Chemical Engineering (BS): CHE/TE Dual Major

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

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 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/)		3	
GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement)			
Foreign Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-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

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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.