

Polymer and Fiber Engineering

WHAT IS POLYMER AND FIBER ENGINEERING?

Among the 20th century's greatest engineering achievements and advances in technology are developments made towards understanding and improving the structure, properties and performance of polymeric materials, as well as their environmental relationships. Polymers are used as structural materials in cell phones, iPods, computers and cars, as well components of watercraft, aircraft and high-performance sports equipment, such as skis, snowboards, tennis racquets, golf clubs and bicycles. But advanced materials such as engineered polymers and fibers are also much more; they are saving lives in biomedical materials used to make arterial stents, heart valves and artificial joints, as well as in regenerating organs.

NOTABLE

- 63 undergraduate and 16 graduate students enrolled in fall 2014
- 7 full-time faculty members
- Established as the Department of Textile Engineering in 1929 — the name and curriculum were changed in 2005
- The department offers an academic exchange program in Germany through partnerships with the University of Applied Sciences in Reutlingen and the Technical University of Dresden; exchange programs with universities in China are being added
- PFE offers a comprehensive curriculum in polymer and fiber engineering and the first of its kind in the state, including master's degrees since 2006 as well as a doctorate, which was added in 2010
- State of the art equipment is available for contract testing and joint research projects on or off campus

CURRICULUM

Bachelor of Polymer and Fiber Engineering

Auburn's polymer and fiber engineering curriculum stresses the fundamentals of engineering, behavior of polymeric materials, polymer processing and fiber reinforced polymer composite materials.

Fiber Option

The fiber option focuses on the engineering of fibrous structures and the mechanics of flexible structures. The curriculum includes coursework in fiber-reinforced materials, engineered fibrous structures, protective materials and the fundamentals of polymers.

Polymer Option

Polymers include both man-made materials, such as polypropylene, and biological materials such as proteins and polysaccharides. With a strong basis in chemistry, the polymer option includes the processing and characterization of polymers, as well as polymer synthesis and materials from renewable resources.

For information about academic programs and minors, visit:
www.eng.auburn.edu/programs

Graduate curriculum

Auburn's Department of Polymer and Fiber Engineering offers a doctoral degree in addition to a Master of Science, thesis or non-thesis option.

Master of Science (M.S.) — requires 30 credit hours for the thesis option and 36 credit hours for the non-thesis option; core courses focus on polymer and fiber structure, properties and processing, as well as mechanics of fibrous assemblies, coloration, and advances in polymer and fiber composites; assistantships are awarded by individual faculty from their sponsored research grants

Thesis option: PFEN 7990 Research and Thesis for 4 to 6 credit hours counted towards the 30 credit hour minimum

Non-thesis option: requires 6 credit hours of PFEN 7980 Graduate Project; 12 credit hours of PFEN 7980 can be taken; students must pass a final comprehensive written exam; students enrolled in the Ph.D. program and acquiring a M.S. non-thesis may not use a portion of their Ph.D. research to satisfy this requirement

For information, visit:
www.eng.auburn.edu/pfen/mshandbook

Doctor of Philosophy (Ph.D.) — offers a full range of study and research in multidisciplinary areas, including natural and synthetic polymers, nanomaterials, polymer processing, fibrous materials and fibrous composites; requires 30 credit hours of graded graduate course work in 6000-level courses or above and a minimum of 10 credit hours of PFEN 8990 Research and Dissertation; includes a written qualifying exam, followed by a written and oral presentation of the student's Ph.D. proposal administered by the student's advisory committee; requires candidates to write a dissertation and defend work orally

For information, visit:
www.eng.auburn.edu/pfen/phdhandbook

RESEARCH, LABORATORIES AND CENTERS

Polymer and fiber engineering laboratories used by students and faculty are equipped with the latest technology. Undergraduate funded research projects are often available to interested students. Faculty and student research is conducted in the following areas:

- Improved shape memory plastics and tough coating systems for automotive and architectural applications
- Ballistic-resistant materials for personnel protection and structural uses
- Green and sustainable materials using cellulose from harvested trees
- Next generation polymers and films for heat resistance, strength and conductivity
- Antimicrobial materials, such as fibers and coatings
- Nanomaterials for industrial and biomedical applications
- Polymer and ceramic composites
- Injection molding, fiber extrusion and compression molding
- Protective covers for aircraft, vehicles and structures used at work, at home and by the military
- Polymeric and fibrous materials used in drug delivery and biological applications
- Biomass research to develop strong natural materials and composites from seafood industry waste
- Advances in electronic and photonic sensors and devices, fuel cells and batteries
- Hydrogen fuel cell research to develop a fuel cell powered car
- New processing techniques such as electrospinning
- Nonwovens and engineered woven, knit and braided structures

TEAMS AND ORGANIZATIONS

Polymer and fiber engineering students participate in a variety of educational activities outside of the classroom, enjoying time with peers while gaining hands-on experience with project management and teamwork, such as:

- Auburn University's hovercraft team, a part of War Eagle Motorsports
- Tau Beta Pi engineering honor society
- Phi Psi professional fraternity
- Cupola Engineering Ambassadors
- Engineering Student Council

For more information, visit
www.eng.auburn.edu/organizations

LIFE AFTER GRADUATION

There is a strong demand for Auburn PFE graduates in a wide variety of industries. Polymer and fiber engineering uniquely prepares students for careers in research and development, product development, process engineering, composite and polymer engineering, quality assurance engineering, technical services and technical sales for the public and private sectors. Polymer and fiber engineering students have the opportunity to prepare for a variety of graduate degree programs, including biomedical engineering, materials engineering or science, polymer science, biochemistry, environmental science, industrial engineering, medicine and health-related fields, law, computer information systems or business.

SCHOLARSHIPS

The College of Engineering and the Department of Polymer and Fiber Engineering provide scholarship opportunities to students at every stage of their academic career. To be eligible for scholarships at Auburn University, all students must apply through the AUSOM system. Freshmen must submit their applications before March 1.

For information about engineering scholarships, visit
www.eng.auburn.edu/scholarships

CONTACT US

Maria Auad, interim department head

Julia Freeman
Academic Advisor
334.844.5457
freemja@auburn.edu
www.eng.auburn.edu/pfen

Office of Engineering Student Services
1210 Shelby Center
Auburn, AL 36849
334.844.4310
engineering@auburn.edu
www.eng.auburn.edu/ess