NCSU COLLEGE OF TEXTILES

Department of Textile Engineering, Chemistry and Science

GRADUATE STUDENT HANDBOOK

2006-07 Academic Year

I. PRIOR TO STARTING YOUR DEGREE PROGRAM

A. Residency

If you are not a North Carolina resident and you are a US citizen, you need to take steps to establish North Carolina residency as soon as you arrive. This will facilitate your eligibility for in-state tuition and fee rates after your first year. For more details, please visit the following URL: http://www2.acs.ncsu.edu/grad/students/current/resident.htm.

B. Unity Accounts

E-mail accounts -- called Unity Accounts -- for new students are automatically generated after admission has been granted. The Unity account allows students to access the campus computing resources, register with TRACS online, and access and maintain student information. Students' user IDs are based on first and middle initials and up to the first six letters of the last name. The initial password for student user IDs is set to the students social security number.

C. Registering for Classes

After obtaining a personal ID number (PIN) from their graduate administrator, graduate students may register for classes. At NC State, this is done via TRACS, a touch-tone telephone system, or online.

D. All-Campus Card

Students are required to have an All-Campus Card. The card serves as a student identification card and gives access to multiple services, including D.H. Hill Library, Student Health Services, Carmichael Gymnasium, and special events. When money is deposited on the All-Campus Card, it serves as both a debit card and as a library copy card. The All-Campus Card office is located in the West Dunn Building. You must be registered for classes before an All-Campus Card will be issued.

E. Parking Permit

All vehicles parking on the NC State campus must be registered with Transportation. Valid permits are required for vehicles parked on campus between 7:00 a.m. and 5:00 p.m., Monday through Friday. Permits are sold based on space availability and eligibility, however, graduate students are given preference on the waiting list. A parking permit may be requested when you register for courses via TRACS, or with the Transportation Department located in The Administrative Services Center.

F. Tuition and Fees

You will receive a bill for your tuition and fees that is based on your initial course load. Tuition and fees are payable by the due date on your bill. The Cashier's Office provides you with several options to make your tuition payments -- check, on-line, or by credit card. Students receiving an assistantship should write “Supported by GSSP” on their bill and pay the amount for fees only.

II. PROGRAM STRUCTURE

A. Master of Science in Textile Chemistry, Option A (Thesis) Degree

1. A minimum of 30 credit hours is required to fulfill the degree requirements

2. Students **must** take a minimum of 5 courses from the approved TE offerings[1,2]:

TC 530	The Chemistry of Textile Auxiliaries
TC 561	Organic Chemistry of Polymers
TC 565	Polymer Applications and Technology
TC 589	Special Studies in Textile Engineering Science
TC 704	Fiber Formation – Theory and Practice
TC 705	Theory of Dyeing
TC 706	Color Science
TC 707	Color Laboratory
TC 720	Chemistry of Dyes and Color
TC 721	Dye Synthesis Laboratory
TC 762	Physical Chemistry of High Polymer – Bulk Properties
TC 769	Polymer, Surfactants and Colloidal Materials
TC 771	Polymer Microstructures, Conformations and Properties
TC 772	Physical Chemistry of High Polymers – Solution Properties
TC 779	Diffusion in Polymers
TC 791	Special Topics in Textile Science
TC 792	Special Topics in Fiber Science
TMS 500	Fiber and Polymer Microscopy
TMS 763	Characterization of Structure of Fiber Forming Polymers

[1] All are 3-credit hour courses
[2] Substitutions must be approved by the Director of Graduate Programs, TECS Department.

3. Six hours of TC 695 (Thesis Research), which count toward the 30 credit hour minimum requirement.

4. Two semesters of TC 601 (Graduate Seminar), which count toward the 30 credit hours minimum requirement.

5. Up to three courses (9 credit hours) are to be chosen from supporting (minor) areas. The courses may be selected from a single field, e.g., chemistry, textile technology, or biomedical engineering; from two designated fields (co-minor); or from more than one discipline (interdisciplinary minor). No more than one of these courses may be a 400-level course.

B. Master of Science in Textile Engineering, Option A (Thesis) Degree

1. A minimum of 30 credit hours is required to fulfill the degree requirements.

2. Students **must** take a minimum of 5 courses from the approved TE offerings[1,2]:

TE 501	Analysis and Design of Yarn Production Systems
TE 502	Dynamics of Fabric Production Systems
TE 505	Textile Systems and Control
TE 565	Textile Composites
TE 566	Polymeric Biomaterials Engineering
TE 589	Special Studies in Textile Engineering and Science
TE 717	Multivariable Linear Systems Theory
TMS 500	Fiber and Polymer Microscopy
TMS 761	Mechanical and Rheological Properties of Fibrous Material
TMS 762	Physical Properties of Fiber Forming Polymers, Fibers and Fibrous Structures
TMS 763	Characterization of Structure of Fiber Forming Polymers
TC 704	Fiber Formation – Theory and Practice
TC 762	Physical Chemistry of High Polymers – Bulk Properties

[1] All are 3-credit hour courses
[2] Substitutions must be approved by the Director of Graduate Programs, TECS Department.

3. Six hours of TE 695 (Thesis Research), which count toward the 30 credit hour minimum requirement.

4. Two semesters of TE 601 (Graduate Seminar), which count toward the 30 credit hours minimum requirement.

5. Up to three courses (9 credit hours) are to be chosen from supporting (minor) areas. The courses may be selected from a single field, e.g., textile technology, statistics, or industrial engineering; from two designated fields (co-minor); or from more than one discipline (interdisciplinary minor). No more than one of these courses may be a 400-level course.

C. M.S. Option B (Non-Thesis) Degrees Overview

The Textile Engineering, Chemistry and Science Department oversees two M.S. Option B programs, granting an M.S. degree to students who fulfill the 33-hour course work requirements in textile chemistry or the 30-hour course work requirements in textile engineering, and who pass the department's final oral examination. Students enrolled in this program option will develop a Plan of Graduate Work under the direction of his/her faculty advisor.

Generally, research and thesis preparation courses (TC/TE 695), which may be used in the M.S. Option a (thesis-based) track, may not be used to fulfill the course work requirements for the M.S. Option B degree. An exception is made for M.S. students on the way to a Ph.D. degree. These individuals may count 6 hours of thesis research toward their degree.

A student who passes the Final Oral Examination will be eligible for an M.S. Option B degree in the semester in which the examination is administered or in the semester in which the M.S. course work is completed, whichever comes last.

To obtain an M.S. degree under Option B, a student must complete 2 semesters (6 credit hours) of TC 630 to the satisfaction of the student's program advisor. The results of this course work will serve as the basis for the final oral examination and must be presented no later than two weeks prior to the deadline for submission of degrees for the semester in which the degree is to be awarded. Under normal circumstances, fulfillment of the final examination requirement is expected to be in the province of the student's advisor in co-operation with the Director of Graduate Programs. However, the student's advisor may elect to form an examination/advisory committee that would include a minor representative and/or a third TECS faculty member.

On-campus students may enroll in this program only if they are Ph.D. students who are required to earn a master's degree on the way to the doctoral degree.

Students in the Option B programs are not eligible for assistantships.

D. M.S. in Textile Chemistry, Option B (Non-Thesis) Degree

1. A minimum of 33 credit hours is required to fulfill the degree requirements

2. Students **must** take a minimum of 6 courses from the approved TC offerings[1,2]:

TC 530	The Chemistry of Textile Auxiliaries
TC 561	Organic Chemistry of Polymers
TC 565	Polymer Applications and Technology
TC 589	Special Studies in Textile Engineering Science
TC 704	Fiber Formation – Theory and Practice
TC 705	Theory of Dyeing
TC 706	Color Science
TC 707	Color Laboratory
TC 720	Chemistry of Dyes and Color
TC 721	Dye Synthesis Laboratory
TC 762	Physical Chemistry of High Polymer – Bulk Properties
TC 769	Polymer, Surfactants and Colloidal Materials
TC 771	Polymer Microstructures, Conformations and Properties
TC 772	Physical Chemistry of High Polymers – Solution Properties
TC 779	Diffusion in Polymers
TC 791	Special Topics in Textile Science
TC 792	Special Topics in Fiber Science
TMS 500	Fiber and Polymer Microscopy
TMS 763	Characterization of Structure of Fiber Forming Polymers

[1] All are 3-credit hour courses
[2] Substitutions must be approved by the Director of Graduate Programs, TECS Department.

3. Off-campus (distance education) students **must** complete 6 hours of TC 630 (Independent Study). Students pursuing the M.S. on the way to the Ph.D. may substitute 695 or 895 credits.

4. Two semesters of TC 601 (Graduate Seminar), which count toward the 30 credit hours minimum requirement, are only expected of on-campus students.

5. Up to three courses (9 credit hours) are to be chosen from supporting (minor) areas. The courses may be selected from a single field, e.g., chemistry, textile technology, or biomedical engineering; from two designated fields (co-minor); or from more than one discipline (interdisciplinary minor). No more than one of these courses may be a 400-level course.

E. M.S. in Textile Engineering, Option B (Non-Thesis) Degree

1. A minimum of 30 credit hours is required to fulfill the degree requirements.

2. Students **must** take a minimum of 5 courses from the approved TE offerings[1, 2,3]:

TMS 500	Fiber and Polymer Microscopy
TE 501	Analysis and Design of Yarn Production Systems
TE 502	Dynamics of Fabric Production Systems
TE 505	Textile Systems and Control
TE 565	Textile Composites
TE 566	Polymeric Biomaterials Engineering
TE 589	Special Studies in Textile Engineering
TE 717	Multivariable Linear Systems Theory
TMS 761	Mechanical and Rheological Properties of Fibrous Material
TMS 762	Physical Properties of Fiber Forming Polymers, Fibers and Fibrous Structures
TMS 763	Characterization of Structure of Fiber Forming Polymers
TC 704	Fiber Formation – Theory and Practice
TC 762	Physical Chemistry of High Polymers – Bulk Properties

[1] All are 3-credit hour courses
[2] Substitutions must be approved by the Director of Graduate Programs, TECS Department.
[3] Credit hours taken in TE 695 and TE 699 will not count toward this program

3. Six hours of TE 630 (Independent Study) or approved equivalent independent project courses count toward the 30 credit hour minimum requirement.

4. Two semesters of TC 601 (Graduate Seminar), which count toward the 30 credit hours minimum requirement, are only expected of on-campus students.

5. Up to three courses (9 credit hours) are to be chosen from supporting (minor) area. The courses may be selected from a single field, e.g., textile technology, statistics, or industrial engineering; from two designated fields (co-minor); or from more than one discipline (interdisciplinary minor). No more than one of these courses may be a 400-level course.

III. PROGRAM SPECIFICS

A. Patent Agreement

All graduate students are required to sign a patent agreement at the beginning of their programs. In short, this agreement has to do with the University's rights to any inventions conceived while attending the University. The Plan of Work will not be approved without a signed patent agreement

B. Assistantship Semester Credit Hour Requirement

Graduate students on half-time assistantship must register for a minimum of **nine** credit hours. Those who wish to take more than **ten** credit hours must have approval from the TECS Director of Graduate Programs.

C. Teaching Experience Requirement

All graduate assistants are on 12-month appointments. It is a degree requirement that M.S. students being supported by state-appropriated funds spend 10 hours per week for two semesters in a teaching capacity. The TECS Director of Graduate Programs will make these assignments on an individual basis. The type and amount of teaching will vary from student to student and will be decided on an individual basis, depending on the student's background and the needs of the department.

D. Plan Of Work

The Plan of Work (POW) identifies the graduate faculty that will be mentoring the student's academic progress and the coursework to be taken for the degree. The POW must be signed by the faculty advisory committee and approved by the TECS Director of Graduate Programs. Each semester the student must make progress toward the M.S. degree based on the Plan of Work (POW) originally submitted. If the need arises, the Plan of Work may be revised with the approval of the advisory committee. The POW must be submitted before the student begins their second semester. Whether studying full-time or part-time, students must complete the Master's program within 6 years. Requests for a Leave of Absence must be made in writing and submitted to the host department, should the student need to take no more than a year off from his/her studies.

E. Oral Examination

A request to schedule the final oral exam must be submitted to the graduate school at least 21 days prior to the date on which the student plans to take the exam. However, it is recommended that the student submit the Permit to Schedule the Final Examination form at the beginning of their last semester. For other key policies the student is referred to: http://www.fis.ncsu.edu/grad_publicns/handbook/schedule.htm

F. Continuing On To Ph.D. Program

Students interested in continuing their studies by enrolling in either the Fiber and Polymer Science or the Textile Technology and Management program should contact their advisor(s) concerning how to apply to these programs before completing the Master's degree.

A. Polymer and Color Chemistry

Dr. Keith Beck 919-515-6558, Rm. 3252 keith_beck@ncsu.edu	TECS Department Head. Synthetic and analytical (especially NIR, UV-VIS and HPLC) aspects of textile chemistry. Real-time data acquisition in dyeing processes by FIA and SIA.
Dr. Harold Freeman 919-515-6552, Rm. 3425 harold_freeman@ncsu.edu	Design, synthesis, and analysis of organic dyes and pigments, with emphasis on new chemistries, environmental properties, photodegradation, molecular modeling and analytical methods.
Dr. Peter Hauser 919-513-1899, Rm. 3248 peter_hauser@ncsu.edu	Wet processing (preparation, coloration (dyeing and printing), and finishing) of textiles. Indigo dyeing and garment wet processing. Chemical processes for enhanced value textiles.
Dr. David Hinks 919-515-6554, Rm. 3145 david_hinks@ncsu.edu	Color science; molecular modeling; chemistry and application of dyes; SCF technology.
Dr. Samuel Hudson 919-515-6545, Rm. 3116 sam_hudson@ncsu.edu	Fiber-forming biopolymers. Silk-like proteins, Chitin/chitosan chemistry; formation of structural materials by fiber spinning, gel formation and casting.
Dr. Richard Kotek 919-515-6585, Rm. 3317 richard_kotek@ncsu.edu	Synthesis of fiber-forming polymers. Supramolecular polymers. Melt fiber spinning, including specialty fibers such as antimicrobial and elastic fibers.
Dr. Renzo Shamey 919-515-6546, Rm. 3117 renzo_shamey@ncsu.edu	Color science, digital color measurement, dye application, dyebath monitoring and control, mathematical modeling of textile wet processes, expert systems.
Dr. C. Brent Smith 919-515-6548, Rm. 3119 brent_smith@ncsu.edu	Dyeing and color. Pollution prevention. Novel processing systems. Physical chemistry.
Dr. Alan Tonelli 919-515-6588, Rm. 3146 alan_tonelli@ncsu.edu	Conformations, sizes, and shapes of polymers. (Polymer microstructure and properties, molecular modeling, solid state NMR, behavior of isolated polymer chains, interchain interactions, nanostructuring of polymers)

B. Textile Engineering

Dr. Roger Barker 919-515-6577, Rm. 3315 roger_barker@ncsu.edu	Physical properties of fabrics and clothing systems. (Heat resistant fabrics, fabric comfort and hand, moisture transport mechanisms; protective clothing).
Dr. Timothy Clapp 919-515-6566, Rm. 3251 timothy_clapp@ncsu.edu	Sensor and machine design, Process optimization using modern design tools (e.g. QFD, TRIZ,) and electromechanical principles. Automated transport and manipulation of textiles.
Dr. Russell Gorga 919-515-6553, Rm. 3304 russell_gorga@ncsu.edu	Mechanical and electrical properties of nanocomposite fibers and films. Structure-property relationships of polymer systems. Surface and interfacial properties of polymers with an emphasis on biomedical applications.
Dr. Bhupender Gupta 919-515-6559, Rm. 3147 bgupta@ncsu.edu	Frictional behavior of fibers and textiles; absorption phenomena and absorbent structures; biomedical textiles (sutures, knot security, arterial grafts); characterrization of porosity and pore size distribution; surface energetics.
Dr. Hechmi Hamouda 919-515-6567, Rm. 3310 hechmi_hamouda@ncsu.edu	Application of thermal and fluid sciences to textiles. Mechanics and formation of fibrous structures. Medical and biotextiles. Textile waste-treatment and processing.
Dr. Warren Jasper 919-515-6565, Rm. 3308 warren_jasper@ncsu.edu	Use of computers to monitor, model and control textile processes. (Modeling and controlling batch dyeing, neural-networks, fuzzy logic control, image processing techniques to control/detect fabric defects). Color science.
Dr. Jeff Joines 919-513-4188, Rm. 3317 JeffJoines@ncsu.edu	Optimization and modeling of complex systems utilizing computer simulation, traditional search methods, genetic algorithms, neural networks, and fuzzy logic.
Dr. Wendy Krause 919-515-6560, Rm. 3144 wendy_krause@ncsu.edu	Structure-property relationships of macromolecules, with emphasis on biomaterials, medical textiles, rheology, lubrication, and polyelectrolytes.
Dr. Marian McCord 919-515-6571, Rm. 3320 marian_mccord@ncsu.edu	Plasma treatment and finishing, tissue engineering, biomaterials; barrier fabrics; fiber structure/properties; nanocomposite fibers.
Dr. Melissa Pasquinelli 919-515-9426, Rm. 3324 melissa_pasquinelli@ncsu.edu	Computational modeling as a tool for understanding, predicting, and modulating the physical and chemical properties of macromolecules. Structure-property relationships of nanotechnological and biologically-inspired materials. Quantitative structure-activity relationships of skin sensitivity.
Dr. Jon Rust 919-515-6564, Rm. 3307 jon_rust@ncsu.edu	Process reengineering, especially with regard to fiber-to-yarn conversion and fiber preparation, novel processes and systems, machine and process design.
Dr. Xiangu Zhang 919-515-6547, Rm. 3118 xiangwu_zhang@ncsu.edu	Nanostructured and multifunctional polymer, composite, fiber, and textile materials. Structure-property relationships with an emphasis on energy-related applications.