

**Master of Science in Polymer
and Fiber Engineering**
(Thesis and Non-Thesis Options)

Auburn University

Graduate Student Handbook

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1. Introduction

This handbook presents guidelines and regulations required to obtain a Master of Polymer and Fiber Engineering degree with Thesis and Non-Thesis options. This document should be used in conjunction with the *Auburn University Graduate Bulletin*. http://www.auburn.edu/student_info/bulletin/.

If in doubt about interpretation of rules and policies contained in this manual or the *Graduate Bulletin*, consult your faculty advisor, Graduate Program Officer (GPO), or Department Head.

2. Program Description

This program is offered in the Department of Polymer and Fiber Engineering in the Samuel Ginn College of Engineering. To obtain the degree each student is required to fulfill the course work and the thesis requirement for the Thesis Option; a graduate project and a final comprehensive written exam for the Non-Thesis Option.

2.1 Course Work

Students must finish a minimum of 30 semester credit hours to obtain the degree of MS with Thesis Option and 36 semester credit hours for MS Non-Thesis Option. A set of core of courses must be passed with a B grade or better. Graduate students must maintain a GPA of 3.0 or better to remain in the Graduate School.

2.1.1 Required Core Courses (18 credit hours):

- PFEN 6200. Advanced Polymer Processing (4). Pr.: departmental approval.
- PFEN 6250. Advanced Engineering Fibrous Structures (3). Pr.: PFEN 4300 or departmental approval.
- PFEN 6510. Polymer Chemistry (3). Pr.: CHEM 2030, ENGR 2050, and PHYS 1610 or departmental approval.
- PFEN 7310. Structure and Properties of Polymers (4). Pr.: CHEM 2080 or departmental approval.
- PFEN 7700. Advanced Methods in Polymer Characterization (4). Pr.: PFEN 6510 or departmental approval.

2.1.2 Other courses offered by the Department (may be taken as recommended by the graduate committee):

- PFEN 6100. Fabrics for Paper Making (3). Pr.: departmental approval.

- PFEN 7210. Fabric Formation and Properties (4). Pr.: PFEN 4300 or departmental approval.
- PFEN 7410. Coloration of Polymers and Fibers (4). Pr.: PFEN 3400 or departmental approval. (previously Physical Chemistry of Dyeing)
- PFEN 7500. Mechanics of Reinforced Materials (3). Pr.: PFEN 4500 or departmental approval.
- PFEN 7610. Polymers from Renewable Resources (2). Pr.: PFEN 5510 or departmental approval.
- PFEN 7620. Advanced Mechanics of Flexible Structures (3). Pr.: PFEN 4400 or departmental approval.
- PFEN 7900 (previously PFEN 7970). Directed Study. Pr.: departmental approval. May be repeated for a maximum of twelve credits.
- PFEN 7910. Polymer Rheology (3). Pr.: departmental approval.
- PFEN 7950. Graduate Seminar (1). Pr.: departmental approval. May be repeated for a maximum of 2 credits.
- PFEN 7960. Special Problems in Polymer and Fiber Engineering (1-3). (previously Directed Readings.)
- PFEN 7970. Special Topics in Polymer and Fiber Engineering (3). Pr.: departmental approval.
- PFEN 7980. Graduate Project (1-3). IND. Pr.: departmental approval. May be repeated for a maximum of twelve credits (for non-thesis option of MS degree).
- PFEN 7990. Research and Thesis (1-10). MST. TD. Pr.: departmental approval.
- PFEN 8200. Advanced Textile Structure Design and Development (3). Pr.: departmental approval.

Statistics:

- STAT 7000. Experimental Statistics I (4) or comparable. Pr.: MATH 1120, STAT 2510 or departmental approval.

2.1.3 Supporting course work

Classes needed beyond the core courses to complete the number of required hours to support the thesis research and to meet the student's career goals, should be arranged with the student's advisor and approved by the student's advisory committee. Supporting course work can be chosen from courses offered by other Departments.

2.1.4 Research and Thesis

2.1.4.1 MS Degree, Thesis Option

Students are required to enroll in PFEN 7990 Research and Thesis for 4 credit hours minimum; a maximum of 6 credit hours can be counted towards the 30 credit hour minimum.

2.1.4.2 MS Degree, Non-Thesis Option

Students in the Non-Thesis Option MUST take at least 6 credit hours of PFEN 7980 (Graduate Project) and pass a final comprehensive written exam. PFEN 7980 must entail in-depth work in a particular project in polymers and fibers. A total of 12 credit hours maximum of PFEN 7980 can be taken. Students in the Ph.D. program may not use a portion of their Ph.D. research to satisfy this requirement.

2.2 Thesis

A thesis is the written record of an original research project undertaken by a graduate student under the supervision of a graduate faculty committee. The thesis is composed of an indication of why the topic is pertinent, what is already known relevant to the subject (literature survey of the topic), what the research objectives are and how they will be investigated, what was found in conducting the research, and how the study contributes to the knowledge base of future research.

The first stage of the thesis is to choose a research topic, a major advisor, and an advisory committee. The next step, after the student gets familiar with the research area by conducting a thorough literature review, is to present a research proposal to the committee outlining basic research idea, research plan, and research approach methodology. The proposal is typically developed under the supervision of the student's major professor, with input from the committee. After the major advisor and committee approve the research plan and methodology, the student is cleared to conduct the research activities under the major advisor's guidance.

When working on his/her thesis, the student has to register for a minimum of two hours of PFEN 7990 each semester. This is the only way that the advisor's work time with the student is documented. While the student is writing the thesis, after finishing the research and course work, he/she may be allowed to register for a minimum of one hour of PFEN 7990 to be reported as a full-time student.

After completion of the research work, a completed draft of the thesis is first presented to the advisor for review, then to the committee 2-3 weeks prior to scheduling a final oral thesis defense. In the oral defense, the student will be asked about his/her research efforts and any other relevant questions including questions about courses listed in the Plan of Study. Final passage in this oral exam requires unanimous approval of all committee members. The committee vote is reported on Form 9, (<http://www.grad.auburn.edu/forms/form9.pdf>), which should be obtained by the student from www.grad.auburn.edu and filled out with the student's name and thesis title prior to the exam. In case of failure to pass the oral exam, the student will be allowed one re-examination contingent on the committee approval and the approval of the Dean of the Graduate School.

3. Procedures

The following outlines some of the procedures required of every graduate student enrolled in the Master of Science in Polymer and Fiber Engineering program:

3.1. Registration procedures and deadlines

To register for the first time, new international students must first visit the Office of International Education, 201 Hargis Hall, with their passports and visa letters to receive a Banner number. They will then take their paperwork to the PFEN Departmental Office, 115 Textile Building. All national students may go directly to the PFEN Departmental Office with their acceptance letter. All new students can register for classes after clearing their medical record with the Student Health Center.

3.2. Plan of study

The Plan of Study is submitted on a form to be obtained electronically from the Graduate School www.grad.auburn.edu. This form lists the course work to be taken by the student and the names of the committee members. The committee must consist of at least three graduate faculty members. The form must be approved by the student's advisor, all committee members, and the Department Head of Polymer and Fiber Engineering. The Plan of Study should be filed by the end of the third semester. If unforeseen circumstances arise, the Plan of Study can be revised.

3.3. Clearance for graduation

In order to get a clearance for graduation each student must have taken the following steps (check for deadlines:

<http://www.grad.auburn.edu/cs/gscalendar.html>):

- “Plan of Study” approved by the Graduate School at least one semester before expected graduation
http://graduate.auburn.edu/gspoststudent/paperforms/mst_semester_for_m.pdf.
- finished the course work and fulfilled all entries in the “Plan of Study”
- finished the research and thesis work, and have the thesis approved by the student advisor and committee
- registered in the semester of graduation
- requested a graduation check from Graduate School, in the semester before the semester of graduation
http://graduate.auburn.edu/GAAP/Interactive_Graduation_Check.pdf)
- notified the Graduate School of the *intention* to graduate, before the beginning of the semester of graduation
- submitted the thesis draft to the Graduate School for “draft check” within the first 2 weeks of the graduation semester (optional) – Thesis option.
 - a) submitted the final thesis along with a signed Form 9 (<http://www.grad.auburn.edu/forms/form9.pdf>), indicating successful completion of oral final examination) to the Graduate School by the deadline outlined in the university calendar (to be found in the Auburn University Bulletin) – Thesis option. Note: starting Fall 2009, theses will be submitted in electronic form. Guidelines can be found on: http://www.grad.auburn.edu/cs/thesis_guide.html
- or –
- b) submitted signed Form 9 indicating successful completion of written final examination to the Graduate School by the deadline outlined in the University Calendar (to be found in Auburn University Bulletin)

4. General Information

The following outlines some of the important information relevant to the program:

4.1. Part and full-time students

A student is considered a full-time student if he/she is registered for 9 or more credit hours per semester. The maximum course load is 16 hours per semester, not including 7990 hours (Research and Thesis). Part-time students do have a lighter course load. After all course work and research efforts are completed, if

the student still has to maintain a full-time load (e.g. international students), he/she can register for a minimum of one hour of PFEN 7990 Research and Thesis plus GRAD7900.

All international students must maintain a full-time course load through the duration of the program. If the student cannot maintain such status for any reason (e.g., no courses are offered, etc.), the student may obtain a waiver from the International Student Office, and have it signed by the student's advisor and Department Head.

4.2. Academic residency

Each student must be a full-time student (taking a course load of at least than 9 credit hours) on campus for a minimum of one semester.

4.3. Graduate assistantship

Graduate assistantships are offered subject to availability of funds and performance in both course work and research. In case the student is awarded an assistantship, he/she must complete the assistantship paperwork in order to get credit for the out-of-state tuition. Once paperwork showing a one-fourth - time or more assistantship position has passed through all necessary university channels, the Bursar's Office can issue credit for the out-of-state tuition. Since this takes some time, the initial tuition bill probably will not show the credit in place.

4.4. Time limit for degree completion

Each student is allowed a maximum of 5 calendar years to finish the Master of Science degree.

4.5. Continuation towards a Ph.D. degree

Students admitted to the M.S. program must reapply if they wish to go on for a Ph.D. degree.

Appendix A: Graduate Faculty in Polymer and Fiber Engineering

The following are the graduate faculty in the department of Polymer and Fiber Engineering and their area of research expertise. Any one of these faculty members could be a major advisor of a student. Committee members are chosen to include three faculty members, with at least two from the Polymer and Fiber Engineering Department.

Sabit Adanur, Ph.D.

Polymer composites and processing, engineered fibrous structures, nanofibers, computer aided design and modeling, testing and analysis, fabric formation and machinery. adanusa@auburn.edu. 222 Textile Building; phone: 334-844-5497.

Maria Lujan Auad, Ph.D.

Polymer materials science, polymer nanocomposites, flow behavior of polymers, control of microstructure and nanostructure in materials, polymers for structural and biomedical applications, shape memory polymers. auad@auburn.edu 103 Textile Building; phone: 334-844-5459.

Royall Broughton, Ph.D.

Chemistry of fibers, fiber extrusion, microscopy, CAD of fabrics, statistical analysis of fiber properties, nonwovens engineering. brougrm@auburn.edu 105 Textile Building; phone: 334-844-5460.

Gisela Buschle-Diller, Ph.D., Graduate Program Officer

Enzyme technology, natural polymers, coloration, nanofibers, surface modification, sustainability issues. buschgi@auburn.edu. 221 Textile Building; phone: 334-844-5468.

Edward W. Davis, Ph.D.

Polymer nanocomposites, bio-degradable polymers, polymer processing, sol-gel derived nanoparticles, clay based nanocomposites. EWD0001@auburn.edu 232 Textile Building; phone: (334) 844-5471

Yehia El Mogahzy, Ph.D.

Fiber and polymer science, quality engineering, statistical analysis of fiber properties, geotextiles. elmogye@auburn.edu 207 Textile Building, phone: 334-844-5463.

Yasser Gawayed, Ph.D.

Design and mathematical modeling of ceramic and polymer textile composites; image analysis. gowayya@auburn.edu. 222A Textile Building, phone: 334-844-5496.

Peter Schwartz, Ph.D.

Mechanics of fibrous structures, composite materials, flow through porous media. schwap1@auburn.edu. 101 Textile Building; phone: 334-844-5452.

Gwynedd Thomas, Ph.D.

Engineered fabrics and design; protective materials (including ballistic resistance, blast protection, chemical resistance, flame resistance, biological agent protection); aircraft and vehicle protective structures; fiber-based medical fabrics and protective materials; communications-enhancing, structural reinforcement fibrous structures.
GAT0001@auburn.edu 117 Textile Building; phone: 334-844-5461.

Xinyu Zhang, Ph.D.

Conducting polymers, carbon nanotubes, sensors, nanocarbons, energy storage and harvesting, xzz0004@auburn.edu. 223 Textile Building; phone: 334-844-5439.