoting economic growth through development and use of renewable bioenergy."

The switch comes at a time when ridership is at an all-time high - with a one-day record the first week of classes of more than 17,000 riders - and when more than 5,000 users a day are using new visualization technology to check the internet or their cell phones to see exactly when their bus will arrive.

Known as the Transit Visualization System, the technology allows students to view the buses in motion and the routes in real time on a detailed map displayed on the internet or a web-enabled cellular phone. Each of the Tiger Transit buses is outfitted with a GPS unit that relays its location to a central server. The server then transmits the location to a map on the internet or cell phone, all in three to five seconds time.

"It keeps students from having to stand out in the rain or wait for the bus in bad weather," said Rex Huffman, manager of transit services at AU. "It also assists management with seeing where the buses are and how the drivers are operating on their routes."

The map also has a section where Huffman and other administrators can post announcements, for example alerting students when a bus is out of commission or telling them of a route change. The announcements feature could also be used to quickly disseminate a message to students regarding inclement weather or a campus emergency, Huffman said.

Tiger Transit continues to see an increase in the number of riders that utilize the service. Three years ago, the system was operating 17 buses and today it has a total of 41 buses. Currently, the transit system averages 50,000 riders a week and 200,000-210,000 riders a month.
In Memoriam

William F. Walker, former professor, dean and provost who served as AU’s president from 2001-04, died August 7 of complications from cancer. He was 69.

William Walker grew up in Sherman, Texas, and earned his bachelor’s and master’s degrees from the University of Texas at Austin in aerospace engineering. He received his doctoral degree from Oklahoma State University in mechanical engineering. Before coming to Auburn, Walker served as dean of engineering and professor at Rice University, where he was a faculty member from 1965-88. He served as chair of the department of mechanical engineering and materials science for nine years. Walker came to Auburn in 1988 as dean of the College of Engineering. Eleven years later, he was promoted to provost and was then named interim president in 2001, succeeding William Muse. He was elevated to president in June 2002 and served in that capacity until January 2004.

“Bill Walker laid an incredible foundation that resulted in Auburn's move into a new era of excellence that we continue to build on today,” said Dean Larry Benefield. The renovation of Ross Hall and Wilmore Laboratories were started when he was dean. He initiated the $500 million “It Begins at Auburn” campaign and provided the leadership needed to begin several construction efforts to improve campus. As AU president, Walker led efforts to ensure the university’s financial soundness, focus its sense of mission and accountability and improve communications among faculty, staff, students, alumni and the Board of Trustees.

John L. Scarborough, 87, of Cincinnati, Ohio, died August 15 at his daughter’s home in Cincinnati. A burial with military honors was held in Birmingham. Memorial services were also held at the First Baptist Church in Auburn. Scarborough was born in Birmingham to the late John L. and Catherine (Price) Scarborough, and was brother of the late Mildred Magill. He was married to the late Peggy Scarborough (nee Grimes), and was the father of Connie Scarborough (Charles Tepe).

A retired professor of mechanical engineering at Auburn University, Scarborough graduated from Auburn with a bachelor’s degree in aerospace engineering in 1943 and a master’s degree in mechanical engineering in 1950. Before he obtained his master’s degree, Scarborough served as a captain in the Army Air Corps during World War II. He also received a master’s degree from the University of Alabama. He retired from the department in 1985, but continued to teach as an emeritus professor.

Ron Evans, development officer in the Sam Ginn College of Engineering, remembers Scarborough vividly. “Scarborough taught us the power plants course. He was famous for the wild stories he would tell in class. He advised us that it was not good enough to design something a new way or of better quality. It also had to be a cost saving design or you could never get anyone to seriously consider it. He had experienced that himself the hard way, and gave it to us as a word to the wise.”
Pursuing the vision for Auburn Engineering

Achieving our vision to become one of the top engineering programs in the country is always in our sights, and the college has set an ambitious vision goal of raising $153.5 million that will move Auburn Engineering to the next level of excellence. Our generous alumni and supporters continue to play a vital role in our pursuit of these efforts, even as we have met our goal in the "It Begins at Auburn" campaign.

Reaching this vision goal will provide benefits that can be seen in a number of outcomes. For example, your gift will fund professorships, which are critical for attracting talented faculty capable of attracting high level research funding. They will also support scholarships that help us recruit the best and brightest students, as well as fellowships, which enable us to attract exceptional graduate students.

Help this generation of students realize their potential. Your support has never been more important as the college works to maintain its competitive edge. For more information on giving to the Samuel Ginn College of Engineering, visit www.eng.auburn.edu/givenow/.

The ME Newsletter is published by the Department of Mechanical Engineering. Mailing and e-mail address changes, news items and suggestions should be sent to Latha Bhavnani, 201 Ross Hall, Auburn, AL 36849-5341 or Bhavni@auburn.edu.

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