Polymer and Color Chemistry (BS): Medical Sciences Concentration

This bachelor's degree takes an applied, hands-on approach to chemistry focusing on the building blocks of the materials we come into contact with every day: polymers and dyes.

Students majoring in Polymer and Color Chemistry (https://textiles.ncsu.edu/academics/undergraduate/polymer-and-color-chemistry/) (PCC) learn about dye chemistry, color science, and textile wet processes in our Dyeing and Finishing Lab Pilot Plant and DataColor Lab. This experiential learning wraps up with a capstone project covering a range of projects unavailable anywhere else.

The Medical Sciences concentration (https://textiles.ncsu.edu/academics/undergraduate/polymer-and-color-chemistry/medical-sciences/) is one of three concentrations offered in the PCC degree. Students looking to enter the medical field or some sort of medical school, including dentistry or ophthalmology, will find this concentration helpful in achieving their goals. The flexibility of this concentration helps students complete all prerequisite courses needed to apply to medical school. Students completing this concentration with a good GPA have been successful in gaining entrance into medical schools.

Contact

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Plan Requirements

Code	Title	Hours	Counts towards
Orientation			
T 101	Strategies for Success in the Wilson College of Textiles	1	
Writing & Speaking			
Acad Writing Research (p. 2) [1]		4	
Major Requirements			
PCC 101	Introduction to Polymer and Color Chemistry	2	
PCC 104	Introduction to Polymer and Color Chemistry Lab	1	
PCC 106	Chemistry of Colorants and Auxiliaries (Polymer Synth. Sustain. the Env.)	3	
TE 200	Introduction to Polymer Science and Engineering	3	
TE 201	Fiber Science	4	
TMS 212	Yarn and Fabric Formation and Properties	2	
PCC 301	Technology of Dyeing and Finishing	3	
PCC 304	Technology of Dyeing & Finishing Laboratory	1	
CH 331	Introductory Physical Chemistry	3	
or TE 303	Thermodynamics for Textile Engineers		
PCC 350	Introduction to Color Science and Its Applications	2	
PCC 354	Intro to Color Science Laboratory	1	
PCC 201	Impact of Industry on the Environment and Society	3	
PCC 412	Textile Chemical Analysis	2	
PCC 414	Textile Chemistry Analysis Lab	1	
PCC 442	Theory of Physico-Chemical Processes in Textiles II	3	
PCC 461	Chemistry of Polymeric Materials	3	
PCC 464	Chemistry of Polymeric Materials Laboratory	1	
BCH 451	Principles of Biochemistry	3	
or PCC 471	Chemistry of Biopolymers		
Mathematics			
MA 131	Calculus for Life and Management Sciences A	3	
or MA 141	Calculus I		
MA 231	Calculus for Life and Management Sciences B	3	
or MA 241	Calculus II		
Sciences			

CH 101	Chemistry - A Molecular Science	3
CH 102	General Chemistry Laboratory	1
CH 201	Chemistry - A Quantitative Science	3
CH 202	Quantitative Chemistry Laboratory	1
CH 221	Organic Chemistry I	3
CH 222	Organic Chemistry I Lab	1
CH 223	Organic Chemistry II	3
CH 224	Organic Chemistry II Lab	1
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
BIO 183	Introductory Biology: Cellular and Molecular Biology	4
PY 211	College Physics I	4
or PY 205/206	Physics for Engineers and Scientists I	
PY 212	College Physics II	4
or PY 208/209	Physics for Engineers and Scientists II	
MB 351	General Microbiology	3
MB 352	General Microbiology Laboratory	1
Major Electives		
Economics Elective (p. 2)		3
PCC Electives (p. 2)		5
Advised Electives (p.)		8
GEP Courses		
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 US Diversity, Equity, and Inclusion (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/)		3
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		2
GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement)		
World Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/) (verify requirement)		
Total Hours		**120**

[1] C- or better

Acad Writing Research

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

Economics Elective

Code	Title	Hours	Counts towards
EC 201	Principles of Microeconomics	3	
EC 205	Fundamentals of Economics	3	
ARE 201	Introduction to Agricultural & Resource Economics	3	

PCC Electives

Code	Title	Hours	Counts towards
PCC 274	Introduction to Forensic Science	3	

PCC 404	Introduction to the Theory and Practice of Fiber Formation	3
PCC 420	Textile Dyeing and Printing	3
PCC 466	Polymer Chemistry Laboratory	3
PCC 474	Forensic Chemistry Laboratory	3
PCC 490	Undergraduate Research in Polymer and Color Chemistry	1-6
T 497	Independent Research in Textile Engineering, Chemistry and Materials Science I	1-3

Advised Electives

Code	Title	Hours	Counts towards
Choice of advised electives depends on the health-related field (e.g. Dentistry, Medical, Optometry, Pharmacy, etc.) and entrance requirements of health professional graduate degree programs. In addition to courses on this list, you can choose any 300 or 400-level CH course.			
BEC 475	Global Regulatory Affairs for Medical Products	3	
BIO 240	Principles of Human Anatomy & Physiology (A): Nervous, Skeletal, Muscular, & Digestive Systems	4	
BIO 245	Principles of Human Anatomy & Physiology (B): Endocrine, Cardiovascular, Respiratory & Renal Systems	4	
BIO 414	Cell Biology	3	
GN 311	Principles of Genetics	4	
MB 411	Medical Microbiology	3	
MT 366	Biotextile Product Development	3	
MT 381	Medical Textile and the Regulatory Environment	3	
MT 432	Evaluation of Biotextiles	3	
ST 311	Introduction to Statistics	3	
STS/PHI 325	Bio-Medical Ethics	3	
ZO 250	Animal Anatomy and Physiology	4	

Semester Sequence

This is a sample.

First Year		
Fall Semester		**Hours**
T 101	Strategies for Success in the Wilson College of Textiles	1
PCC 101	Introduction to Polymer and Color Chemistry	2
PCC 104	Introduction to Polymer and Color Chemistry Lab	1
MA 131 or MA 141	Calculus for Life and Management Sciences A or Calculus I	3-4
CH 101	Chemistry - A Molecular Science	3
CH 102	General Chemistry Laboratory	1
ENG 101	Academic Writing and Research	4
	Hours	**16**
Spring Semester		
PCC 106	Chemistry of Colorants and Auxiliaries (Polymer Synth. Sustain. the Env.)	3
CH 221	Organic Chemistry I	3
CH 222	Organic Chemistry I Lab	1
MA 231 or MA 241	Calculus for Life and Management Sciences B or Calculus II	3-4
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
	Hours	**14**
Second Year		
Fall Semester		
TE 200	Introduction to Polymer Science and Engineering (CP)	3
CH 223	Organic Chemistry II	3
CH 224	Organic Chemistry II Lab	1
PY 211	College Physics I	4
BIO 183	Introductory Biology: Cellular and Molecular Biology	4

GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
	Hours	**16**
Spring Semester		
TE 201	Fiber Science	4
CH 201	Chemistry - A Quantitative Science	3
CH 202	Quantitative Chemistry Laboratory	1
PY 212 or PY 208	College Physics II or Physics for Engineers and Scientists II	4
Economics Elective (p. 2)		3
	Hours	**15**
Third Year		
Fall Semester		
PCC 461	Chemistry of Polymeric Materials (CP)	3
PCC 464	Chemistry of Polymeric Materials Laboratory	1
PCC 301	Technology of Dyeing and Finishing (CP)	3
PCC 304	Technology of Dyeing & Finishing Laboratory	1
TMS 212	Yarn and Fabric Formation and Properties	2
TE 303 or CH 331	Thermodynamics for Textile Engineers or Introductory Physical Chemistry	3-4
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
	Hours	**15**
Spring Semester		
PCC 350	Introduction to Color Science and Its Applications (CP)	2
PCC 354	Intro to Color Science Laboratory	1
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
Advised Electives (p.)		3
	Hours	**15**
Fourth Year		
Fall Semester		
PCC 201	Impact of Industry on the Environment and Society	3
PCC 442	Theory of Physico-Chemical Processes in Textiles II	3
PCC Electives (p. 2)		3
MB 351	General Microbiology	3
MB 352	General Microbiology Laboratory	1
Advised Electives (p.)		3
	Hours	**16**
Spring Semester		
PCC 412	Textile Chemical Analysis	2
PCC 414	Textile Chemistry Analysis Lab	1
BCH 451 or PCC 471	Principles of Biochemistry or Chemistry of Biopolymers	3-4
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		2-3
GEP US Diversity, Equity, and Inclusion (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/)		3
Advised Electives (p.)		2
	Hours	**13**
	Total Hours	**120**

Career Opportunities

Employers across the country and the world that specifically seek out our students for their unique and in-demand knowledge. From apparel and more traditional textile applications to chemical companies, plastics, cosmetics and even forensics, our graduates are anything but boxed in by this unique degree.

- Apparel: Nike, GAP, Victoria's Secret, Under Armour, HanesBrands Inc., Abercrombie & Fitch
- Forensics: FBI, SBI
- Traditional Textiles: Unifi, Milliken, ITG, Guilford Performance, LORD Corporation, PVH Corp.
- Fiber Producers/Chemical Companies: PGI, DuPont, Monsanto, Eastman Chemical Company, Cotton Inc., Teijin, Highland Industries, Honeywell
- Plastics: Plaspak Inc., IPS Adhesives
- Other: L'Oréal, Eisai Pharmaceuticals, Merc, Underwriters Laboratory, Ideal Fasteners, APJeT

A bachelor's in PCC also regularly prepares students for admission to top advanced degrees in the medical field, from Johns Hopkins University to Harvard Medical School.

Career Titles

- Color Scientist
- Dye Chemist / Textile Chemist
- Research and Development (R&D) Polymer Chemist
- Forensic Chemist
- Plant / Development Chemist
- Process Manager and/or Production Manager
- Laboratory Director
- Quality Control Chemist
- Health Care Manager

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.

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

American Association of Chemists and Colorists (https://www.aatcc.org/)