Name change reflects direction of industry

To better reflect the subject matter and research in our department as well as the career opportunities available to our alumni, the Department of Textile Engineering petitioned the university to change the name of the department and the engineering curriculum to polymer and fiber engineering.

The requests have been reviewed and approved by the engineering and university curriculum committees, AU's Board of Trustees, and the Alabama Commission on Higher Education.

Polymer and fiber engineering course work has been rewritten by the faculty, and new faculty will be hired to teach and perform research in polymers. Courses focus on the development of engineered materials including polymers, fibers, composites, nanomaterials, and biomedical materials. The new curriculum will go into effect fall semester 2006.

Polymers and fibers are utilized in such diverse fields as plastics, elastomers (rubber), adhesives, surface coatings (paints), paper, packaging,
insulation, filtration, composites, biomedical, automotive, aerospace, marine, construction, environmental, industrial, nonwoven, recreational, and safety materials. Graduates work in a variety of areas including research and development, product development, process engineering, composite engineering, quality engineering, industrial engineering, operations, and technical sales.

"We traditionally hire mechanical engineers and chemists. Your curriculum bridges the gap between them,” says Joe Bonk, manager of southeast sales and distribution with Zyvax, Inc., which develops slipcoats and mold release systems for aerospace, marine, and other industries. "The new curriculum is a very useful background for them."

Faculty awarded for green chemistry technology

Roy Broughton, professor in polymer and fiber engineering, received a Presidential Green Challenge Award for technology developed in collaboration with researchers at the University of Alabama.

The research team, led by Distinguished University Research Professor of Chemistry Robin Rogers, director of UA's Center for Green Manufacturing and adjunct faculty in Auburn’s Department of Polymer and Fiber Engineering, has discovered that certain chemicals, known as ionic liquids, will dissolve plant matter (cellulose). The new solvents are water soluble, nonvolatile, nonflammable and relatively nontoxic materials.

Broughton and his students have been making fibers and films while developing this new technology. Rogers explains that the process opens the door for future development of cellulose-based fibers and plastics that could be used instead of petroleum-based plastics in products ranging from automobiles to fibers.

The researchers aim to develop more effective and environmentally friendly ways to convert plants into fibers and plastics — a technology they hope will provide a viable alternative to Alabama’s declining fiber and paper industries, and decrease the nation’s dependence on foreign oil.

The Presidential Green Chemistry Challenge Awards Program, sponsored by the U.S. Environmental Protection Agency, is an opportunity for individuals, groups, and organizations to compete for annual awards in recognition of innovations in cleaner, cheaper, smarter chemistry. It provides national recognition of outstanding chemical technologies that incorporate the principles of green chemistry into chemical design, manufacture, and use, and have been or can be utilized by industry in achieving pollution prevention goals.

Department achieves ABET accreditation

In November 2004, the College of Engineering was reviewed under the new Accreditation Board for Engineering and Technology (ABET) rules (EC-2000). Our fiber engineering degree was accredited for two years, and our polymer and fiber engineering degree will be reviewed for accreditation.
Alumnus **Major** honored as outstanding

David Major of Alexander City was named Outstanding Alumnus 2005 by the Department of Polymer and Fiber Engineering.

Director of manufacturing for Frontier Yarns in Wetumpka, Ala., Major received his bachelor’s degree in textile management from Auburn in 1972 and a master’s degree in textile technology from the Institute of Textile Technology in 1974.

He rose through the ranks with Russell Corporation in Alexander City from entry level to plant manager and vice president of yarn manufacturing. In 2002, Major was named to his current position with Frontier, a yarn supplier to Russell. He is active in Manufacture Alabama, past president of the Textile Council, and is a trustee and past president of the Alabama Textile Education Foundation.

**New breed of stent is part of biomedical research**

Sabit Adanur, professor in polymer and fiber engineering, is in year two of what is expected to be a three-year project to develop a polyester stent. Like a metal stent, its polyester counterpart would work as an expandable tube often used to keep clogged arteries open in the heart.

The polyester stent, which has already drawn the interest of a private California-based company, will be less expensive and more durable, flexible and effective than those presently used in hospitals.

Funded by the National Textile Center, Adanur must show sufficient progress in order to be funded for the final year, in which he expects the stent to be tested in animals and, in the future, hopes to see it licensed for commercialization.

**Composites One holds course on campus**

Composites One, the leading distributor of composite materials in North America, recently conducted a two-day composites “boot camp” on the Auburn campus for industry professionals.

Participants attended lectures, demonstrations, and training sessions on closed mold and light resin transfer molding technologies and applications, vacuum infusion processes, and closed cavity bag molding. These technologies make more consistent parts with less waste and fewer emissions.

Composites One recently sponsored Auburn polymer and fiber engineering lab technicians David Clark and Jeff Thompson at its Lite RTM Closed

Sabit Adanur of the polymer and fiber engineering faculty demonstrates the production of a polyester stent he is developing in conjunction with the National Textile Center.
Molding short course in composite tooling in Vanastra, Ontario, Canada. Clark and Thompson are also scheduled for a vacuum infusion short course. The courses are part of a certification process for composite technicians.

Department receives homeland security grant

The Department of Polymer and Fiber Engineering, in cooperation with the College of Sciences and Mathematics’ Department of Chemistry, received a three-year, $1.5 million research grant — among the first awarded by the Department of Homeland Security and the first awarded to Auburn University — to study potential barrier materials against biological and chemical threats.

Researchers will develop an active protection strategy to stop chemical agents before they reach the skin. If successful, the materials will provide protection without compromising comfort, allowing rescuers to wear protective garments for prolonged periods.

Auburn is the lead institution working with Clemson University and NovaComp, Inc., a specialized company in Philadelphia. Auburn’s research team includes Yasser Gowayed, primary investigator; Gisela Buschle-Diller and Peter Schwartz of the polymer and fiber engineering faculty, and Peter Livant of the chemistry faculty.
Ballistics research being tested by military

The Army’s Air Warrior unit, consisting mainly of helicopter pilots, has been conducting field tests on polymer and fiber engineering faculty member Howard Thomas’s patented ballistics protection technology, ArmorFelt, for the past several months and has new funds to continue research.

Thomas says preliminary tests confirm that ArmorFelt can stop blasts as close as three feet from a wide range of weapons, including a 9mm rifle, a 9mm pistol and a .357-caliber Magnum revolver. According to Thomas, ArmorFelt passed with flying colors, actually above the Army’s standard, and ballistics performance of the bullet-proof vest used in the testing is far above what the Army currently uses in the field.

Thomas asserts that ArmorFelt, which is designed to be worn beneath hard body armor, is superior to any bullet-resistant vest on the market, and its potential in the military, police force and homeland security can expand to lining tents, buildings and military vehicles to provide protection from small arms and shrapnel.

Howard Thomas, Auburn polymer and fiber engineering faculty member, shoots and removes a bullet from ArmorFelt, a bullet-resistant material he developed that is more resistant, lighter, and more comfortable than material currently in use.
As part of its summer camp program, the Civil Air Patrol works with Auburn polymer and fiber engineering to offer E-Tech Camp to youth. Cadets spend a week on the Auburn campus learning about the world of engineering.

In July, the department hosted the fourth Civil Air Patrol E-Tech Camp — the pilot program of the Patrol’s national summer camp program. The cadets spent a week on campus to investigate engineering as a career, participating in hands-on activities with engineered aerospace composite materials and lab activities in several engineering departments. One of their sessions included taking the nearly complete hovercraft out for testing.

In polymer and fiber engineering, the cadets shaped air foils from foam blocks, did a hand lay-up of carbon fibers, used a vacuum bag process for resin saturation of the fibers, and learned how fiber structure and placement affects performance in a composite material. After completing the air foils, the cadets used aerospace engineering’s smoke tunnels to determine the air flow around different air foil shapes.

Also in July, the College of Engineering hosted its second annual TIGERs (Teams and Individuals Guided by Engineering Resources) Camp for seventh and eighth grade students. Polymer and fiber faculty member Gisela Buschle-Diller conducted a forensics game lab activity. To solve a crime, student teams tested fibers and polymers with microscopic examination, performed ID stains, burn tests, density tests, and conducted chromatography of ink.

Programs educate youth about engineering
Study abroad with university in Germany a success

The department’s student exchange program with Reutlingen University in Germany is a resounding success. The study abroad experience has been so valuable to our students that we are seeking companies or alumni interested in funding a study abroad scholarship to enable more of our students to participate. Many would like to go, but are dissuaded by the increased travel and required insurance costs.

If you or your company are interested in helping to fund such a scholarship, please contact Julia Freeman at 334.844.5457 or julia.freeman@auburn.edu.

Alumni survey needs greater engineer response

Engineering needs input from alumni who graduated from AU with a bachelor’s degree in textile or fiber engineering, but response to the department’s online survey has been low.

“This information is critical for ABET accreditation, which keeps our students competitive with students from Georgia Tech and N.C. State that have accredited engineering degrees in our field,” says Peter Schwartz, polymer and fiber engineering department head. “In addition, graduating from an accredited engineering program is required if the student wishes to take the examinations to become licensed as a professional engineer.”

Engineering alumni — please visit www.eng.auburn.edu/pfe and click on “Online Graduate Survey” under Announcements.

Lambda chapter to host Phi Psi convention

AU’s Lambda chapter of Phi Psi Honorary Fraternity will host the 99th national convention in Huntsville March 16-18. For information, registration, corporate sponsorship or donations, please contact Julia Freeman at julia.freeman@auburn.edu.
Student achievements

Research awards

Two Auburn doctoral candidates received awards for their posters at the 2005 AU Graduate Student Research Forum. Sherif Abuelenin won first place for his poster on magnetic ring spinning. Swagat Irsale placed third for his poster “Exploring Textile Stents: Prototyping and Modeling.”

A recent doctoral graduate in integrated textile and apparel science, Dong Lee won second place in the campus National Textile Center student competition for his presentation on “Nesting Effects on Opening-Mode Fracture Behavior of Textile Laminates.” Lee investigated nesting in carbon/epoxy fabric-reinforced composites and how it affects fracture toughness of the materials.

Who’s Who

For the third time in four years, one or more polymer and fiber engineering seniors has been chosen as one of AU’s top 100 students — Who’s Who at Auburn University. Students are chosen on the basis of academics, activities and leadership.

Mellany George, a recent fiber engineering graduate from Birmingham, and Erin Pugh, a graduating senior in fiber engineering from Sylacauga, Ala., were chosen for 2005. Mellany’s twin sister Melody was among the top 100 honored in 2004.

Student spotlight

The College of Engineering’s online student spotlight at www.eng.auburn.edu/students/student-spotlight.html shines on recent fiber engineering graduates Mellany and Melody George …

Twins find their niche in fiber engineering

When first searching for a college to attend, identical twins Melody and Mellany George from Birmingham didn’t consider Auburn as one of their top choices. But Auburn offered them the most incentives, and there was something about it here that they liked.

“When we first came here, we thought we might transfer to another school in a year or two,” remembers Mellany. “But after spending some time at Auburn, we were too attached to leave.”

December ’05 fiber engineering graduates, the sisters agree their Auburn Engineering experience gave them more than they had hoped for — including twin scholarships from the National Science Foundation (NSF) and being named NASA Space Grant Scholars.

“We have many friends here,” says Melody, “including our professors, classmates, and advisor. We love it here. We know our professors so well, and Auburn’s fiber engineering curriculum is so strong, that I think our professors were able to write powerful recommendation letters for us when applying for the NSF scholarship. It makes it mean more.”
The sisters’ fascination with engineering began in high school, where they were members of Future Engineers of America and Boy Scouts Explorers Club of America. By the time they came to Auburn, their appetite for engineering had been fed with leadership activities from building and testing bridges out of drinking straws to, quite literally, rocket science. They also toured Birmingham area plants and factories.

“We gained many different interests from our experiences,” says Mellany. “We chose fiber engineering as a major because it has such a variety of applications.”

Adds Melody, "It's full of innovative ideas. Everyone is looking for lighter yet stronger, more rugged materials to make things from, ranging from airplanes to bullet-proof vests."

Both students have built on their education with internships at Southern Nuclear in Dothan, Ala. and the Department of Defense in Washington, D.C., where they worked in plastic and textile engineering.

They are now in the master's program in materials engineering at the University of Alabama in Birmingham, and hope to pursue a career including research in new fiber applications, advanced polymers and making composite structures with a combination of fibers and metals.

"We're excited to see what our future in engineering will bring," says Mellany. "It's been great so far."

Student awards

The spring 2005 student awards, voted on by faculty, were presented at the ATEF dinner on the Auburn campus in March ...

Outstanding seniors '04-'05 — Mellany and Melody George, December '05 fiber engineering graduates from Birmingham.

2005 Phi Psi Senior Honor Award — Tiffany Bates from Clanton, Ala., and Tara Richardson from Decatur, Ala. Richardson is a process engineer with GKN Aerospace in Tallassee, Ala.; Bates is a process engineer with Milliken in LaGrange, Ga.

Chattahoochee Valley Phi Psi Alumni Award — Vicki Mando from Daleville, Ala. and Jennie Williams of Anderson, Ala. Fiber engineering graduate Mando is a research engineer with the U.S. Army Aeromedical Research Lab at Fort Rucker, Ala. A textile management and technology major, Williams works with Knight Transportation in Atlanta.

Textile Operating Executives Award — Contessia Cook from Ashville, Ala. and Toccara Hunter from Lineville, Ala. Both fiber engineering grads, Cook is a math teacher and Hunter is an industrial engineer with Russell Corporation.

'04-'05 W. Kenneth Lynch Merit Award and Scholarship — Christy Cunningham, a senior in fiber engineering from Selma, Ala., is a process engineer with GKN Aerospace in Tallassee, Ala.
Larry Benefield, dean of engineering, presents Katie Hudson, a fiber engineering senior from Muscle Shoals, Ala., with the 2004-05 Outstanding Student Award during a reception on the Auburn campus last spring. Hudson has interned with U.S. Customs Laboratory in Savannah and V2 Composites, Inc. in Auburn and has accepted an engineering position with GKN Aerospace in Tallassee, Ala.

'05-'06 Lynch Scholar — Rebecca Anthony, a fiber engineering major from Rome, Ga.

Christopher B. Terry Service Award — Tara Richardson

American Association of Textile Chemists and Colorists Senior Award — Jared Cooper from Hoover, Ala., is in the biomedical engineering graduate program at the University of Memphis, a joint program with the University of Tennessee.

Phi Psi Freshman Scholarship Award — sophomore fiber engineering majors Josh Martin from Enterprise, Ala. and Nathan Smith from Huntsville.

Gisela Buschle-Diller (right), polymer and fiber engineering associate professor, is awarded the 2005 William F. Walker Merit Teaching Award for Excellence by Walker, retired mechanical engineering faculty member and former university president, during the Dean’s Award Reception in May. Selected from college-wide nominations, the Walker Teaching Award is endowed by Mr. and Mrs. Fred Birdsong Sr.
E-mail job announcements popular with alumni

While Julia Freeman, academic program assistant, occasionally sends late-breaking AU news of interest to alumni who provide their e-mail address, many of our graduates also receive job announcements whenever the department is contacted by companies or professional recruiters.

If you would like to receive news or news plus job announcements, please e-mail your request to julia.freeman@auburn.edu. Alumni who are job hunting should also register with Career Services at www.auburn.edu/career/alumni.

The Formula 25 Hovercraft Team has completed its first hovercraft. The team, comprised of students from several engineering disciplines, primarily fiber and mechanical, is planning to build a second craft, having learned a lot from the first.
Polymer and fiber engineering graduate students Rebecca Ray from Nashville (center) and Rosary Stephen from San Diego (right) conduct a polymer “slime” activity for students attending Auburn Engineering’s E-Day 2006, an open house held annually on the Auburn campus to introduce potential students and their families to the college’s programs. The new polymer and fiber engineering banners were donated by Highland Industries in Greensboro, N.C., whose president, Frank Roe, is a ’69 Auburn textile management graduate.