# A SUGGESTED COURSE PLAN FOR:

## CHEMICAL ENGINEERING

### FIRST YEAR

**FALL SEMESTER**
- **GE A**
- **WRIT 150**
- **MATH 125 (GE F)**
- **CHEM 105aL (GE E)**
- **ENGR 102**

**SPRING SEMESTER**
- **CHE 120** (MATH 125, CHEM 105aL)
- **CHE 205** (MATH 125)
- **MATH 126 or MATH 129**
- **CHEM 105bL**
- **PHYS 151L (GE E)**

### SECOND YEAR

**FALL SEMESTER**
- **CHE 330**
- **CHEM 300L**
- **MATH 226 or MATH 229**
- **PHYS 152L**
- **OPTIONAL ELECTIVE**

**SPRING SEMESTER**
- **GE B**
- **CHEM 322aL**
- **MATH 245**
- **APPROVED ELECTIVE**
- **CHE 350**

### THIRD YEAR

**FALL SEMESTER**
- **GE C**
- **TECHNICAL ELECTIVE**
- **CHEM 430**
- **CHE 405**
- **CHE 442**

**SPRING SEMESTER**
- **GE B**
- **CHE 444aL**
- **APPROVED ELECTIVE**
- **CHE 443**
- **CHE 476**

### FOURTH YEAR

**FALL SEMESTER**
- **GE D**
- **CHE 444bL**
- **CHE 445**
- **CHE 485**
- **APPROVED ELECTIVE**
- **WRIT 340**

**SPRING SEMESTER**
- **GE C**
- **CHE 446**
- **CHE 460L**
- **CHEMISTRY ELECTIVE**
- **OPTIONAL ELECTIVE**
- **OPTIONAL ELECTIVE**

### MATHEMATICS (16 UNITS)
- **MATH 125**: Calculus I
- **MATH 126** or **MATH 129**: Calculus II
- **MATH 226** or **MATH 229**: Calculus III
- **MATH 245**: Mathematics of Phys. and Engr.

### PHYSICS (8 UNITS)
- **PHYS 151L**: Mechanics and Thermodynamics
- **PHYS 152L**: Electricity and Magnetism

### CHEMISTRY (24 UNITS)
- **CHEM 105AL**: General Chemistry
- **CHEM 105BL**: General Chemistry
- **CHEM 300L**: Analytical Chemistry
- **CHEM 322AL**: Organic Chemistry
- **CHEM 430**: Physical Chemistry: Thermodynamics & Kinetics
- **CHEMISTRY ELECTIVE**: CHEM 322BL or 431

### GENERAL EDUCATION ELECTIVE: CHEM 322BL or 431

### WRITING (7 UNITS)
- **WRIT 150**: Writing and Critical Reasoning
- **WRIT 340**: Advanced Writing

### ENGINEERING (54-57 UNITS)
- **CHE 120**: Intro. to Chemical Engineering
- **CHE 205**: Numerical Methods in Chemical Engineering
- **CHE 330**: Chemical Engr. Thermodynamics
- **CHE 350**: Intro. to Separation Processes
- **CHE 345**: Probability and Statistics for CHE
- **CHE 441**: Chemical Reactor Analysis
- **CHE 443**: Viscous Flow
- **CHE 444A**: Chemical Engineering Lab
- **CHE 444B**: Chemical Engineering Lab
- **CHE 445**: Heat Transfer in CHE Processes
- **CHE 446**: Mass Transfer in CHE Processes
- **CHE 460L**: Chem. Proc. Dynamics & Control
- **CHE 476**: Chemical Engineering Materials
- **CHE 480**: Chem. Process and Plant Design
- **CHE 485**: Computer Aided Process Design
- **ENGR 102**: Engineering Freshman Academy

### TECHNICAL ELECTIVE
- Any upper-division CHE course that is not already required.

### APPROVED ELECTIVES
- 8-9 units of approved electives including CE 205 (2), EE 438L (3), and ESE 480 (3) or BUAD 301 (3) or other courses with department approval.

### SPECIAL NOTES
- Courses with this symbol may be satisfied with AP, IB or A-Level exams. See page 17 for more information.

- GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your advisor for detailed assistance.

- OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.

- TECHNICAL ELECTIVE: Any upper-division CHE course that is not already required.

- APPROVED ELECTIVES: 8-9 units of approved electives including CE 205 (2), EE 438L (3), and ESE 480 (3) or BUAD 301 (3) or other courses with department approval.
# CHEMICAL (BIOCHEMICAL)

## FIRST YEAR

### FALL SEMESTER
- **GE A:** WRIT 150  
- **MATH 125 (GE F):** CHEM 105aL  
- **CHE 120 (MATH 125):** ENGR 102

### SPRING SEMESTER
- **CHE 205 (MATH 126 or MATH 129):** MATH 126 or MATH 129  
- **CHEM 105bL:** PHYS 151L

## SECOND YEAR

### FALL SEMESTER
- **CHE 330:** CHEM 300L  
- **MATH 226 or MATH 229:** PHYS 152L

### SPRING SEMESTER
- **WRIT 340:** CHEM 322aL

## THIRD YEAR

### FALL SEMESTER
- **GE C:** BISC 320L (GE D)  
- **CHEM 430:** CHEM 330L  
- **CHE 442:** CHEM 443

### SPRING SEMESTER
- **WRIT 340:** BISC 300L  
- **CHE 443:** CHEM 485

## FOURTH YEAR

### FALL SEMESTER
- **BIOELECTIVE:** CHE 444bL or CHE 444L  
- **CHE 405 or ISE 460:** CHEM 489

### SPRING SEMESTER
- **GE C:** CHE 446

## MATHEMATICS (18 UNITS)
- **MATH 125:** Calculus I  
- **MATH 126 or MATH 129:** Calculus II  
- **MATH 226 or MATH 229:** Calculus III  
- **MATH 245:** Mathematics of Phys. and Engr.

## PHYSICS (8 UNITS)
- **PHYS 151L:** Mechanics and Thermodynamics  
- **PHYS 152L:** Electricity and Magnetism

## CHEMISTRY (20 UNITS)
- **CHEM 105aL:** General Chemistry  
- **CHEM 105bL:** General Engineering  
- **CHEM 300L:** Analytical Chemistry  
- **CHEM 322aL:** Organic Chemistry  
- **CHEM 430:** Physical Chemistry: Thermodynamics & Kinetics

## BIOLOGY (12 UNITS)
- **BISC 300L:** Intro. to Microbiology  
- **BISC 320L:** Molecular Biology  
- **BISC 330L:** Biochemistry

## GENERAL EDUCATION (32 UNITS)
- **GE A:** The Arts (1 Course)  
- **GE B:** Humanistic Inquiry (2 Courses)  
- **GE C:** Social Analysis (2 Courses)  
- **GE D:** Life Sciences (1 Course)  
- **GE E:** Physical Sciences (1 Course)

## SPECIAL NOTES
- Courses with this symbol may be satisfied with AP, IB or A-Level exams. See page 17 for more information.
- **GE:** Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied with AP, IB or A-Level exams. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your academic advisor.
- **OPTIONAL ELECTIVES:** Consult with your academic advisor to explore optional elective courses. These courses are not required.
- **BIOELECTIVE:** Approved Bioengineering course or BISC 403
- **BISC 403:** Must have 48 engineering units in order to register for this class
# 2016-17 Suggested Course Plan

## General Education (32 Units)

**GE A** The Arts (1 Course)

**GE B** Humanistic Inquiry (2 Courses)

**GE C** Social Analysis (2 Courses)

**GE D** Life Sciences (1 Course)

**GE E** Physical Sciences (1 Course)

**GE F** Quantitative Reasoning (1 Course)

**GE G, H** Global Perspectives (2 Courses)*

**GESM** General Education Seminar (1 Course)*

## Chemistry (20 Units)

**CHEM 101A:** General Chemistry

**CHEM 101B:** General Chemistry

**CHEM 101C:** Analytical Chemistry

**CHEM 101D:** Organic Chemistry

**CHEM 101E:** Physical Chemistry: Thermodynamics & Kinetics

## Mathematics (16 Units)

**MATH 125:** Calculus I

**MATH 126** or **MATH 129:** Calculus II

**MATH 226** or **MATH 229:** Calculus III

**MATH 245:** Mathematics of Phys. and Engr.

## Physics (8 Units)

**PHYS 151L:** Mechanics and Thermodynamics

**PHYS 152L:** Electricity and Magnetism

## Writing (7 Units)

**WRIT 150:** Writing and Critical Reasoning

**WRIT 340:** Advanced Writing

## Engineering (32 Units)

**CE 453:** Water Quality Control

**CE 463L:** Water Chemistry and Analysis

**CHE 101:** Intro to Chemical Engineering

**CHE 205:** Numerical Methods in Chemical Engineering

**CHE 330:** Chemical Engr. Thermodynamics

**CHE 350:** Intro to Separation Processes

**CHE 405:** Prob. and Stats. for Chem. Engr.

**CHE 443:** Chemical Reactor Analysis

**CHEM 101A:** Viscous Flow

**CHEM 444AL:** Chem. Engineering Laboratory

**CHE 445:** Heat Transfer in Chem Processes

**CHEM 446L:** Mass Transfer in Chem Processes

**CHEM 460L:** Chemical Process Dynamics

**CHEM 476:** Chemical Engineering Materials

**CHEM 480:** Chem. Process and Plant Design

**CHEM 485:** Computer Aided Process Design

**CHEM 486:** Design of Environ. Benign Plants

**CHEM 488:** Air Pollution Fundamentals

**CHEM 489:** Air Pollution Control

**ENGR 102:** Engineering Freshman Academy

**ISE 460 or BUAD 301:** Technical Entrepreneurship

**PTE 463L:** Trans. Processes in Porous Media

## SPECIAL NOTES

Courses with this symbol may be satisfied with AP, IB or A-Level exams. See page 17 for more information.

**GE:** Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your advisor for detailed assistance.

**OPTIONAL ELECTIVES:** Consult with your academic advisor to explore optional elective courses. These courses are not required.
A SUGGESTED COURSE PLAN FOR:
CHEMICAL (NANOTECHNOLOGY)

FIRST YEAR

FALL SEMESTER

| GE A | WRIT 150 | 4 |
| SPRING SEMESTER |
| CHE 120 | MATH 125 | 3 |
| CHEM 205 | MATH 126 or MATH 129 | 3 |

SECOND YEAR

FALL SEMESTER

| GE C | CHEM 330 | 4 |
| SPRING SEMESTER |
| CHEM 322aL | CHEM 300L | 4 |
| CHEM 444aL | CHEM 443 | 4 |

THIRD YEAR

FALL SEMESTER

| GE D | CHEM 453 | 4 |
| SPRING SEMESTER |
| CHEM 444bL | CHEM 445 | 4 |

FOURTH YEAR

FALL SEMESTER

| GE B | CHE 446 | 4 |
| SPRING SEMESTER |
| CHE 446L | CHE 445L | 2 |

MATHEMATICS (16 UNITS)

MATH 125: Calculus I
MATH 126 or MATH 129: Calculus II
MATH 226 or MATH 229: Calculus III
MATH 243: Mathematics of Phys. and Engr.

PHYSICS (8 UNITS)

PHYS 151L: Mechanics and Thermodynamics
PHYS 152L: Electricity and Magnetism

CHEMISTRY (24 UNITS)

CHEM 105AL: General Chemistry
CHEM 105BL: General Chemistry
CHEM 300L: Analytical Chemistry
CHEM 322AL: Organic Chemistry
CHEM 430: Physical Chemistry: Thermodynamics & Kinetics
CHEM 453: Advanced Inorganic Chemistry

GENERAL EDUCATION (32 UNITS)

GE A: The Arts (1 Course)
GE B: Humanistic inquiry (2 Courses)
GE C: Social Analysis (2 Courses)
GE D: Life Sciences (1 Course)
GE E: Physical Sciences (1 Course)
GE F: Quantitative Reasoning (1 Course)
GE G, H: Global Perspectives (2 Courses)*
GESM: General Education Seminar (1 Course)*

WRITING (7 UNITS)

WRIT 150: Writing and Critical Reasoning
WRIT 340: Advanced Writing

ENGINEERING (54 UNITS)

CHE 120: Intro. to Chemical Engineering
CHE 205: Numerical Methods in Chemical Engineering
CHE 330: Chemical Engnr. Thermodynamics
CHE 350: Intro. to Separation Processes
CHE 391: Intro. to Nanotechnology Research
CHE 405: Applications of Prob. & Stats. for Che or ISE 460: Engineering Economy or BUAD 301: Technical Entrepreneurship
CHE 442: Chemical Reactor Analysis
CHE 443: Viscous Flows
CHE 444AL: Chemical Engineering Lab
CHE 445: Heat Transfer in Che Processes
CHE 446: Mass Transfer in CHE Processes
CHE 460L: Chemical Process Dynamics & Control
CHE 480: Chem. Process and Plant Design
CHE 485: Comp.-Aided Chemical Process Design
CHE 487: Nanotech and Nanoscale Engineering
CHE 491: Nanotech Research for Undergrads
ENGR 102: Engineering Freshman Academy

* SPECIAL NOTES

Courses with this symbol may be satisfied with AP, IB or A-Level exams. See page 17 for more information.

GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 18-17 for more information and consult your advisor for detailed assistance.

OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.

NANOTECH. ELECTIVE: EE/MASC 438L, CHE 489, or CHE/PTE 463L.

CHE 391, 491: Technical electives may be taken in place of these courses. Contact the department for approved courses.
A SUGGESTED COURSE PLAN FOR:

CHEMICAL (PETROLEUM)

FIRST YEAR

FALL SEMESTER

GE A

WRIT 150

4

MATH 125 (GE F)

4

CHEM 105aL (GE E)

4

ENGR 102

2

SPRING SEMESTER

CHE 120

(MATH 125, CHEM 105aL)

3

CHE 205

MATH 125

3

MATH 126 or MATH 129

4

CHEM 105bL

CHEM 105aL

4

PHYS 151L

( GE E)

4

SECOND YEAR

FALL SEMESTER

CHE 330

4

CHEM 322aL

4

MATH 225 or MATH 229

4

PHYS 152L

MATH 125 (GE E)

4

WRIT 340

3

SPRING SEMESTER

CHE 350

CHEM 300L

CHEM 105L

CHE 120

GE B

CHEM 245

CHE 350

CHEM 105L

CHE 476

CHEM 322L

3

3

3

GE B

GE C

GE D

GE E

GE F

GE G

GE H

GENERAL EDUCATION SEMINAR (1 COURSE)*

PHYSICS (8 UNITS)

PHYS 151L: Mechanics and Thermodynamics

PHYS 152L: Electricity and Magnetism

MATHEMATICS (16 UNITS)

MATH 125: Calculus I

MATH 126 or MATH 129: Calculus II

MATH 225: Mathematics of Phys. and Engr.

CHEMISTRY (24 UNITS)

CHEM 105aL: General Chemistry

CHEM 105bL: General Chemistry

CHEM 300L: Analytical Chemistry

CHEM 322aL: Organic Chemistry

CHEM 430: Physical Chemistry: Thermodynamics & Kinetics

CHEMISTRY ELECTIVE: CHEM 322BL or 431

GENERAL EDUCATION ELECTIVE: CHEM 322BL or 431

GENERAL EDUCATION (32 UNITS)

GE A: The Arts (1 Course)

GE B: Humanistic Inquiry (2 Courses)

GE C: Social Analysis (2 Courses)

GE D: Life Sciences (1 Course)

GE E: Physical Sciences (1 Course)

GE F: Quantitative Reasoning (1 Course)

GE G, H: Global Perspectives (2 Courses)*

GESM: General Education Seminar (1 Course)*

WRITING (7 UNITS)

WRIT 150: Writing and Critical Reasoning

WRIT 340: Advanced Writing

ENGINEERING (60 UNITS)

CHE 120: Intro. to Chemical Engineering

CHE 205: Numerical Methods in Chemical Engineering

CHE 330: Chemical Engr. Thermodynamics

CHE 350: Intro. to Separation Processes

CHE 405: Probability and Statistics for CHE

CHE 442: Chemical Reactor Analysis

CHE 443: Viscous Flow

CHE 444AL: Chemical Engineering Lab

CHE 444BL: Chemical Engineering Lab

CHE 445: Heat Transfer in CHE Processes

CHE 446: Mass Transfer in CHE Processes

CHE 460L: Chemical Process Dynamics

CHE 476: Chemical Engineering Materials

CHE 480: Chem. Process and Plant Design

CHE 485: Computer Aided Process Design

ENGR 102: Engineering Freshman Academy

ISE 460: Engineering Economy

or BUAD 301: Technical Entrepreneurship

PTE 461: Formulation Evaluation

PTE 463L: Trans. Processes in Porous Media

PTE 464L: Petroleum Reservoir Engineering

PTE 465L: Drill. Tech. & Subsurface Meth.

* SPECIAL NOTES

Courses with this symbol may be satisfied with AP, IB or A-Level exams. See page 17 for more information.

GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your academic advisor for detailed assistance.

OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.
# Chemical (Polymers/Materials) Program

## First Year

### Fall Semester
- GE A: 4 units
- WRT 150: 4 units
- MATH 125 (GE F): 4 units
- CHEM 105aL (GE E): 4 units
- ENGR 102: 2 units

### Spring Semester
- CHE 120: MATH 125 or CHEM 105aL: 3 units
- CHE 205: MATH 125: 3 units
- MATH 126 or MATH 129: 4 units
- CHEM 105bL: 4 units
- PHYS 151L: 4 units

## Second Year

### Fall Semester
- CHE 330: 3 units
- CHEM 300L: 4 units
- MATH 226 or MATH 229: 4 units
- PHYS 152L: 4 units
- OPTIONAL ELECTIVE: 3 units

### Spring Semester
- GE B: 4 units
- CHEM 322aL: CHEM 105aL: 4 units
- MATH 245: 4 units
- WRIT 340: 4 units
- CHE 350: CHEM 105aL: 3 units

## Third Year

### Fall Semester
- POLYMERS/MATERIALS SCI. ELECTIVE: 3 units
- CHEM 430: PHYS 151L: 4 units
- CHE 442: 3 units
- CHE 472: 3 units
- GE C: 4 units
- OPTIONAL ELECTIVE: 3 units

### Spring Semester
- GE B: 4 units
- CHEMISTRY ELECTIVE: 4 units
- CHE 444aL: CHEM 442 or 443 or CHEM 450: 4 units
- CHE 443: CHEM 442 or 443: 3 units
- CHE 476 or MASC 310: 3 units

## Fourth Year

### Fall Semester
- GE D: 4 units
- CHE 444bL: CHEM 442 or 443: 3 units
- CHE 445: CHEM 442 or 443: 2 units
- CHE 485: 3 units
- POLYMERS/MATERIALS SCI. ELECTIVE: 3 units
- CHE 405 or IS 460 or BUAD 301: 3 units

### Spring Semester
- GE C: 4 units
- CHE 446: CHEM 446 or 447: 4 units
- CHE 460L: CHEM 446 or 447: 2 units
- CHE 480: 3 units
- POLYMERS/MATERIALS SCI. ELECTIVE: 3 units
- MASC 350L: 3 units

### Mathematics (16 Units)
- MATH 125: Calculus I
- MATH 126 or MATH 129: Calculus II
- MATH 220 or MATH 229: Calculus III
- MATH 243: Mathematics of Phys. and Engr.

### Physics (8 Units)
- PHYS 151L: Mechanics and Thermodynamics
- PHYS 152L: Electricity and Magnetism

### Chemistry (24 Units)
- CHEM 105aL: General Chemistry
- CHEM 105bL: General Chemistry
- CHEM 300L: Analytical Chemistry
- CHEM 322aL: Organic Chemistry
- CHEM 430: Physical Chemistry: Thermodynamics & Kinetics
- CHEMISTRY ELECTIVE: CHEM 322bL or 431

### General Education (32 Units)
- GE A: The Arts (1 Course)
- GE B: Humanistic inquiry (2 Courses)
- GE C: Social Analysis (2 Courses)
- GE D: Life Sciences (1 Course)
- GE E: Physical Sciences (1 Course)
- GE F: Quantitative Reasoning (1 Course)
- GE G, H: Global Perspectives (2 Courses)*
- GESM General Education Seminar (1 Course)*

### Writing (7 Units)
- WRIT 150: Writing and Critical Reasoning
- WRIT 340: Advanced Writing

### Engineering (57 Units)
- CHE 120: Intro. to Chemical Engineering
- CHE 205: Numerical Methods in Chemical Engineering
- CHE 330: Chemical Engr. Thermodynamics
- CHE 350: Intro. to Separation Processes
- CHE 405: Probability and Statistics for CHE or IS 460: Engineering Economy or BUAD 301: Technical Entrepreneurship
- CHE 442: Chemical Reactor Analysis
- CHE 443: Viscous Flow
- CHE 444aL: Chemical Engineering Lab
- CHE 445: Heat Transfer in CHE Processes
- CHE 446: Mass Transfer in CHE Processes
- CHE 460L: Chemical Process Dynamics
- CHE 472: Polymer Science & Engineering
- CHE 476: Chemical Engineering Materials or MASC 310: Materials Behavior and Processing
- CHE 480: Chem. Process and Plant Design
- CHE 485: Computer Aided Process Design
- ENGR 102: Engineering Freshman Academy
- POLYMER / MATERIALS ELECTIVES

### Special Notes
- Courses with this symbol may be satisfied with AP, IB or A-Level exams. See page 17 for more information.
- GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your academic advisor for detailed assistance.
- OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.
- POLYMER/MAT ELECTIVES: Select 9 units from BME 410, CHE 474L, 475, 477, 487, EE 438L, or MASC 440.
# A Suggested Course Plan for: Chemical (Sustainable Energy)

## First Year

### Fall Semester
- **GE A**
- **WRIT 150**
- **MATH 125 (GE F)**
- **CHEM 105aL (GE E)**
- **ENGR 102**

### Spring Semester
- **CHE 120** (Math 125, Chem 105aL)
- **CHE 205**
- **CHEM 125 or MATH 129** (Math 125, Chem 105aL)
- **CHEM 105bL**
- **PHYS 151L (GE E)**

## Second Year

### Fall Semester
- **CHE 330** (Math 129, Chem 105aL)
- **CHEM 300L**
- **MATH 226 or MATH 129** (Math 125, Chem 105aL)
- **PHYS 152L**
- **OPTIONAL ELECTIVE**

### Spring Semester
- **GE B**
- **CHEM 322aL**
- **CHEM 245**
- **CHE 350**
- **WRIT 340**

## Third Year

### Fall Semester
- **GE C**
- **CHEM 430** (Chem 120, Math 126, Phys 152L)
- **CHE 442**
- **CHE 450**
- **OPTIONAL ELECTIVE**

### Spring Semester
- **CHEM TECH. ELECTIVE**
- **CHE 444aL**
- **CHEM 205**
- **CHE 443**
- **SUSTAINABLE ENERGY ELECTIVE**

## Fourth Year

### Fall Semester
- **GE D**
- **CHEM 444bL**
- **CHEM 445**
- **CHE 485**
- **OPTIONAL ELECTIVE**

### Spring Semester
- **GE C**
- **CHEM 446**
- **CHEM 460L**
- **CHE 480**
- **GE B**

### Mathematics (16 Units)
- MATH 125: Calculus I
- MATH 126 or MATH 129: Calculus II
- MATH 226 or MATH 229: Calculus III
- MATH 245: Mathematics of Phys. and Engr.

### Physics (8 Units)
- PHYS 151L: Mechanics and Thermodynamics
- PHYS 152L: Electricity and Magnetism

### Chemistry (24 Units)
- CHEM 105aL: General Chemistry
- CHEM 105bL: General Chemistry
- CHEM 300L: Analytical Chemistry
- CHEM 322aL: Organic Chemistry
- CHEM 430L: Physical Chemistry: Thermodynamics & Kinetics

### General Education (32 Units)
- **GE A** The Arts (1 Course)
- **GE B** Humanistic Inquiry (2 Courses)
- **GE C** Social Analysis (2 Courses)
- **GE D** Life Sciences (1 Course)
- **GE E** Physical Sciences (1 Course)

### GE F: Quantitative Reasoning (1 Course)

### GE G,H: Global Perspectives (2 Courses)*

### General Education Seminar (1 Course)*

### Writing (7 Units)
- **WRIT 150**: Writing and Critical Reasoning
- **WRIT 340**: Advanced Writing

### Engineering (54 Units)
- CHE 120: Intro. to Chemical Engineering
- CHE 205: Numerical Methods in Chemical Engineering
- CHE 330: Chemical Engr. Thermodynamics
- CHE 350: Intro. to Separation Processes
- CHE 405: Applications of Prob. & Stats. for ChE or ISE 460: Engineering Economy or BUAD 301: Technical Entrepreneurship
- CHE 442: Chemical Reactor Analysis
- CHE 443: Viscous Flows
- CHE 444aBL: Chemical Engineering Lab
- CHE 445: Heat Transfer in CHE Processes
- CHE 450: Sustainable Energy
- CHE 460L: Chemical Process Dynamics & Control
- CHE 480: Chem. Process and Plant Design
- CHEM 105aL or MASC 110L, PHYS 152L or MASC 350L
- MATH 125 or 126 or 226
- PHYS 151L, (MATH 226)
- CHE 485: Comp.-Aided Chemical Process Design
- ENGR 102: Engineering Freshman Academy

### Special Notes
- Courses with this symbol may be satisfied with AP, IB or A-Level exams. See page 17 for more information.
- GE: Engineering students are encouraged to satisfy GE G and GE H with a course that also satisfies a Core Literacy. GE H may be satisfied by exam. Additionally, your GESM course should be taken in categories A, B, C, or D only. See pp. 16-17 for more information and consult your academic advisor for detailed assistance.
- OPTIONAL ELECTIVES: Consult with your academic advisor to explore optional elective courses. These courses are not required.
- SUSTAINABLE ENERGY ELECTIVE (3): Biofuel (CHEM 301 or CHEM 488 or CHE 489), Solar (CHE 487 or EE 519), Geothermal (PTE 463L)
- *Must have 49 engineering units to be able to take BUAD 301