

**Course Sequence**  
**Chemical Engineering, Environmental engineering option**

**1<sup>st</sup> YEAR (30 credits)**

|         |                                   | <b><u>Session</u></b> | <b><u>Prerequisite</u></b>  |
|---------|-----------------------------------|-----------------------|---|
| CHM1311 | Principles of Chemistry           | Fall                  | 4U chemistry or OAC Chemistry or equivalent.                              |
| ENG1112 | Technical Report Writing          | Fall                  |   |
| GNG1105 | Engineering Mechanics             | Fall                  | Physics 4U, advanced functions and Introductory Calculus 4U or equivalent |
| GNG1106 | Fundamentals of Engineering       | Fall                  |   |
|         | Computation                       |                       |   |
| MAT1320 | Calculus I                        | Fall                  | One of MAT1339, Ontario 4U Calculus and Vectors (MCV4U) or an equivalent. |
| CHG1125 | Chemical Engineering Fundamentals | Winter                | CHM1301 or CHM1311  |
| CHM1321 | Organic Chemistry I               | Winter                | CHM1301 or CHM1311 or 4U chemistry or OAC Chemistry or equivalent.        |
| MAT1322 | Calculus II                       | Winter                | MAT1320   |
| MAT1341 | Introduction to Linear Algebra    | Winter                | MAT1339 or Ontario 4U Calculus and Vectors (MCV4U), or an equivalent.     |
| PHY1122 | Fundamentals of Physics II        | Winter                | OAC or 4U Physics; corequisite: MAT1320 (preferred) or MAT1330.           |

**2<sup>nd</sup> YEAR (36 credits)**

|         |                                     | <b><u>Session</u></b> | <b><u>Prerequisite</u></b>   |
|---------|-------------------------------------|-----------------------|--|
| CHG2312 | Fluid Flow                          | Fall                  | CHG1125  |
| CHG2317 | Introduction to Chemical Process    | Fall                  | CHG1125  |
|         | Analysis and Design                 |                       |  |
| CHM2120 | Organic Chemistry II                | Fall                  | CHM1321  |
| CVG2132 | Fundamentals of Environmental       | Fall                  | CHM1311  |
|         | Engineering                         |                       |  |
| MAT2322 | Calculus III for Engineers          | Fall                  | (MAT1322 or MAT1325 or MAT1332), (MAT1341 or CEGEP linear algebra)                     |
| MAT2384 | Ordinary Differential Equations     | Fall                  | MAT1341, (MAT1322 or MAT1325 or MAT1322)   |
|         | and Numerical Methods               |                       |  |
| CHG2314 | Heat Transfer Operations            | Winter                | CHG2312, CHG2317, MAT2384, ENG1112   |
| CHM2330 | Physical Chemistry: Introduction to | Winter                | (CHM1301 or CHM1311), (MAT1322 or MAT1332), (PHY1121 or PHY1321 or PHY1122 or PHY1331) |
|         | the Molecular Properties of Matter  |                       |  |
| ECO1192 | Engineering Economics               | Winter                |  |
| HIS2129 | Technology, Society and             | Winter (HIS2129)      |  |
| or      | Environment since 1800 /            | Fall (PHI2394)        |  |
| PHI2394 | Scientific Thought and Social       |                       |  |
|         | Value                               |                       |  |
| MAT2377 | Probability and Statistics for      | Winter                | MAT1320 or MAT1330; corequisite: MAT1322 or MAT1325 or MAT1332                         |
|         | Engineers                           |                       |  |
| PHI2398 | Environmental Ethics                | Winter**              |  |

\*\* Note that this course is not always offered every year, and a course sequence modification might be required.

### **3<sup>rd</sup> YEAR (33 credits)**

|                        |  | <b><u>Session</u></b> | <b><u>Prerequisite</u></b>   |
|------------------------|--|-----------------------|--|
| CHG3316                | Transport phenomena  | Fall                  | Prerequisites for CHG: CHG2312, CHG2314, CHG2317, MAT2322, MAT2384. Prerequisites for CVG: CHG2317, CVG3132, MAT2322, MAT2384) CHG2317 |
| CHG3324                | Fundamentals and Applications of Chemical Engineering Thermodynamics | Fall                  |  |
| CHG3331                | Application of Mathematical Methods to Chemical Engineering          | Fall                  | CHG2312, CHG2314, CHG2317, MAT2322, MAT2384, GNG1106   |
| CHG3335                | Process control  | Fall                  | CHG2312, CHG2314, CHG2317, MAT2384. Prerequisite or corequisite: CHG3331   |
| CHG3337                | Data Collection and Interpretation                                   | Fall                  | MAT2377  |
| Complementary elective |  | <b>Fall/Winter</b>    |  |
| CHG3111                | Unit operations  | Winter                | CHG3316  |
| CHG3112                | Process Synthesis, Design and Economics                              | Winter                | CHG3316, CHG3324, ECO1192. Prerequisite or corequisite: CHG3111  |
| CHG3122                | Chemical engineering practice  | Winter                | CHG2312, CHG2314, CHG3324  |
| CHG3127                | Chemical reaction engineering  | Winter                | CHG3316, CHG3331   |
| CHG3326                | Principles of Phase Equilibria and Chemical Reaction Equilibria      | Winter                | CHG3316, CHG3324   |

### **4<sup>th</sup> YEAR (33 credits)**

|   |   | <b><u>Session</u></b> | <b><u>Prerequisite</u></b>   |
|---|---|-----------------------|--|
| CHG4116   | Chemical Engineering Laboratory               | Fall                  | CHG3122, CHG3111, CHG3127, CHG3326, CHG3335. Prerequisite or corequisite: CHG3337  |
| CHG4305   | Advanced Materials in Chemical Engineering    | Fall                  | 81 university credits  |
| CHG4343   | Computer-Aided Design in Chemical Engineering | Fall                  | 81 university credits including CHG3111, CHG3127, CHG3331, CHG3335   |
| CHG4381   | Biochemical Engineering                       | Fall                  | 81 university credits including CHG3111, CHG3127   |
| CHG4900 or Two Technical electives <sup>3</sup> |   | <b>Fall/Winter</b>    |  |
| CHG4244   | Plant design Project                          | Winter                | 81 university credits including CHG3111, CHG3112, CHG3122, CHG3127, CHG3316, CHG3324, CHG3326, CHG3331, CHG3335, CHG3337 |
| CHG4307   | Clean Processes and Sustainable Development   | Winter                | 81 university credits  |
| GNG4170   | Engineering Law                               | Winter                |  |
| Technical elective                              |   | <b>Fall/Winter</b>    |  |