



## CHEMICAL FOCUS AREA: Oil & Gas

Department of Chemical and Biochemical Engineering

| General Education (19 sh) |                        | sh |
|---------------------------|------------------------|----|
| ALL                       | RHET:1030 Rhetoric     | 4  |
| F/S                       | Diversity & Inclusion  | 3  |
| ALL                       | Be Creative            | 3  |
| ALL                       | Approved Gen Ed Course | 3  |
| ALL                       | Approved Gen Ed Course | 3  |
| ALL                       | Approved Gen Ed Course | 3  |

| Math & Basic Science Core (24 sh) |   | sh |
|-----------------------------------|---|----|
| F/S                               | MATH:1550 Math I: Single Variable Calculus (P: ALEKS score $\geq$ 75 or MPT Level 3 score $\geq$ 9) | 4  |
| ALL                               | MATH:1560 Math II: Multivariable Calculus (P: MATH:1550)  | 4  |
| ALL                               | MATH:2550 Math III: Matrix Algebra (P: MATH:1550)   | 2  |
| ALL                               | MATH:2560 Math IV: Differential Equations (P: MATH:1560 & MATH:2550)                                | 3  |

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|-----|--|---|----|
| ALL | CBE:3020 Appl Stat Chem & Natural Resource Engr  | 3 | OR |
| ALL | STAT:2020 Probability & Stats for Engr & Phys Sci (P: MATH:1560)                             | 3 | OR |
| ALL | STAT:3510 Biostatistics  | 3 |    |
| ALL | CHEM:1110 Principles of Chemistry I (P: ALEKS score $\geq$ 55 or MPT Level 3 score $\geq$ 9) | 4 |    |
| ALL | PHYS:1611 Introductory Physics I / Lab (C: MATH:1550)  | 4 |    |

| Engineering Core (7 sh) |   | sh |
|-------------------------|---|----|
| F                       | ENGR:1000 Engineering Success for First-Year Students (First semester standing) | 1  |
| F                       | ENGR:1100 Intro to Engineering Problem Solving                                  | 3  |
| F/S                     | ENGR:1300 Intro to Engineering Computing (C: MATH:1550)                         | 3  |

| ChemE Requirements (53 sh) |  | sh |    |
|----------------------------|--|----|----|
| ALL                        | CHEM:1120 Principles of Chemistry II (P: CHEM:1110 with a minimum grade of C-)   | 4  |    |
| ALL                        | CHEM:2210 Organic Chemistry I (P: CHEM:1120 with a minimum grade of C-)  | 3  | OR |
| F                          | CHEM:2230 Organic Chemistry I for Majors (P: CHEM:1120 with a minimum grade of C-)   | 3  |    |
| ALL                        | CHEM:2220 Organic Chemistry II (P: CHEM:2210 or CHEM:2230 with a minimum grade of C-)  | 3  |    |
| S                          | CHEM:2240 Organic Chemistry II for Majors (P: CHEM:2210 or CHEM:2230 with a minimum grade of C-)   | 3  | OR |
| ALL                        | CHEM:2410 Organic Chemistry Laboratory (P: CHEM:1120 & (CHEM:2210 or CHEM:2230), both with a minimum grade of C-; C: CHEM:2220 or CHEM:2240)     | 3  |    |
| S                          | CHEM:2420 Organic Chemistry Lab for Majors (P: CHEM:1120 & (CHEM:2210 or CHEM:2230), both with a minimum grade of C-; C: CHEM:2220 or CHEM:2240) | 3  | OR |

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|------|--|---|
| ALL  | ENGR:2130 Thermodynamics (P: CHEM:1110 & PHYS:1611; C: MATH:1560)  | 3 |
| ALL* | ENGR:2720 Materials Science (P: CHEM:1110; C: MATH:1550)   | 3 |
| F    | CBE:2110 Computational Tools for Chemical Engineers (P: MATH:1550; C: MATH:1560)                           | 2 |
| F/S  | CBE:2105 Process Calculations (P: MATH:1550)   | 3 |
| S    | CBE:3105 CHE Thermodynamics (P: ENGR:2130; C: CBE:2105)  | 3 |
| S    | CBE:3109 Fluid Flow (C: CBE:2105)  | 2 |
| F    | CBE:3113 Heat & Mass Transfer (P: MATH:2560 & CBE:2105; R: CBE:3109)                                       | 3 |
| F    | CBE:3117 Separations (P: CBE:2105 & CBE:3105; C: CBE:3113)   | 3 |
| F/S  | CBE:3120 Chemical Reaction Engineering (P: MATH:2560; C: CBE:3105; R: CBE:3113)                            | 3 |
| F    | CBE:3125 Chemical Process Safety (P: CBE:3105 & CBE:3109; C: CBE:3113)                                     | 3 |
| S    | CBE:3150 Thermodynamics / Transport Laboratory (P: CBE:3105 & CBE:3113)                                    | 3 |
| F    | CBE:3155 Chemical Reaction Engineering / Separation Lab (P: CBE:3117; C: CBE:3120; R: Statistics Elective) | 3 |
| S    | CBE:3205 Introduction Biochemical Engineering (P: CBE:2105; C: CME:3109; R: CBE:3120)                      | 3 |
| F    | CBE:4105 Process Dynamics & Control (P: MATH:2560, CBE:2105, & CBE:3109; C: CBE:3120)                      | 3 |

| ChemE Capstone Design Courses (5 sh) |  | sh |
|--------------------------------------|--|----|
| F                                    | CBE:4109 Chemical Engineering Process Design I (P: CBE:3109, CBE:3113, & CBE:3117; C: CBE:3120 & CBE:3125) | 2  |
| S                                    | CBE:4110 Chemical Engineering Process Design II (P: CBE:4109; R: CBE:4105 & CBE:3205)                      | 3  |

| ChemE Departmental Seminars (5 sh) |  | sh |
|------------------------------------|--|----|
| S                                  | CBE:1000 CBE Departmental Seminar                          | 1  |
| F/S                                | CBE:3000 CBE Professional Seminar (1 sh x4); (P: CBE:2105) | 4  |
| S                                  | CBE:4195 Senior Enriching Activities Seminar (C: CBE:4110) | 0  |

| Recommended: General Education (3 sh) |  | sh |
|---------------------------------------|--|----|
| F                                     | GEOG:1115 History & Science of Oil             | 3  |
| S                                     | GEOG:3780 U.S. Energy Policy in Global Context | 3  |

| Recommended: Advanced Chemistry/Science Electives (6 sh) |   | sh |
|--|---|----|
| F  | EES:3110 Chemical Evolution of the Oceans (see MyUI for offerings)  | 3  |
| F  | EES:4490 **Elements of Geochemistry (P: (EES:1030 or EES:1050) & (CHEM:1070 or CHEM:1110) (Fall semesters, even years))   | 3  |
| S  | EES:4630 **Hydrogeology (P: (MATH:1860 or MATH:1560) & (PHYS:1612 or PHYS:1512) & CHEM:1120) (Spring semesters; Fall semesters starting 2022) – highly recommended) | 3  |
| S  | EES:4640 Contaminant Hydrogeology (Recommended: EES:4630 or CEE:4102) – highly recommended)   | 3  |

Most paths on this EFA will require one of the following prerequisite courses. Due to their introductory nature, they do not qualify as EFA electives; can be taken as free elective.

|   |     |
|---|-----|
| CBE:1030 Intro to Earth Science - highly recommended to take with lab | 3-4 |
| EES:1050 Intro to Geology   | 4   |

| Required: (3 sh) |  | sh |
|------------------|--|----|
| S                | CBE:5405 Green Chemical And Energy Technologies (spring semester, odd years) (P: CBE:2105) | 3  |

| Engineering Electives: |   | sh |
|------------------------|---|----|
| F                      | CBE:5199 Contemporary Topics: Petroleum Refining  | 1  |
| F                      | CBE:5415 Satellite Image Processing & Remote Sensing of the Atmosphere (see MyUI for offerings) | 3  |
| S                      | CBE:5425 Atmospheric Chemistry & Physics (spring semesters, even years)                         | 3  |
| F/S                    | ENGR:2995 Intro to AI and Machine Learning in Engineering (P: ENGR:1300; C: MATH:2550)          | 3  |

| Science Electives: |  | sh |
|--------------------|--|----|
| F                  | EES:1290 Energy and the Environment (fall semester, even years)  | 3  |
| F                  | EES:2410 **Mineralogy (P: (CHEM:1110 or CHEM:1070) & (EES:1050 or EES:1030))   | 4  |
| SU                 | EES:2831 Geologic Field Methods (P: EES:1400 or EES:1080 or EES:1030 or EES:1050)  | 3  |
| S                  | EES:3100 Introduction to Applied Remote Sensing (P: EES:1030 or EES:1050 or EES:1080 or EES:1085)  | 4  |
| F                  | EES:3300 **Sedimentary Geology -highly recommended   | 4  |
| S                  | EES:3500 **Igneous and Metamorphic Petrology (P: (MATH:1010 or MATH:0300 or MATH:0100) & (EES:1050 or EES:1030) & (CHEM:1110 or CHEM:1070) & EES:2410) | 4  |
| S                  | EES:3770 Global Stratigraphy (spring semester, odd years)  | 3  |
| S                  | EES:3840 **Structural Geology (P: EES:1030 or EES:1050)  | 4  |
| F                  | EES:4300 Quantitative Methods in the Geosciences   | 3  |
| S                  | EES:4750 Mineral & Petroleum Exploration Geology (C: EES:3550 or EES:3840) (spring semester, odd years)  | 3  |
| F                  | EES:4790 Applied Environmental Geology (P: EES:1030 or EES:1080 or EES:1050)   | 3  |
| S                  | EES:4820 Tectonics and Basin Analysis (C: EES:3840) (spring semester, even years)  | 3  |
| SU                 | EES:4832 Geologic Field Analysis (P: EES:2831 & EES:3840)  | 3  |

Other Advances Science, Engineering, or Math courses - consult with academic advisor

Total Semester Hours Requirements: 134

Note: Pursuing this EFA may require taking more than 128 s.h.  
\*\*Consistent with a more traditional Petroleum Engineering track