

# CHEMICAL ENGINEERING - BIOLOGY TRACK (FLAGSHIP TRACK A) - CLASS OF 2021

\*\*\*Flagship students see <http://web.uri.edu/chineseflagship/academics/> for curriculum requirements\*\*\*

## 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 with Analytical Geometry (A1, B3) | 4         |
| PHY 203     | Elementary Physics I (A1)                        | 3         |
| PHY 273     | Elementary Physics Lab I (A1)                    | 1         |
| CHN 111     | Intensive Beginning Chinese I                    | 4         |
|             |  | <b>17</b> |

## Summer Semester

|         |                                   |          |
|---------|-----------------------------------|----------|
| CHN 113 | Intensive Intermediate Chinese I  | 4        |
| CHN 114 | Intensive Intermediate Chinese II | 4        |
|         |                                   | <b>8</b> |

## Sophomore Year Fall Semester

| Course Code | Description                                | Cr        |
|-------------|--|-----------|
| CHE 212     | Chemical Process Calculations              | 3         |
| CHM227      | Organic Chemistry Lec I                    | 3         |
| ECN 201     | Principles of Microeconomics (A2)          | 3         |
| MTH 243     | Calculus for Funcs. of Sev. Vars. (A1, B3) | 3         |
|             | General Education Outcome(s)*              | 3         |
| CHN 215     | Intensive Conversation and Comp. I         | 4         |
|             |  | <b>19</b> |

## Junior Year Fall Semester

| Course Code                      | Description                               | Cr        |
|----------------------------------|---|-----------|
| <del>CMB 311 or</del><br>BIO 241 | Intro Biochemistry <i>or</i> Cell Biology | 3         |
| CHE 314                          | Chemical Engineering Thermodynamics II    | 3         |
| CHE 347                          | Transfer Operations I                     | 3         |
| PHY 204                          | Elementary Physics II (A1)                | 3         |
| PHY 274                          | Elementary Physics Lab II (A1)            | 1         |
| CHN 315                          | Intensive Adv.CHN for the Chinese Flag. I | 4         |
|                                  |   | <b>17</b> |

## Semester Abroad

| Course Code | Description                       | Cr        |
|-------------|-----------------------------------|-----------|
| CHN 4XX     |                                   | 8         |
|             | Approved Professional Elective*** | 3         |
|             | General Education Outcome(s)*     | 3         |
|             | General Education Outcome(s)*     | 3         |
|             |                                   | <b>17</b> |

## 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         |
| EGR 413     | Advanced Technical Chinese   | 4         |
|             |                              | <b>19</b> |

## 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         |
| CHN 112     | Intensive Elementary Chinese II       | 4         |
|             |                                       | <b>18</b> |

## Sophomore Year Spring Semester

| Course Code                      | Description                                | Cr        |
|----------------------------------|--|-----------|
| <del>CMB 311 or</del><br>BIO 241 | 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         |
| CHN 215                          | Intensive Conversation and Comp. II        | 4         |
|                                  |  | <b>19</b> |

## Junior Year Spring Semester

| Course Code | Description                                | Cr        |
|-------------|--|-----------|
| CHE 348     | Transfer Operations II                     | 3         |
| CHE 364     | Chemical Kinetics and Reactor Design       | 3         |
| CMB 211     | Intro to Microbiology                      | 4         |
|             | Approved Track Elective**                  | 3         |
| CHN 316     | Intensive Adv.CHN for the Chinese Flag. II | 4         |
|             |  | <b>17</b> |

## International Internship Semester

| Course Code | Description           | Cr         |
|-------------|-----------------------|------------|
| CHN 497/498 | Language Study Abroad | 3-6        |
|             |                       | <b>3-6</b> |

## Senior Year Spring Semester

| Course Code                  | Description                            | Cr           |
|------------------------------|--|--------------|
| CHE 346                      | Chemical Engineering Lab II            | 2            |
| CHE 452                      | Plant Design and Economics II (D1, C2) | 3            |
|                              | Approved Mathematics Elective****      | 3            |
|                              | Approved Professional Elective***      | 3            |
|                              | Approved Track Elective**              | 3-4          |
| <del>CHN 4XX or</del><br>EGR | professional elective**                | 3-4          |
|                              |  | <b>17-19</b> |

**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 364 (464)                      | 3  |       |    |      |
|  | CHE 425                            | 3  |       |    |      |
|  | CHE 428 (328)                      | 1  |       |    |      |
|  | CHE 449 (349)                      | 3  |       |    |      |
|  | CHE 451 (351) [capstone]           | 3  |       |    |      |
|  | CHE 452 (352) [capstone] (D1 & C2) | 3  |       |    |      |
|  |                                    | 41 |       |    |      |

| **Track Elective |        |     |       |    |      |
|------------------|--------|-----|-------|----|------|
| Sem              | Course | Cr  | Grade | QP | Note |
|                  |        | 3   |       |    |      |
|                  |        | 3-4 |       |    |      |

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

| ****Mathematics Elective |        |    |       |    |      |
|--------------------------|--------|----|-------|----|------|
| Sem                      | Course | Cr | Grade | QP | Note |
|                          |        | 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.  
**\*\*Track Elective:** CHE 466, 548, 550, 574; BPS 503, 542; PHY 545    **\*\*\*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. *All professional and track electives require prior approval by CHE advisor.*  
**\*\*\*\*Mathematics Elective:** MTH 215 or any 300-, 400-, or 500-level MTH course *except* MTH 381

| Chinese Language Requirements  |            |        |    |    |      |
|--|------------|--------|----|----|------|
| Sem  | Course     | Cr     | Gr | QP | Note |
| <b>Six (6) credits in Chinese Literature and Civilization. At least 3 of these credits must be at the 400-level. Students in the Chinese Language Flagship Program may take CHN 315 and 316 or CHN 315H and 316H in lieu of the 6 credits at the 400-level and 6 credits in literature and civilization requirement.</b> |            |        |    |    |      |
|  | CHN _____  | 3      |    |    |      |
|  | CHN 4_____ | 3      |    |    |      |
| <b>18 Credits of CHN electives to reach 30 major credits</b>   |            |        |    |    |      |
|  | CHN _____  | 3      |    |    |      |
|  | CHN _____  | 3      |    |    |      |
|  | CHN _____  | 3      |    |    |      |
|  | CHN _____  | 3      |    |    |      |
|  | CHN _____  | 3      |    |    |      |
|  | CHN _____  | 3      |    |    |      |
| <b>Choose six (6) credits in Chinese/Asian History, Politics, Philosophy, or Arts from: HIS 171, 374; PHL 331; PSC 116*, 377; RLS 131; THE 382</b>   |            |        |    |    |      |
|  |            | 3 or 4 |    |    |      |
|  |            | 3 or 4 |    |    |      |
| <b>CHN 101, 102, and 111 will not count toward major requirements. At least 6 CHN credits must be at the 400-level.</b>  |            |        |    |    |      |
| <b>* PSC 116 approved for general education credit</b>   |            |        |    |    |      |

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