

Textile Technology (BS): Technical Textiles Concentration

Our B.S. in Textile Technology (<https://textiles.ncsu.edu/academics/undergraduate/textile-technology/>) is perfect for students who want a hands-on, applied science education spent in labs instead of behind a desk.

Textile technology students learn not only about the fibers that make up the textiles we use in everything from outdoor gear to sneakers, but also about business, supply chain operations and manufacturing. They then apply this knowledge to work with textile engineering students and industry partners on a year-long Senior Design project (<https://textiles.ncsu.edu/student-experience/senior-design/>).

The Technical Textiles concentratio (<https://textiles.ncsu.edu/academics/undergraduate/textile-technology/technical-textiles/>) covers design principles, applications, and technologies relevant to the vast array of technical textiles materials and products used in such areas as transportation, storage, packaging, automobile engineering, geotechnical engineering and much more. This concentration offers two options: materials and nonwovens.

Contact

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Plan Requirements

| Code | Title | Hours |
|-----------------------------------|--|-------|
| Orientation | | |
| T 101 | Strategies for Success in the Wilson College of Textiles | 1 |
| MA/ST and Natural Sciences | | |
| MA 141 | Calculus I ¹ | 4 |
| MA 241 | Calculus II | 4 |
| ST 311 | Introduction to Statistics | 3 |
| or ST 370 | Probability and Statistics for Engineers | |
| CH 101 & CH 102 | Chemistry - A Molecular Science and General Chemistry Laboratory ¹ | 4 |
| PY 205 & PY 206 | Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory | 4 |
| PY 208 & PY 209 | Physics for Engineers and Scientists II and Physics for Engineers and Scientists II Laboratory | 4 |
| Major Requirements | | |
| EC 205 | Fundamentals of Economics | 3 |
| FTM 217 | The Textile Industry | 3 |
| MT 366 | Biotextile Product Development | 3 |
| PCC 302 | Technology of Textile Wet Processing | 4 |
| TE 200 | Introduction to Polymer Science and Engineering | 3 |

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|--------|---|---|
| TE 201 | Fiber Science | 4 |
| TT 105 | Introduction to Textile Technology | 3 |
| TT 327 | Yarn Production and Properties | 4 |
| TT 331 | Performance Evaluation of Textile Materials | 4 |
| TT 341 | Knitted Fabric Technology | 3 |
| TT 351 | Woven Products and Processes | 3 |
| TT 380 | Management and Control of Textile and Apparel Systems | 3 |
| TT 401 | Textile Technology Senior Design I | 4 |
| TT 402 | Textile Technology Senior Design II | 4 |
| TT 404 | Introduction to Nonwovens Products and Processes | 3 |
| TT 431 | Quality Management and Control In Textile Manufacturing | 3 |
| TT 481 | Design and Technology of Technical Textiles | 3 |

Technical Textiles Concentration

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| Technical Textiles Electives (p. 1) | 16 |
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GEP Courses

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| Acad Writing Research (p. 1) | 4 |
| GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/) | 6 |
| GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/) | 3 |
| GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/) | 2 |
| GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) | 3 |
| GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/) | 5 |
| GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement) | |
| GEP Foundations of American Democracy (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-fad/) (verify requirement) | |
| World Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/) (verify requirement) | |

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| Total Hours | 120 |
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Acad Writing Research

| Code | Title | Hours |
|------------------------------|--------------------------------------|-------|
| Acad Writing Research | | |
| ENG 101 | Academic Writing and Research | 4 |
| WLEN 101 | Academic Writing and Research | 4 |
| Transfer Sequence | | |
| ENG 1 GEP | | 3 |
| ENG 202 | Disciplinary Perspectives in Writing | 3 |

Technical Textiles Concentration

| Code | Title | Hours |
|---------|------------------------------------|-------|
| BME 466 | Polymeric Biomaterials Engineering | 3 |
| BME 566 | Polymeric Biomaterials Engineering | 3 |

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| CH 220 | Introductory Organic Chemistry | 3 |
| CH 201 | Chemistry - A Quantitative Science | 3 |
| CH 202 | Quantitative Chemistry Laboratory | 1 |
| CH 331 | Introductory Physical Chemistry | 4 |
| DSC 201 | Introduction to R/Python for Data Science | 1 |
| DSC 205 | Data Communication | 1 |
| DSC 295 | Introductory Special Topics in Data Science | 1-3 |
| DSC 406 | Exploratory Data Analysis for Big Data | 1 |
| DSC 412 | Exploring Machine Learning | 1 |
| DSC 495 | Special Topics in Data Science | 1-3 |
| FTM 491 | Special Topics in Textile and Apparel Management | 1-4 |
| GC 120 | Foundations of Graphics | 3 |
| MA 242 | Calculus III | 4 |
| MSE 201 | Structure and Properties of Engineering Materials | 3 |
| MSE 255 | Experimental Methods for Structural Analysis of Materials | 2 |
| MSE 300 | Structure of Materials at the Nanoscale | 3 |
| MSE 380 | Microstructure of Organic Materials | 3 |
| MSE 455 | Polymer Technology and Engineering | 3 |
| MT 381 | Medical Textile and the Regulatory Environment | 3 |
| MT 471 | Chemistry of Biopolymers | 3 |
| NW/TT 405 | Advanced Nonwovens Processing | 3 |
| NW/TT 408 | Nonwoven Product Development | 3 |
| NW/TT 504 | Introduction to Nonwovens Products and Processes | 3 |
| TT 407 | Characterization Methods in Nonwovens | 3 |
| NW 497 | Research Experience in Nonwoven Science and Technology | 3 |
| NW/TT 505 | Advanced Nonwovens Processing | 3 |
| NW/TT 507 | Nonwoven Characterization Methods | 3 |
| NW/TT 508 | Nonwoven Product Development | 3 |
| PCC 106 | Chemistry of Colorants and Auxiliaries | 3 |
| PCC 201 | Impact of Industry on the Environment and Society | 3 |
| PCC 274 | Introduction to Forensic Science | 3 |
| PCC 301 | Technology of Dyeing and Finishing | 3 |
| PCC 304 | Technology of Dyeing & Finishing Laboratory | 1 |
| PCC 350 | Introduction to Color Science and Its Applications | 2 |
| PCC 354 | Intro to Color Science Laboratory | 1 |
| PCC 404 | Introduction to the Theory and Practice of Fiber Formation | 3 |
| PCC 410 | Textile Preparation and Finishing Chemistry | 3 |
| PCC 412 | Textile Chemical Analysis | 2 |
| PCC 414 | Textile Chemistry Analysis Lab | 1 |
| PCC 420 | Textile Dyeing and Printing | 3 |
| PCC 442 | Theory of Physico-Chemical Processes in Textiles II | 3 |
| PCC 461 | Chemistry of Polymeric Materials | 3 |
| PCC 462 | Characterization and Physical Properties of Polymers | 3 |
| PCC 464 | Chemistry of Polymeric Materials Laboratory | 1 |
| PCC 466 | Polymer Chemistry Laboratory | 3 |
| PCC 471 | Chemistry of Biopolymers | 3 |
| PCC 474 | Forensic Chemistry Laboratory | 3 |

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| PCC 490 | Undergraduate Research in Polymer and Color Chemistry | 1-6 |
| PY 570 | Polymer Physics | 3 |
| T 104 | Fabric of Success and Career Readiness | 1 |
| T 497 | Independent Research in Textile Engineering, Chemistry and Materials Science I | 1-3 |
| T 498 | Independent Research in Textile Engineering, Chemistry and Materials Science II | 1-3 |
| TE 463 | Polymer Engineering | 3 |
| TE 110 | Computer-Based Modeling for Engineers | 3 |
| TE 303 | Thermodynamics for Textile Engineers | 3 |
| TE 440 | Textile Information Systems Design | 4 |
| TE 466 | Polymeric Biomaterials Engineering | 3 |
| TE 467 | Mechanics of Tissues & Implants Requirements | 3 |
| TE 533 | Lean Six Sigma Quality | 3 |
| TE 550 | Clothing Comfort and Personal Protection Science | 3 |
| TE 551 | Human Physiology for Clothing and Wearables | 3 |
| TE 566 | Polymeric Biomaterials Engineering | 3 |
| TE 560 | Fiber Manufacturing Technology | 3 |
| TE 570 | Polymer Physics | 3 |
| TT/TTM 533 | Lean Six Sigma Quality | 3 |

Semester Sequence

This is a sample.

First Year

| Fall Semester | | Hours |
|-----------------|---|-----------|
| CH 101 & CH 102 | Chemistry - A Molecular Science and General Chemistry Laboratory ¹ | 4 |
| ENG 101 | Academic Writing and Research | 4 |
| MA 141 | Calculus I ¹ | 4 |
| TT 105 | Introduction to Textile Technology (CP) | 3 |
| T 101 | Strategies for Success in the Wilson College of Textiles | 1 |
| Hours | | 16 |

| Spring Semester | | Hours |
|---|--|-----------|
| MA 241 | Calculus II | 4 |
| PY 205 & PY 206 | Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory | 4 |
| FTM 217 | The Textile Industry | 3 |
| GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/) | | 1 |
| GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/) | | 3 |
| Hours | | 15 |

Second Year

| Fall Semester | | Hours |
|-----------------|--|-------|
| PY 208 & PY 209 | Physics for Engineers and Scientists II and Physics for Engineers and Scientists II Laboratory | 4 |
| TE 201 | Fiber Science | 4 |
| TT 327 | Yarn Production and Properties (CP) | 4 |

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|--------------|---|-----------|
| TT 380 | Management and Control of Textile and Apparel Systems | 3 |
| Hours | | 15 |

Spring Semester

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|------------------------------------|---|-----------|
| ST 311 | Introduction to Statistics | 3 |
| EC 205/201 | Fundamentals of Economics | 3 |
| TE 200 | Introduction to Polymer Science and Engineering | 3 |
| TT 341 | Knitted Fabric Technology (CP) | 3 |
| Technical Textiles Elective (p. 1) | | 3 |
| Hours | | 15 |

Third Year**Fall Semester**

| | | |
|---|--|-----------|
| TT 351 | Woven Products and Processes | 3 |
| TT 404 | Introduction to Nonwovens Products and Processes | 3 |
| PCC 302 | Technology of Textile Wet Processing | 4 |
| Technical Textiles elective (p. 1) | | 3 |
| GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/) | | 3 |
| Hours | | 16 |

Spring Semester

| | | |
|--|---|-----------|
| TT 331 | Performance Evaluation of Textile Materials (CP) | 4 |
| TT 431 | Quality Management and Control In Textile Manufacturing | 3 |
| MT 366 | Biotextile Product Development | 3 |
| GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) | | 3 |
| Technical Textiles electives (p. 1) | | 3 |
| Hours | | 16 |

Fourth Year**Fall Semester**

| | | |
|--|---|-----------|
| TT 401 | Textile Technology Senior Design I | 4 |
| TT 481 | Design and Technology of Technical Textiles | 3 |
| Technical Textile Elective (p. 1) | | 2-3 |
| GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/) | | 2-3 |
| GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/) | | 3 |
| Hours | | 14 |

Spring Semester

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|--|-------------------------------------|-----|
| TT 402 | Textile Technology Senior Design II | 4 |
| Select Two Technical Textile Elective (p. 1) | | 5-6 |
| GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/) | | 2-3 |

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| HESF 1 GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/) | 1 |
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| Hours | 13 |
| Total Hours | 120 |

¹ Must be completed with a grade of C- or higher for major requirements

Career Opportunities

You can find textiles just about anywhere, which means you can find our graduates there too. Textile Technology alumni land jobs within aerospace, medicine, automotive, apparel, sports, manufacturing and more.

These are just a few of the places our graduates go:

- Athletics and Apparel: Nike, Adidas, The North Face, New Balance, Reebok, Levis, Fruit of the Loom, Hanesbrands
- Healthcare/Medical Textiles: Medline, Secant Medical
- Homewares: Target, Kohl's
- Government Agencies/Defense: United States Patent and Trademark Office, State Bureau of Investigation (SBI)
- Traditional Textiles: Milliken, Unifi, Parkdale Mills, Glen Raven, Springs Global
- Plus: SAS, All Trails, Lenovo, Cisco, Accenture, IBM, Wolfspeed Inc.

Career Titles

- Materials Developer / Specialist / Designer
- Research and Development Engineer
- Product Development Specialist
- Strategic Sourcing Manager
- Logistics Manager / Inventory Manager
- Data Scientist
- Design Engineer / Process Improvement Engineer
- Production Manager / Project Engineer / Product Manager
- Quality Control Engineer
- Technical Marketing Manager
- Technical Service / Sales

Learn More About Careers

NCcareers.org (<https://nccareers.org/>)

Explore North Carolina's central online resource for students, parents, educators, job seekers and career counselors looking for high quality job and career information.

Occupational Outlook Handbook (<https://www.bls.gov/ooh/>)

Browse the Occupational Outlook Handbook published by the Bureau of Labor Statistics to view state and area employment and wage statistics. You can also identify and compare similar occupations based on your interests.

Career One Stop Videos (<https://www.careeronestop.org/>)

View videos that provide career details and information on wages, employment trends, skills needed, and more for any occupation. Sponsored by the U.S. Department of Labor.

Focus 2 Career Assessment (<https://careers.dasa.ncsu.edu/explore-careers/career-assessments/>) (NC State student email address required)

This career, major and education planning system is available to current NC State students to learn about how your values, interests, competencies, and personality fit into the NC State majors and your future career. An NC State email address is required to create an account. Make an appointment with your career counselor (<https://careers.dasa.ncsu.edu/about/hours-appointments/>) to discuss the results.

Focus 2 Apply Assessment (<https://www.focus2career.com/Portal/Register.cfm?SID=1929>) (Available to prospective students)

A career assessment tool designed to support prospective students in exploring and choosing the right major and career path based on your unique personality, interests, skills and values. Get started with Focus 2 Apply and see how it can guide your journey at NC State.

American Society of Quality (<http://asq.org/>)

The Fiber Society (<https://www.thefibersociety.org/>)