Mission and Objectives

Numerous competitive challenges are facing the global textile complex. There is a need for industry and government leaders who can provide knowledge of *products, processes* and *business strategies* to effectively position companies to compete in this global marketplace. The Ph.D. in Textile Technology Management program is designed to educate students for research and management careers in textile technology management in the fiber, textile, apparel, retail and related industries complex, as well as for positions in government and academe. **The graduates of this program are expected to play several roles in industry, government, and other institutions, including:**

1. Carrying out research on issues that relate to the technologies of design, characterization, and manufacture of fibers and fibrous products; management of production and sourcing activities; marketing and distribution of products; international trade; information requirements. The plethora of raw materials and product specific technologies extant in the industry coupled with the rapid rate at which these technologies are changing challenge students in the program to be innovative in approaches to product development, processes, and strategic business practices. Graduates assume positions in the industry with prime responsibilities for developing policy alternatives for strategic and long range planning.

2. Contributing to the teaching and research in institutions concerned with fiber, textile, apparel and retail programs.

3. Developing policies at the highest level where broad technical and managerial expertise is required to ensure proper decision-making.

The **educational objectives** of the TTM Ph.D. program are two-fold:

1. To prepare managers for the research and technological enterprises within the fiber, textile, apparel, retail and related industries. To achieve this objective, the programs of study will be designed for each student to acquire and integrate knowledge of the materials and technologies used in the industrial complex by applying those quantitative, qualitative, and analytical techniques of management that would be most useful for their career goals.

2. To prepare graduates to be faculty members in the numerous international colleges and universities.
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I. PROGRAM INTRODUCTION

The Ph.D. degree symbolizes the ability of the recipient to undertake original and scholarly work at the highest levels without supervision. The degree is, therefore, not granted simply upon the completion of a stated amount of course work but rather upon demonstration by the student of a comprehensive knowledge base and high attainment in scholarship. The student demonstrates this ability by passing a series of preliminary written examinations, an oral preliminary examination, writing a dissertation reporting the results of an original investigation, and making a final oral defense of the research before the student’s advisory committee and other interested members of the University community.

A minimum of 72 credit hours is required of students entering the program with a B.S. degree, and a minimum of 54 credit hours beyond the M.S. degree is required. (Students, who enter the PhD program directly upon completion of an MS at NC State, may be allowed credit for up to 30 hours of their MS and thus would require 42 additional credit hours to complete the PhD). The student generally selects courses, in consultation with his/her advisory committee, so as to prepare for admission to candidacy for the degree and to carry out his/her proposed research. (Students are admitted to candidacy after meeting the course requirements and passing the preliminary comprehensive written and oral examination.)

The Textile Technology Management Program requires successful completion of a specific set of four qualifying courses; a minimum of two additional graduate courses; plus two semesters of TTM 801 (which may be waived for students who have taken TC, TE, TT or TTM 601). These additional courses (which should be selected with input from the advisory committee) can be part of an “official minor” and will require approval from the Director of Graduate Programs of the Minor, or can be courses chosen to provide a better foundation for the research work. The coursework must be followed by the successful defense of a research proposal, after which the student is a candidate for the Ph.D. degree. The student must subsequently submit and successfully defend a dissertation, based on a body of their original research, before the committee recommend that the doctorate be awarded.

The anticipated time for completion of the Ph.D. program is four years for B.S. entry and three years for M.S. entry. The minimum time required (in exceptional cases) is two years beyond entry if the student obtained an M.S. degree from NC State.

Students are expected to comply with the University guidelines on course load unless special justification can be made for an exception. Any such exceptions must be sanctioned by the Graduate Program Director and approved by the Dean of the Graduate School in advance. Such exceptions will normally not be allowed to extend beyond one semester.
II. PROGRAM STRUCTURE

A. Overview

The program has several “milestones” which must be met by the student and these consist of:

- Successful completion of a specified set of qualifying courses.
- Satisfactory completion of a Preliminary Written Examination consisting of a critical review of literature in the area of the student’s proposed research
- Preliminary Oral Examination
- Preparation of a dissertation of original research,
- Final Oral Defense of the dissertation

Guidance in the planning of these activities will be given by the student’s chair(s) and committee and will form the basis of the student’s Graduate Plan of Work.

B. Ph.D. Program Requirements

B.1 “Qualifying Course” Requirement

Every student must obtain a grade of B or better in each of the four courses outlined in Appendix 1. The 700 level courses cover four focus areas, which are:

- Textile Technology
- Management
- Textile Technology Management
- Research Methodology

In addition, students will be required to complete a minimum of two further graduate courses which will be approved by the Advisory Committee in the student’s Graduate Plan of Work.

Students entering the program with a Masters degree will be expected to complete the “qualifying course” requirement by the end of the third semester.

B.2 Preliminary Written Examination

The Preliminary Written Examination is designed to:

- Evaluate the student’s breadth of knowledge in the underlying disciplinary and applied areas of textile technology and management
- Confirm that the student can demonstrate an in depth understanding of his/her chosen area of specialization.
Students who have successfully passed all 4 qualifying courses, will proceed to produce a scholarly, in-depth, critical review of existing knowledge, in the field of specialization in which the student hopes to base his/her dissertation proposal. The review must be submitted to the student’s committee for grading. If the committee agrees that the review is of an acceptable standard, (ideally it should be of “publishable quality”) the student may then schedule an oral defense of the review, coupled with a presentation of a research proposal.

B.3 Preliminary Oral Examination for Admission to Candidacy

After the student’s Advisory Committee has agreed that the written critical review is acceptable, the student is expected to prepare, present, and defend a research proposal. The presentation will be made to an examining committee consisting of the student’s Advisory Committee. The presentation may also be open to interested faculty and students (with permission of the candidate). Usually the proposal will utilize the literature review as the background on which the research is to be based. The proposal should also include an indication of research methodologies to be used, resources needed, and a projected timeline. After the presentation the student will be orally examined by the examining committee, to test his/her ability to relate factual knowledge to specific circumstances, to use knowledge with accuracy and promptness, and to demonstrate a comprehensive understanding of the field of specialization and related areas. Upon satisfactory completion of the oral examination, the student is admitted to candidacy for the degree.

For a student entering the program with a M.S. degree, the preliminary examination must be completed before the end of their 4th semester. In the event of a “Conditional Pass”, the terms specified in the conditions must be satisfied before the end of the 5th semester.

B4. Preparation of Dissertation

Under the advisement of his/her Chair(s) and Advisory Committee, the student will write a dissertation covering the original research they have carried out. The Advisory Committee decides on the format of the dissertation which can be:

- **Either** "traditional" (consisting of various chapters, such as – Literature Review, Experimental Design and Methodologies, Preliminary Trials,.....Conclusions, etc.).
- **Or** a collection of papers which have either been published, accepted for publication, submitted, or are ready for submission to a refereed journal.

The dissertation will follow the guidelines set by Graduate School [https://grad.ncsu.edu/wp-content/uploads/2015/11/etd-guide.pdf](https://grad.ncsu.edu/wp-content/uploads/2015/11/etd-guide.pdf) and the completed dissertation must be distributed to the members of the examining committee at least two weeks before the final oral examination is scheduled.

B5. Final Oral Defense

The final oral examination cannot be scheduled less than one semester after admission to candidacy.
The oral examination can be scheduled two weeks after the examining committee has received copies of the completed dissertation. The oral presentation is open to interested parties, who may ask questions of the candidate, but the final examination is normally conducted in closed session of the candidate and the examining committee. Additional details are provided in the graduate catalog.
http://www.ncsu.edu/grad/catalog/index.php

C. Checklist for Ph.D. students

__ Ensure that registration is complete before census day and that course load is within the prescribed limits

__ Select dissertation research advisor [Chair(s)] and notify Office of Academic Programs by the end of the second month on campus.

__ Complete committee selection and complete the online plan of work (POW) and check the Patent Agreement box. The POW must be submitted before the student completes the second semester of the graduate study program. https://grad.ncsu.edu/wp-content/uploads/2015/12/GRAD-SIS-training-manual-students.pdf

__ Grade Point Average (GPA) must be maintained at 3.000 or higher. Language requirement must have been satisfied and recorded with the Graduate School.

__ The written portion of the preliminary examination must be completed, and approved, prior to scheduling the preliminary oral examination.

__ Attend Graduate School Thesis Preparation Workshop during third semester and obtain a copy of the University’s Guide for the Preparation of Theses from the Graduate School Office.

__ Schedule the preliminary oral examination **at least 3 weeks** before the proposed date.

__ The doctoral residence requirements must be met prior to scheduling the final oral examination. [http://www.ncsu.edu/grad/handbook/sections/3.15-registration-and-residence.html](http://www.ncsu.edu/grad/handbook/sections/3.15-registration-and-residence.html)

__ At least four calendar months must elapse between the preliminary and final oral examinations.

__ Schedule the final oral examination **at least 3 weeks** before the proposed date. [http://www.ncsu.edu/grad/etd/deadlines.html](http://www.ncsu.edu/grad/etd/deadlines.html)

__ Online: Apply to Graduate in the semester you are planning to finish. [http://www.ncsu.edu/grad/faculty-and-staff/docs/GRAD-SIS-training-manual-students.pdf](http://www.ncsu.edu/grad/faculty-and-staff/docs/GRAD-SIS-training-manual-students.pdf)

__ Distribute completed dissertation to advisory committee and Graduate School representative **at least two weeks** before the scheduled examination.
__ Follow online instructions on submission of the thesis draft to the Graduate School Thesis Editor and obtain preliminary approval of your thesis. http://www.ncsu.edu/grad/etd/

__ One month before departure, send letter of resignation to College Business Office.

__ Clean laboratory and office, take care of any fees owed to the University, and turn in your keys. (The diploma will be held until all keys have been returned.)

__ Clear all responsibilities (lab waste, office and lab keys, desk key, and library) and have separation form signed by appropriate COT personnel.

Changes in degree objectives, committee composition, and Plan of Work should be requested as the need arises. Handling these matters at the time of scheduling examinations will create delays.

D. Submission of Theses and Dissertations

Please refer to http://www.ncsu.edu/grad/etd/ for instructions and details on preparing and submitting your theses and dissertations.

Deadline to graduate, but not register for the current semester: The student must have passed oral examination "unconditionally", or passed "conditionally" and have cleared all conditions; and met with the thesis editor by the LAST WORKING DAY BEFORE THE FIRST DAY OF CLASS FOR THAT SEMESTER. It is not necessary to turn in the final thesis by that date, just to have had the review.

Thesis deadline: The student must have passed the oral examination "unconditionally" or have passed “conditionally” and have cleared all conditions; and have met with the thesis editor by FOUR WEEKS BEFORE THE LAST DAY OF CLASS.

III. TTM GRADUATE FACULTY MEMBERS

Please refer to faculty list at http://www.grad.ncsu.edu/catalog/prg.asp?id=TTM.
APPENDIX 1

Qualifying courses for TTM Program

FOUR COURSES MUST BE COMPLETED, WITH A GRADE OF B OR BETTER, BY THE END OF THE 3rd SEMESTER

All students must take:

**Fall**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTM 791-001</td>
<td>Research Methodology</td>
</tr>
<tr>
<td>TTM 791-002</td>
<td>Textile Technology Management</td>
</tr>
</tbody>
</table>

**Spring**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTM 791-003</td>
<td>Textile Technology</td>
</tr>
<tr>
<td>TTM 791-004</td>
<td>Textile Management</td>
</tr>
</tbody>
</table>

Note: The courses will initially be taught as “Advanced Special Studies in Textile Technology Management” but will be ultimately be given permanent numbers.