# Textile Chemistry (MS)

## Master of Science Degree Requirements

Students are required to take a total of 8 courses (24 credits of graded coursework), meeting criteria #1 and #2 below, courses may count toward both criteria (e.g. all TE and some TC courses). Additional courses must be of the graduate level (500-level or above) and be relevant to the field of study.

| Code | Title | Hours |
|---|---|---|
| **TECS Core Courses** | | **15** |
| **Criteria #1** [1] | | |
| See "Criteria #1" listed below | | |
| **Engineering Content Courses** | | **12** |
| **Criteria #2** | | |
| See "Criteria #2" listed below | | |
| **TECS Seminar** | | **2** |
| TC 601 | Seminar | |
| TC 601 | Seminar | |
| **Research / Independent Studies** | | **6-9** |
| Select either "Option A" or "Option B" | | |
| **Option A** [2] | | |
| TC 630 | Independent Study | |
| TC 693 | Master's Supervised Research | |
| TC 695 | Master's Thesis Research | |
| TC 696 | Summer Thesis Research | |
| **Option B** [3] | | |
| TC 630 | Independent Study | |
| TC 630 | Independent Study | |
| **Total Hours** | | **32-36** |

[1] The TC and some TE/FPS courses may also count towards criteria #2 as listed there

[2] At least 6 credits of research or independent study courses, the first 6 credits are always recommended to be TC 630

[3] 6 credits of independent study

## Criteria #1

| Code | Title | Hours |
|---|---|---|
| Select a minimum of five courses from the TECS faculty-taught courses listed below | | 15 |
| **Total Hours** | | **15** |

### TC PREFIX

| Code | Title | Hours |
|---|---|---|
| **500-Level Courses** | | |
| TC 530 | The Chemistry Of Textile Auxiliaries | 3 |
| TC 561 | Organic Chemistry Of Polymers | 3 |
| TC 565 | Polymer Applications and Technology | 3 |
| TC 589 | Special Studies In Textile Engineering and Science | 1-4 |
| **700-Level Courses** | | |
| TC 704 | Fiber Formation--Theory and Practice | 3 |
| TC 705 | Theory Of Dyeing | 3 |
| TC 706 | Color Science | 3 |
| TC 707 | Color Laboratory | 1 |
| TC 710 | Science of Dye Chemistry, Dyeing, Printing and Finishing | 3 |
| TC 720 | Chemistry Of Dyes and Color | 3 |
| TC 771 | Polymer Microstructures, Conformations and Properties | 3 |
| TC 791 | Special Topics In Textile Science | 1-6 |
| TC 792 | Special Topics In Fiber Science | 1-6 |

### TE PREFIX

| Code | Title | Hours |
|---|---|---|
| **500-Level Courses** | | |
| TE 505 | Textile Systems and Control | 3 |
| TE 533 | Lean Six Sigma Quality | 3 |
| TE 540 | Textile Information Systems Design | 4 |
| TE 550 | Clothing Comfort and Personal Protection Science | 3 |
| TE 551 | Human Physiology for Clothing and Wearables | 3 |
| TE 562 | Simulation Modeling | 3 |
| TE 565 | Textile Composites | 3 |
| TE 566 | Polymeric Biomaterials Engineering | 3 |
| TE 570 | Polymer Physics | 3 |
| TE 589 | Special Studies In Textile Engineering and Science | 1-4 |

### TT PREFIX

| Code | Title | Hours |
|---|---|---|
| **500-Level Courses** | | |
| TT 503 | Materials, Polymers, and Fibers used in Nonwovens | 3 |
| TT 504 | Introduction to Nonwovens Products and Processes | 3 |
| TT 505 | Advanced Nonwovens Processing | 3 |
| TT 507 | Nonwoven Characterization Methods | 4 |
| TT 508 | Nonwoven Product Development | 3 |
| TT 520 | Yarn Processing Dynamics | 3 |
| TT 521 | Filament Yarn Production Processing and Properties | 3 |
| TT 530 | Textile Quality and Process Control | 3 |
| TT 532 | Evaluation of Biotextiles | 3 |
| TT 533 | Lean Six Sigma Quality | 3 |
| TT 581 | Technical Textiles | 3 |

### OTHER PREFIXES

| Code | Title | Hours |
|---|---|---|
| **500-Level Courses** | | |
| TTM 501 | Textile Enterprise Integration | 3 |
| **700-Level Courses** | | |
| TMS 761 | Mechanical and Rheological Properties Of Fibrous Material | 3 |
| TMS 762 | Physical Properties Of Fiber Forming Polymers, Fibers and Fibrous Structures | 3 |

| | | |
|---|---|---|
| TMS 763 | Characterization Of Structure Of Fiber Forming Polymers | 3 |
| FPS 710 | Science of Dye Chemistry, Dyeing, Printing and Finishing | 3 |
| FPS 750 | Advances in Fabric Formation, Structure, and Properties | 3 |
| FPS 770 | Advances in Polymer Science | 3 |

## Criteria #2

| Code | Title | Hours |
|---|---|---|
| Select a minimum of four courses from the Chemistry graduate-level classes | | 12 |
| TC 500+ | Any graded (non-research) TC course at the 500 level or higher | |
| Chemistry 500+ | Any graded (non-research) Chemistry course at the 500-level or higher, such as, but not limited to prefixes: CH and CHE | |
| See "Additional Course Options" listed below for approved exceptions in other areas | | |
| **Total Hours** | | **12** |

### Additional Course Options

| Code | Title | Hours |
|---|---|---|
| TT/NW 503 | Materials, Polymers, and Fibers used in Nonwovens | |
| TE/PY 570 | Polymer Physics | |
| TMS 762 | Physical Properties Of Fiber Forming Polymers, Fibers and Fibrous Structures | |
| TMS/MSE 763 | Characterization Of Structure Of Fiber Forming Polymers | |
| FPS 710 | Science of Dye Chemistry, Dyeing, Printing and Finishing | |
| FPS 770 | Advances in Polymer Science | |
| BCH 751 | Biophysical Chemistry | |
| FB 516 | Forest Products Colloids & Surfaces | |
| FB 723 | Forest Biomaterials Chemistry | |
| MSE 565 | Introduction to Nanomaterials | |
| MSE/CHE 761 | Polymer Blends and Alloys | |
| MSE 775 | Structure of Semicrystalline Polymers | |
| CHE/BEC 562 | Fundamentals of Bio-Nanotechnology | |

# Accelerated Bachelor's/Master's Degree Requirements

The Accelerated Bachelors/Master's (ABM) degree program allows exceptional undergraduate students at NC State an opportunity to complete the requirements for both the Bachelor's and Master's degrees at an accelerated pace. These undergraduate students may double count up to 12 credits and obtain a non-thesis Master's degree in the same field within 12 months of completing the Bachelor's degree, or obtain a thesis-based Master's degree in the same field within 18 months of completing the Bachelor's degree.

This degree program also provides an opportunity for the Directors of Graduate Programs (DGPs) at NC State to recruit rising juniors in their major to their graduate programs. However, permission to pursue an ABM degree program does not guarantee admission to the Graduate School. Admission is contingent on meeting eligibility requirements at the time of entering the graduate program.

# Faculty

## Full Professor

Roger Barker

Philip Bradford

Laura Clarke

Emiel DenHartog

Ahmed El-Shafei

Raoul Farer

David Hinks

Warren Jasper

Jeff Joines

Martin King

Jerome Lavelle

Karen Leonas

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Renzo Shamey

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## Associate Professors

Ericka Ford

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## Assistant Professors

Januka Budhathoki-Uprety

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Jessica Gluck

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Tova Williams

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Mengmeng Zhu

## Research Faculty

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## Adjunct Faculty

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Gisela de Aragao Umbuzeiro

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