

CHEMICAL ENGINEERING - PHARM TRACK (SIEP TRACK A) - CLASS OF 2020

Freshman Year Fall Semester

| Course Code | Description | Cr | |
|-------------|---|-----------|--|
| CHM 101 | General Chemistry Lec I (A1) | 3 | |
| CHM 102 | General Chemistry I Lab | 1 | |
| EGR 105 | Foundations of Engineering I (A4) | 1 | |
| MTH 141 | Intro Calculus w/ Analytical Geo (A1, B3) | 4 | |
| PHY 203 | Elementary Physics I (A1) | 3 | |
| PHY 273 | Elementary Physics Lab I (A1) | 1 | |
| SPA 205 | Spanish Language & Style I | 3 | |
| | | 16 | |

Freshman Year Spring Semester

| Course Code | Description | Cr | |
|-------------|---------------------------------------|-----------|--|
| BIO 101 | Principles of Biology I (A1) | 3 | |
| BIO 103 | Principles of Biology I Lab (A1) | 1 | |
| CHM 112 | General Chemistry II Lec | 3 | |
| CHM 114 | General Chemistry II Lab | 1 | |
| EGR 106 | Foundations of Engineering II (A4) | 2 | |
| MTH 142 | Intermed Calc with Analytic Geom (B3) | 4 | |
| SPA 206 | Spanish Language & Style II | 3 | |
| | | 17 | |

Sophomore Year Fall Semester

| Course Code | Description | Cr | |
|-------------|--|-----------|--|
| CHE 212 | Chemical Process Calculations | 3 | |
| CHM227 | Organic Chemistry Lec I | 3 | |
| CMB 211 | Intro Microbiology | 4 | |
| ECN 201 | Principles of Microeconomics (A2) | 3 | |
| MTH 243 | Calculus for Funcs. of Sev. Vars. (A1, B3) | 3 | |
| SPA 325 | Introduction to Literary Genres | 3 | |
| | | 19 | |

Sophomore Year Spring Semester

| Course Code | Description | Cr | |
|----------------------------------|--|-----------|--|
| CMB 311 <i>or</i> BIO 341 | Intro Biochemistry <i>or</i> Cell Biology | 3 | |
| CHE 232 | Materials Science and Engineering | 3 | |
| CHE 272 | Intro to Chemical Engineering Calculations | 3 | |
| CHE 313 | Chemical Engineering Thermodynamics I | 3 | |
| MTH 244 | Differential Equations | 3 | |
| SPA 3XX/4XX <i>or</i> POR XXX | | 3 | |
| | | 18 | |

Junior Year Fall Semester

| Course Code | Description | Cr | |
|----------------------------------|---|-----------|--|
| CMB 311 <i>or</i> BIO 341 | Intro Biochemistry <i>or</i> Cell Biology | 3 | |
| BPS 301 | Dosage Forms I | 2 | |
| BPS 303 | Dosage Forms II | 2 | |
| BPS 305 | Dosage Forms III | 2 | |
| CHE 314 | Chemical Engineering Thermodynamics II | 3 | |
| CHE 347 | Transfer Operations I | 3 | |
| SPA 3XX/4XX <i>or</i> POR XXX | | 3 | |
| | | 18 | |

Junior Year Spring Semester

| Course Code | Description | Cr | |
|-------------|--------------------------------------|-----------|--|
| BPS 425 | Current Good Manufacturing Processes | 3 | |
| CHE 348 | Transfer Operations II | 3 | |
| CHE 364 | Chemical Kinetics and Reactor Design | 3 | |
| PHY 204 | Elementary Physics II (A1) | 3 | |
| PHY 274 | Elementary Physics Lab II (A1) | 1 | |
| | General Education Outcome(s)* | 3 | |
| SPA 321 | Spanish for Business and Technology | 3 | |
| | | 19 | |

Semester Abroad

| Course Code | Description | Cr | |
|-------------|---|-----------|--|
| SPA/EGR 412 | Technical Spanish/Professional Elective | 3 | |
| | Engineering Course | 3 | |
| | General Education Outcome(s)* | 3 | |
| | General Education Outcome(s)* | 3 | |
| SPA 3XX/4XX | (4XX if not covered before) | 3 | |
| | | 15 | |

International Internship Semester

| Course Code | Description | Cr | |
|-------------|-----------------------|------------|--|
| SPA 316-317 | Language Study Abroad | 3-6 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | 3-6 | |

Senior Year Fall Semester

| Course Code | Description | Cr | |
|-------------|-------------------------------|-----------|--|
| CHE 345 | Chemical Engineering Lab I | 2 | |
| CHE 425 | Process Dynamics and Control | 3 | |
| CHE 428 | Professional Experience | 1 | |
| CHE 449 | Transfer Operations III | 3 | |
| CHE 451 | Plant Design and Economics I | 3 | |
| | General Education Outcome(s)* | 3 | |
| SPA 4XX | | 3 | |
| | | 18 | |

Senior Year Spring Semester

| Course Code | Description | Cr | |
|-------------|----------------------------------|--------------|--|
| CHE 346 | Chemical Engineering Lab II | 2 | |
| CHE 452 | Plant Design and Economics II | 3 | |
| | Approved Professional Elective** | 3 | |
| | Approved Track Elective*** | 3-4 | |
| | General Education Outcome(s)* | 3 | |
| SPA 4XX | | 3 | |
| | | 17-18 | |

Specified Math, Science, and Engineering Courses

| Introductory Engineering | | | | | |
|--------------------------|--------------|----|-------|----|------|
| Sem | Course | Cr | Grade | QP | Note |
| | EGR 105 (A4) | 1 | | | |
| | EGR 106 (A4) | 2 | | | |
| | | 3 | | | |

| Mathematics | | | | | |
|-------------|-------------------|----|-------|----|------|
| Sem | Course | Cr | Grade | QP | Note |
| | MTH 141 (A1 & B3) | 4 | | | |
| | MTH 142 (B3) | 4 | | | |
| | MTH 243 (A1 & B3) | 3 | | | |
| | MTH 244 | 3 | | | |
| | | 14 | | | |

| Natural Sciences | | | | | |
|------------------|--------------|----|-------|----|------|
| Sem | Course | Cr | Grade | QP | Note |
| | BIO 101 (A1) | 3 | | | |
| | BIO 103 (A1) | 1 | | | |
| | BIO 341 | 3 | | | |
| | CHM 101 (A1) | 3 | | | |
| | CHM 102 | 1 | | | |
| | CHM 112 | 3 | | | |
| | CHM 114 | 1 | | | |
| | CHM 227 | 3 | | | |
| | CMB 211 | 4 | | | |
| | CMB 311 | 3 | | | |
| | PHY 203 (A1) | 3 | | | |
| | PHY 273 (A1) | 1 | | | |
| | PHY 204 (A1) | 3 | | | |
| | PHY 274 (A1) | 1 | | | |
| | | 33 | | | |

| Engineering Science and Design (Major) | | | | | |
|--|--------------------------|----|-------|----|------|
| Sem | Course | Cr | Grade | QP | Note |
| | CHE 212 | 3 | | | |
| | CHE 232 (332) | 3 | | | |
| | CHE 272 | 3 | | | |
| | CHE 313 | 3 | | | |
| | CHE 314 | 3 | | | |
| | CHE 345 [capstone] | 2 | | | |
| | CHE 346 [capstone] | 2 | | | |
| | CHE 347 | 3 | | | |
| | CHE 348 | 3 | | | |
| | CHE 349 | 3 | | | |
| | CHE 364 (464) | 3 | | | |
| | CHE 425 | 3 | | | |
| | CHE 428 (328) | 1 | | | |
| | CHE 451 (351) [capstone] | 3 | | | |
| | CHE 452 (352) [capstone] | 3 | | | |
| | | 41 | | | |

| **Professional Elective | | | | | |
|-------------------------|--------|----|-------|----|------|
| Sem | Course | Cr | Grade | QP | Note |
| | | 3 | | | |
| | | 3 | | | |
| | | 6 | | | |

| ***Track Elective | | | | | |
|-------------------|--------|----|-------|----|------|
| Sem | Course | Cr | Grade | QP | Note |
| | | 3 | | | |

| Pharmacy | | | | | |
|----------|---------|----|-------|----|------|
| Sem | Course | Cr | Grade | QP | Note |
| | BPS 301 | 2 | | | |
| | BPS 303 | 2 | | | |
| | BPS 305 | 2 | | | |
| | BPS 425 | 3 | | | |

* **General Education Outcomes:** at least 40 credits must be completed. (A1-D1) must be met by at least three credits. A single course may satisfy one or two outcomes, and at least one course must be a "Grand Challenge". No more than twelve credits can be from the same course code except HPR. General education courses may also be used to meet requirements of your major(s) or minor(s) when appropriate.

****Professional Elective:** Half of the Professional Electives are to be 400- level or higher CHE courses taken at URI. In addition EGR 325 and EGR 326 are permissible approved professional electives. The remaining courses are to be 300-level or higher 400-level or higher in engineering (BME, CHE, CPE, CVE, ELE, ISE, MCE, OCE), or 400-level or higher in MTH

*****Track Elective:** CHE 466, 548, 550, 574; BPS 503, 542; PHY 430, 545 . *All professional and track electives require prior approval by CHE advisor.*

| Spanish Language Requirements (min. 30 credits) | | | | |
|--|----------|----|----|----|
| Sem | Course | Cr | Gr | QP |
| | SPA ___ | 3 | | |
| | SPA ___ | 3 | | |
| | SPA 316 | 3 | | |
| | SPA 317 | 3 | | |
| | SPA 321 | 3 | | |
| | SPA 325 | 3 | | |
| | SPA 412 | 3 | | |
| | SPA 4___ | 3 | | |
| | SPA 4___ | 3 | | |
| | SPA 4___ | 3 | | |
| <p>SPA 101, 102, 391, 392, and 393 cannot be counted towards the Spanish major and SPA 321 may only count toward the major for students in the IEP or IBP.</p> <p>SPA 412 and 421 will not fulfill any of the 9 credits required that are above the 400-level, but may count toward any of the remaining credits required for the major.</p> <p>LIN 202 and 220 may be used towards major requirements</p> <p>The IEP requires SPA 316, 317, 321, 325, 412 and (3) 400-level Spanish Literature courses. IEP students that are beginning Spanish at the 200-level may use up to 6 credits of Portuguese toward the major, as long as all other requirements are met.</p> <p>Students may opt to take summer or Jterm classes to advance in their Spanish skills at a faster pace</p> | | | | |

| General Education Outcome Audit | | |
|---|-------------------------|--------|
| | Course | Credit |
| Knowledge | | |
| A1. STEM | CHM & PHY (see above) | 11 |
| A2. Social & Behavioral Sciences | ECN 201 | 3 |
| A3. Humanities | SPA 205/206 (suggested) | 3 |
| A4. Arts & Design | EGR 105 & 106 | 3 |
| Competences | | |
| B1. Write Effectively | | |
| B2. Communicate Effectively | | |
| B3. Mathematical, statistical, or computational strategies | MTH (see above) | 11 |
| B4. Information literacy | | |
| Responsibilities | | |
| C1. Civic knowledge & responsibilities | | |
| C2. Global responsibilities | SPA 205/206 (suggested) | 3 |
| C3. Diversity and Inclusion | | |
| Inegrate & Apply | | |
| D1. Ability to synthesize | CHE 452 | 3 |
| Grand Challenge | | |
| G. Check that at least one course of your 40 credits is an approved | | |
| Total General Education Outcome Credits | | 40 |