# Chemical Engineering 420000BS

The following information has official approval of the **College of Engineering**, but is intended only as a supplemental guide. Official degree requirements are established at the time of transfer and admission to the degree-granting college. *Completion of this degree within the identified time frame below is contingent upon many factors, including but not limited to: class availability, total number of required credits, work schedule, finances, family, course drops/withdrawals, successfully passing courses, prerequisites, among others.* The transfer process is completed through an appointment with your academic advisor.

*Italicized* courses fulfill General Education requirements. Unless a course is specified, refer to the General Education guide at http://www.uakron.edu/advising/docs/General_Education_Guide.pdf.

| **1st Year** | **Fall Semester** | Credit Hours | Prerequisites |
|---|---|---|---|
| 3150:151 | *Principles of Chemistry I Lecture and Recitation (Natural Science Requirement)* | 3 | Placement into 3450:149 or higher or permission |
| 3150:152 | *Principles of Chemistry I Lab (Natural Science Requirement)* | 1 | 3150:151, corequisite |
| 3450:221 | *Analytic Geometry-Calculus I* | 4 | Placement Test or 3450:149 with C- or better |
| 4200:101 | Tools for Chemical Engineering | 2 | 3450:149 (Precalculus) or higher and 4200:110, corequisites |
| 4200:110 | Project Management and Teamwork I | 1 | 4200:101, corequisite |
| | *English Composition I Requirement* | 3 | Appropriate placement by advisor |
| | *Physical Education/Wellness* | 1 | |
| **Total** | | **15** | |

| **1st Year** | **Spring Semester** | | |
|---|---|---|---|
| 3150:153 | Principles of Chemistry II Lect and Recitation | 3 | 3150:151 |
| 3150:154 | Qualitative Analysis Lab | 2 | 3150:152, prerequisites and 3150:153, co-requisite |
| 3450:222 | Analytic Geometry-Calculus II | 4 | 3450:221 with C- or better |
| 4200:121 | Chemical Engineering Computations | 2 | 4200:101 |
| | *English Composition II Requirement* | 3 | 3300:111 or equivalent |
| | *Speech/Oral Communication Requirement* | 3 | |
| **Total** | | **17** | |

| **2nd Year** | **Fall Semester** | | |
|---|---|---|---|
| 4200:200 | Material and Energy Balances* | 4 | 3450:221, 3150:151, 4200:121 |
| 4200:210 | Project Management and Teamwork II | 1 | 4200:110 |
| 3150:263 | Organic Chemistry Lecture I | 3 | 3150:153 |
| 3150:265 | Organic Chemistry Lab | 2 | 3150:154 prerequisite; 3150:263, corequisite |
| 3150:265 | Organic Chemistry Discussion | 0 | 3150:263, corequisite |
| 3450:223 | Analytic Geometry-Calculus III | 4 | 3450:222 with C- or better |
| 3650:291 | *Elementary Classical Physics I Lecture and Lab (Natural Science Requirement)* | 4 | 3450:221 |
| **Total** | | **18** | |

*A student must have a grade of C- or better in this course to complete the program.

| **2nd Year** | **Spring Semester** | | |
|---|---|---|---|
| 4200:225 | Equilibrium Thermodynamics | 4 | 4200:200, 3450:223 |
| 3150:264 | Organic Chemistry Lecture II | 3 | 3150:263 |
| 3450:335 | Introduction to Ordinary Differential Equations | 3 | 3450:223 with C- or better |
| 3650:292 | Elementary Classical Physics II Lecture & Lab | 4 | 3650:291 |
| 4300:201 | Statics | 3 | 3450:222, 3650:291, corequisites |
| **Total** | | **17** | |

| 3rd Year | Fall Semester | | |
|---|---|---|---|
| 3150:313 | Physical Chemistry Lecture I | 3 | 3150:264, 3450:223, 3650:291 |
| | Advanced Math Elective | 2 | |
| 3250:244 | *Introduction to Economic Analysis (Social Science Requirement)* | 3 | |
| 4200:353 | Mass Transfer Operations | 3 | 4200:225 and C- or better in 4200:200 |
| 4200:321 | Transport Phenomena (Lecture and Recitation) | 3 | 4200:200 and 3450:335 |
| 4200:341 | Process Economics | 2 | 4200:200 |
| 4200:310 | Project Management and Teamwork III | 1 | 4200:210 prerequisite and 4200:353 co-requisite |
| **Total** | | **17** | |

| 3rd Year | Spring Semester | | |
|---|---|---|---|
| 3150:314 | Physical Chemistry II | 3 | 3150:264, 3450:335, 3650:292 |
| 4200:330 | Chemical Reaction Engineering | 3 | 4200:225 and 3450:335 |
| 4200:351 | Fluid and Thermal Operations Lecture | 3 | 4200:321 |
| 4200:305 | Materials Science | 2 | 3150:153 and 3650:292 |
| 4200:360 | Chemical Engineering Lab and Lecture | 3 | 4200:353, prerequisite<br>4200:330 and 4200:351, corequisites |
| | *Humanities Elective Requirement* | 3 | |
| **Total** | | **17** | |

| 4th Year | Fall Semester | | |
|---|---|---|---|
| 3400:210<br>**or**<br>3400:221 | *Humanities in the Western Tradition –OR-*<br>***-OR-***<br>*Humanities in the World Since 1300* | 4 | 32 credit hours and 3300:112 equivalent<br><br>32 credit hours and 3300:112 equivalent |
| | Advanced Chemistry Elective | 3 | |
| 4200:435 | Process Analysis and Control | 3 | 4200:330 and 4200:353 |
| 4200:441 | Process Design I | 3 | 4200:330, 4200:351, 4200: 353 and 4200:341 |
| 4200:410 | Project Management and Teamwork IV | 1 | 4200:310 prerequisite and 4200:441 co-requisite |
| | *Social Science Requirement* (not economics) | 3 | |
| **Total** | | **17** | |

| 4th Year | Spring Semester | | |
|---|---|---|---|
| | *Area Studies / Cultural Diversity Requirement* | 2-3 | |
| | *Humanities Elective Requirement* | 3 | |
| 4200:xxx | Chemical Engineering Elective | 3 | |
| 4200:xxx | Design Elective | 3 | |
| 4400:307 | Basic Electrical Engineering | 4 | 3650:292, prerequisite and<br>3450:335, corequisite |
| 4200:442 | Process Design II | 3 | 4200:441 |
| **Total** | | **18-19** | |

| | | | |
|---|---|---|---|
| | **Minimum Total Credits for Degree** | **137** | |

**ALERT: 1) By the end of your first 48 credit hours attempted, you should have completed your General Education English, Math, and Oral Communication (Speech) requirements; 2) By the end of your first 48 credit hours attempted, you should have declared a major and transferred to (been accepted by) a degree granting college at The University of Akron.**

**Chair of Chemical Engineering Department: Dr. H. Michael Cheung, Whitby Hall 211, (330) 972-7282**
**E-Mail: cheung@uakron.edu & Web Address: www.chemical.uakron.edu**

**SCHEDULING:** No 4200 course in Chemical Engineering is available more than one term per year. Students should plan accordingly to minimize out-of-phase problems.

**IN GENERAL:** The purpose of the Chemical Engineering curriculum is to prepare men and women for professional careers in the practical application of chemistry, mathematics, and physics to develop e safe and cost effective ways of using materials and energy for the benefit of the human race.

**SALARY LEVEL:** Starting salary offers for new graduates range from $38,000 to $96,000 per year. The average is $65,200.

**JOB DESCRIPTION:** Chemical Engineers enjoy every kind of employment. Most are concerned with complex industrial systems and are in demand by all segments of our society. Pharmaceuticals, polymers, petrochemicals, paints, paper, nuclear power, packaging, soap, textiles, tires, and beer are just a few of the materials which Chemical Engineers create, improve, produce, and sell.

**JOB LOCALE:** Chemical Engineers find acceptance in virtually every industrial classification because of their knowledge of materials and ability to deal with highly complex process systems. Opportunities are found in large and small companies, governmental agencies, and in one's own business.

**TRANSFER TO COLLEGE OF ENGINEERING:** To be admitted to the college, the student must:

- Complete at least 30 semester hours of coursework post high school
- Complete Calculus 2 with a C- or higher
- Have a 2.3 grade point average in at least three of the following categories:
    - in all coursework
    - in all engineering coursework
    - in all required mathematics coursework
    - in all required science coursework (chemistry, physics, computer science, biology)

Admission of students who do not meet the above requirements will be considered by the dean or representative only if the request originates by an Engineering department head or representative.

Students can arrange inter-college transfers through an appointment with their academic advisor; advisor contact information is listed in "My Akron."

**CO-OP OPTION:** Students can choose between a five-year program, which includes up to four semesters of co-op experience, or a four-year program without co-op experience. The Co-op Program provides an opportunity to gain real-world, relevant experience while working toward a bachelor's degree. Students who participate in the Co-op Program earn money to help fund their education, graduate with 12 or more months of career-related experience, and often receive a higher starting salary after graduation. More information about the Co-op Program can be found at engineering.uakron.edu/coop

**PLACEMENT:** The Engineering Co-op and Placement Office, ASEC 203, Akron, Ohio 44325 assists all graduates with full-time placement.

**WOMEN AND MINORITY ENGINEERS:** Eligible students are invited to register into the applicable engineering course elective. There are two options; 4100:110, Women in Engineering Seminar & Peer Group (Contact: Heidi Cressman, 330-972-7701, or hec9@uakron.edu). This course provides beginning women students an overview of the career opportunities for women in engineering. The course introduces relevant topics in engineering, an overview of career opportunities, student led discussion groups and an opportunity to meet with professionals in various engineering disciplines. The other option is 4100:120, Minority Engineering Seminar and Peer Groups (Contact: Julie Zhao, 330-972-2823, or zhao1@uakron.edu). This course provides an overview of disciplines and opportunities in engineering. It also reinforces educational/ career choices and provides role models of successful minority engineers.

(Jackson)