Overview of Program Tracks

We provide suggested 'tracks' for students to follow who wish to perform specializations in particular areas. The tracks only provide suggestions for students to follow in choosing electives – they do not relax or add to the requirements for the B.S. Chemical Engineering degree. Students are not required to follow one of these tracks.

Biological Engineering Track

The biological engineering track aims at educating students in the basics of cell and molecular biology and the application of engineering principles in biological systems. The ultimate goal is to use quantitative engineering concepts and tools to design biological processes, biological products and novel therapeutics e.g. naturally-inspired products, anti-inflammatory drugs, biomaterials for drug/protein delivery, cell-based devices for gene/protein delivery or engineered tissues for organ replacement.

Materials Engineering Track

The materials engineering track aims to prepare students for careers related to the design, testing, and use of novel and/or complex materials for a variety of technological applications. This emphasis is appropriate to the increasing role of product design in the chemical engineering profession.

Standard Program of Study

Freshman

Fall		Spring	
CHE 107 General Chemistry I	4	CHE 108 General Chemistry II	4
EAS 140 Engineering Solutions	3	PHY 107 General Physics I	4
MTH 141 Calculus I	4	MTH 142 Calculus II	4
Gen Ed	3	EAS 230 Higher-level Language	3
Gen Ed	3	Gen Ed	3
TOTAL	**17**	TOTAL	**18**

Sophomore

Fall		Spring	
CE 212 Fundamental Principles of	4	CE 304 CE Thermodynamics	4
MTH 241 Calculus III	4	MTH 306 Differential Equations	4
CHE 201 Organic Chemistry I	5	CHE 204 Organic II or BIO 205 Func	3
PHY 108 General Physics II	4	BIO 201 Cell Biology	4
PHY 158 General Physics II Lab	1	Gen Ed	3
TOTAL	**18**	TOTAL	**18**

Junior

Fall		Spring	
CE 317 Transport Processes I	4	CE 318 Transport Processes II	4
CE 327 CE Lab I	2	CE 328 CE Lab II	2
CHE 334 Physical Chemistry for C	3	CE 433 Materials Science & Enginee	3
CE 329 Chemical Reaction Engine	3	CE 407 Separations	3
TE 200+	3	TE 300+	3
TOTAL	**15**	TOTAL	**15**

Senior

Fall		Spring	
CE 404 CE Product Design	4	CE 408 CE Plant Design	4
CE 427 CE Lab III	2	CE 428 CE Lab IV	2
CE 434 Chemical Systems and Co	3	CBE TE	3
CBE TE	3	Gen Ed	3
Gen Ed	3	Gen Ed	3
TOTAL	**15**	TOTAL	**15**

TOTAL CREDITS 131

Course Catalog: For more detailed information regarding the courses, please visit the Undergraduate Catalog:
http://undergrad-catalog.buffalo.edu

Biological Engineering Track
(Standard)

Freshman

Fall		Spring	
CHE 107 General Chemistry I	4	CHE 108 General Chemistry II	4
EAS 140 Engineering Solutions	3	PHY 107 General Physics I	4
MTH 141 Calculus I	4	MTH 142 Calculus II	4
Gen Ed	3	EAS 230 Higher-level Language	3
Gen Ed	3	Gen Ed	3
TOTAL	**17**	TOTAL	**18**

Sophomore

Fall		Spring	
CE 212 Fundamental Principles of	4	CE 304 CE Thermodynamics	4
MTH 241 Calculus III	4	MTH 306 Differential Equations	4
CHE 201 Organic Chemistry I	5	BIO 205 Fundamentals of Biological	3
PHY 108 General Physics II	4	BIO 201 Cell Biology	4
PHY 158 General Physics II Lab	1	Gen Ed	3
TOTAL	**18**	TOTAL	**18**

Junior

Fall		Spring	
CE 317 Transport Processes I	4	CE 318 Transport Processes II	4
CE 327 CE Lab I	2	CE 328 CE Lab II	2
CHE 334 Physical Chemistry for C	3	CE 433 Materials Science & Enginee	3
CE 329 Chemical Reaction Engine	3	CE 407 Separations	3
PGY 300 Human Physiology	3	CE 446 Biochemical Engineering	3
TOTAL	**15**	TOTAL	**15**

Senior

Fall		Spring	
CE 404 CE Product Design	4	CE 408 CE Plant Design	4
CE 427 CE Lab III	2	CE 428 CE Lab IV	2
CE 434 Chemical Systems and Co	3	Biological CBE TE (see below)	3
CE 447 Bio Transport & Kinetics	3	Gen Ed	3
Gen Ed	3	Gen Ed	3
TOTAL	**15**	TOTAL	**15**

TOTAL CREDITS
131

Biological Engineering Track
(Pre-Med)

Freshman

Fall		Spring	
CHE 107 General Chemistry I	4	CHE 108 General Chemistry II	4
EAS 140 Engineering Solutions	3	PHY 107 General Physics I	4
MTH 141 Calculus I	4	MTH 142 Calculus II	4
Gen Ed	3	EAS 230 Higher-level Language	3
Gen Ed	3	Gen Ed	3
TOTAL	**17**	TOTAL	**18**

Sophomore

Fall		Spring	
CE 212 Fundamental Principles of	4	CE 304 CE Thermodynamics	4
MTH 241 Calculus III	4	MTH 306 Differential Equations	4
CHE 201 Organic Chemistry I	5	BIO 205 Fundamentals of Biological	3
PHY 108 General Physics II	4	BIO 201 Cell Biology	4
PHY 158 General Physics II Lab	1	Gen Ed	3
TOTAL	**18**	TOTAL	**18**

Junior

Fall		Spring	
CE 317 Transport Processes I	4	CE 318 Transport Processes II	4
CE 327 CE Lab I	2	CE 328 CE Lab II	2
CHE 334 Physical Chemistry for C	3	CE 433 Materials Science & Enginee	3
CE 329 Chemical Reaction Engine	3	CE 407 Separations	3
PGY 300 Human Physiology	3	CE 446 Biochemical Engineering	3
		CHE 204 Organic Chemistry	3
TOTAL	**15**	TOTAL	**18**

Senior

Fall		Spring	
CE 404 CE Product Design	4	CE 408 CE Plant Design	4
CE 427 CE Lab III	2	CE 428 CE Lab IV	2
CE 434 Chemical Systems and Co	3	Biological CBE TE (see below)	3
CE 447 Bio Transport & Kinetics	3	Gen Ed	3
Gen Ed	3	Gen Ed	3
TOTAL	**15**	TOTAL	**15**

TOTAL CREDITS
134

Biological CBE Technical Electives

CE 448	Cellular and Molecular Bioengineering
CE 449	Biological Systems Engineering
CE 450	Protein Engineering

Note: The CBE department periodically offers "Special Topics" courses that may serve as appropriate Biological CBE Technical Electives.

Materials Engineering Track

Freshman

Fall		Spring	
CHE 107 General Chemistry I	4	CHE 108 General Chemistry II	4
EAS 140 Engineering Solutions	3	PHY 107 General Physics I	4
MTH 141 Calculus I	4	MTH 142 Calculus II	4
Gen Ed	3	EAS 230 Higher-level Language	3
Gen Ed	3	Gen Ed	3
TOTAL	**17**	TOTAL	**18**

Sophomore

Fall		Spring	
CE 212 Fundamental Principles of	4	CE 304 CE Thermodynamics	4
MTH 241 Calculus III	4	MTH 306 Differential Equations	4
CHE 201 Organic Chemistry I	5	CHE 204 Organic II or BIO 205 Func	3
PHY 108 General Physics II	4	BIO 201 Cell Biology	4
PHY 158 General Physics II Lab	1	Gen Ed	3
TOTAL	**18**	TOTAL	**18**

Junior

Fall		Spring	
CE 317 Transport Processes I	4	CE 318 Transport Processes II	4
CE 327 CE Lab I	2	CE 328 CE Lab II	2
CHE 334 Physical Chemistry for C	3	CE 433 Materials Science & Enginee	3
CE 329 Chemical Reaction Engine	3	CE 407 Separations	3
CHE 321 Inorganic Chemistry I	3	Materials CBE TE (see below)	3
TOTAL	**15**	TOTAL	**15**

Senior

Fall		Spring	
CE 404 CE Product Design	4	CE 408 CE Plant Design	4
CE 427 CE Lab III	2	CE 428 CE Lab IV	2
CE 434 Chemical Systems and Co	3	Materials CBE TE (see below)	3
Materials CBE TE (see below)	3	Gen Ed	3
Gen Ed	3	Gen Ed	3
TOTAL	**15**	TOTAL	**15**

TOTAL CREDITS
131

Materials CBE Technical Electives

CE 410	Molecular Modeling
CE 419	Alternative Fuels
CE 435	Introduction to Polymers
CE 438	Electrochemical Power Sources: Design, Function, and Selection
CE 456	Introduction to Aerosol Science
CE 457	Colloid and Surface Phenomena

Note: The CBE department periodically offers "Special Topics" courses that may serve as appropriate Materials CBE Technical Electives.