Chemical Engineering (BS): CHE/TE Dual Major

Overview

Plan Requirements

First Year		Hours
Fall Semester		
CH 101 or CH 103	Chemistry - A Molecular Science [1] or General Chemistry I for Students in Chemical Sciences	3
CH 102 or CH 104	General Chemistry Laboratory [1] or General Chemistry Laboratory I for Students in Chemical Sciences	1
E 101	Introduction to Engineering & Problem Solving [2]	1
E 115	Introduction to Computing Environments	1
MA 141	Calculus I [1]	4
Acad Writing Research (p. 2) [2]		4
	Hours	**14**
Spring Semester		
CH 201 or CH 203	Chemistry - A Quantitative Science [2] or General Chemistry II for Students in Chemical Sciences	3
CH 202 or CH 204	Quantitative Chemistry Laboratory [2] or General Chemistry Laboratory II for Students in Chemical Sciences	1
MA 241	Calculus II [1]	4
PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory [1]	4
TE 110	Computer-Based Modeling for Engineers	3
E 102	Engineering in the 21st Century	2
	Hours	**17**
Second Year		
Fall Semester		
CH 221 or CH 225	Organic Chemistry I [2] or Organic Chemistry I for Students in Chemical Sciences	3
CH 222 or CH 226	Organic Chemistry I Lab [2] or Organic Chemistry Laboratory I for Students in Chemical Sciences	1
CHE 205	Chemical Process Principles [2]	4
MA 242	Calculus III [2]	4
PY 208 & PY 209	Physics for Engineers and Scientists II and Physics for Engineers and Scientists II Laboratory	4
	Hours	**16**
Spring Semester		
CH 223 or CH 227	Organic Chemistry II or Organic Chemistry II for Students in Chemical Sciences	3
CH 224 or CH 228	Organic Chemistry II Lab or Organic Chemistry Laboratory II for Students in Chemical Sciences	1
CHE 225	Introduction to Chemical Engineering Analysis [2]	3
MA 341	Applied Differential Equations I [2]	3
TE 201	Fiber Science	4
MAE 206 or CE 214	Engineering Statics or Engineering Mechanics-Statics	3
	Hours	**17**
Third Year		
Fall Semester		
CH 315 & CH 316	Quantitative Analysis and Quantitative Analysis Laboratory	4
CHE 311	Transport Processes I [2]	3
CHE 315	Chemical Process Thermodynamics [2]	3
CHE 395	Professional Development Seminar	1
TE 301	Engineering Textile Structures I: Linear Assemblies	3
GC 120	Foundations of Graphics	3
	Hours	**17**
Spring Semester		
ST 370	Probability and Statistics for Engineers	3
CHE 312	Transport Processes II	3
CHE 316	Thermodynamics of Chemical and Phase Equilibria	3
TE 205	Analog and Digital Circuits	4
TE 302	Textile Manufacturing Processes and Systems II	4
	Hours	**17**
Fourth Year		
Fall Semester		
TE 401	Textile Engineering Design I	4
CHE 446	Design and Analysis of Chemical Reactors	3
Select one of the following Economics Courses:		3
ARE 201	Introduction to Agricultural & Resource Economics	
ARE 201A	Introduction to Agricultural & Resource Economics	
EC 201	Principles of Microeconomics	
EC 205	Fundamentals of Economics	
	Hours	**10**
Spring Semester		
TE 402	Textile Engineering Design II	4
TE 404	Textile Engineering Quality Improvement	3
TE 424	Textile Engineering Quality Improvement Laboratory	1
	Hours	**8**
Fifth Year		
CHE 330	Chemical Engineering Lab I	4
CHE 435	Process Systems Analysis and Control	3
PCC 301	Technology of Dyeing and Finishing	3

PCC 304	Technology of Dyeing & Finishing Laboratory	1
	Hours	**11**
	Total Hours	**127**

[1] A grade of C or higher is required.
[2] A grade of C- or higher is required.

Code	Title	Hours	Counts towards
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 Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3	
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		3	
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		**17**	

Acad Writing Research

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

Semester Sequence

To see more about what you will learn in this program, visit the Learning Outcomes website (https://apps.oirp.ncsu.edu/pgas/)!

Critical Path Courses- Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.

First Year		
Fall Semester		**Hours**
CH 101	Chemistry - A Molecular Science [1,6]	3
CH 102	General Chemistry Laboratory [1,6]	1
E 101	Introduction to Engineering & Problem Solving [2]	1
E 115	Introduction to Computing Environments	1
ENG 101	Academic Writing and Research [2]	4
MA 141	Calculus I [1]	4
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
	Hours	**15**
Spring Semester		
CH 201	Chemistry - A Quantitative Science [2,6]	3
CH 202	Quantitative Chemistry Laboratory [6]	1
MA 241	Calculus II [1]	4
PY 205	Physics for Engineers and Scientists I [1]	3
PY 206	Physics for Engineers and Scientists I Laboratory [1]	1
TE 110	Computer-Based Modeling for Engineers	3
E 102	Engineering in the 21st Century	2
	Hours	**17**
Second Year		
Fall Semester		
CH 221	Organic Chemistry I [2,3,7]	3
CH 222	Organic Chemistry I Lab [7]	1
CHE 205	Chemical Process Principles (CP) [2]	4
MA 242	Calculus III [2]	4
PY 208	Physics for Engineers and Scientists II	3
PY 209	Physics for Engineers and Scientists II Laboratory	1
	Hours	**16**
Spring Semester		
TE 201	Fiber Science	4
MAE 206 or CE 214	Engineering Statics or Engineering Mechanics-Statics	3
MA 341	Applied Differential Equations I [2]	3
CH 223	Organic Chemistry II [7]	3
CH 224	Organic Chemistry II Lab [7]	1
CHE 225	Introduction to Chemical Engineering Analysis [2]	3
	Hours	**17**

Third Year		
Fall Semester		
CH 315	Quantitative Analysis	3
CH 316	Quantitative Analysis Laboratory	1
GC 120	Foundations of Graphics	3
CHE 311	Transport Processes I (CP) [2]	3
CH 315	Quantitative Analysis (CP) [2]	3
CHE 395	Professional Development Seminar	1
TE 301	Engineering Textile Structures I: Linear Assemblies	3
	Hours	**17**
Spring Semester		
TE 302	Textile Manufacturing Processes and Systems II	4
ST 370	Probability and Statistics for Engineers	3
CHE 312	Transport Processes II	3
CHE 316	Thermodynamics of Chemical and Phase Equilibria	3
TE 205	Analog and Digital Circuits [5]	4
	Hours	**17**
Fourth Year		
Fall Semester		
CHE 446	Design and Analysis of Chemical Reactors	3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
TE 401	Textile Engineering Design I	4
Select one of the following Economics Courses:		3
EC 205	Fundamentals of Economics	
EC 201	Principles of Microeconomics	
ARE 201	Introduction to Agricultural & Resource Economics	
	Hours	**16**
Spring Semester		
TE 402	Textile Engineering Design II [6]	4
TE 404	Textile Engineering Quality Improvement	3
TE 424	Textile Engineering Quality Improvement Laboratory	1
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
	Hours	**14**
Fifth Year		
Fall Semester		
CHE 330	Chemical Engineering Lab I	4
CHE 435	Process Systems Analysis and Control	3
PCC 301	Technology of Dyeing and Finishing	3
PCC 304	Technology of Dyeing & Finishing Laboratory	1
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
	Hours	**15**
	Total Hours	**144**

1 Grade of C (2.0) or higher required.
2 Minimum grade of C- required.
3 CH 221 will replace TE 200 (in the Textile Engineering curriculum)
4 CHE 315/ 316 will replace TE 303 (in the Textile Engineering curriculum)
5 TE 401/402 will replace CHE 450/451 (in the Chemical Engineering curriculum)6 CH 225/226 may substitute for CH 221/222 and CH 227/228 may substitute for CH 223/224.
6 CH 103/104 may substitute for CH 101/102 and CH 203/204 may substitute for CH 201/202
7 CH 225/226 may substitute for CH 221/222 and CH 227/228 may substitute for CH 223/224.

Career Opportunities

Careers in chemical engineering are sometimes exciting, always demanding, and ultimately provide a sense of accomplishment and achievement. Graduates find employment in sub-disciplines such as production, technical service, sales, management and administration; research and development; and consulting and teaching. Students desiring careers in teaching, research, or consulting are encouraged to continue their education and pursue a graduate degree (consult the Graduate Catalog). The undergraduate curriculum also provides strong preparation for graduate study in a wide range of professional specialties, and chemical engineering graduates often pursue careers in the medical sciences, business management, and law.

Career Titles

- Agricultural Engineer
- Automotive Engineer
- Biochemist
- Biomedical Engineer
- Chemical Engineer
- Chemist
- Dairy Technologist
- Electronics Engineer
- Engineering Professor
- Environmental Engineer
- Fire Prevention Engineer
- Industrial Air Pollution Analyst
- Industrial Waste Inspector
- Laboratory Tester
- Materials Engineer
- Materials Scientist
- Nanosystems Engineers
- Non-Destructive Testing Specialists
- Nuclear Engineer
- Nuclear Fuels Research Engineer
- Occupational Safety & Health Inspector
- Perfumer

- Petroleum Engineer
- Physicist
- Physics Professor
- Product Safety Engineer
- Quality Control Managers
- Radiation Protection Engineer
- Safety Inspector
- Sales Engineers
- Sales Representative (Chemicals & Drugs)
- Soil Engineer
- Solar Energy Systems Engineers
- Sustainability Specialists
- Toxicologist
- Water/Wastewater Engineers

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 Institute of Chemical Engineers (https://www.aiche.org/)
American Chemical Society (https://www.acs.org/)
American Oil Chemists' Society (http://www.aocs.org/)
National Society of Professional Engineers (https://www.nspe.org/)