# Engineering (Bachelor of Science Engineering) Course Plan
# Chemical/Pharmaceutical Concentration
## TIER I – Math ACT of 21 or below/Math RSAT of 530 or below

| Freshman Fall Semester | | | Freshman Spring Semester | | |
|---|---|---|---|---|---|
| MATH 110 | Fundamentals of Math | 3 | MATH 111 | College Algebra | 3 |
| **ENGR 100** | **Freshman Seminar*** | **1** | CHEM 100 | Preparatory Chemistry* | 3 |
| BIOL 111 | Basic Biology | 4 | HUM/FA | Elective | 3 |
| ENGL 101 | Academic Writing | 3 | ENGL 102 | Academic Writing & Literature | 3 |
| HIST 111/112 | Western Civilization 1 or 2 | 3 | **ENGR 110** | **Introductory Engineering Applications*** | **3** |
| | | | CUC 100 | Connections | 0.5 |
| | **Semester Total:** | **14.0** | | **Semester Total:** | **15.5** |

| Summer Semester after Freshman Year | | | | | |
|---|---|---|---|---|---|
| MATH 115 | Precalculus | 3 | CHEM 113 | General Chemistry II | 4 |
| CHEM 111 | General Chemistry I | 4 | | | |
| | | | | **Semester Total:** | **11.0** |

| Sophomore Fall Semester | | | Sophomore Spring Semester | | |
|---|---|---|---|---|---|
| MATH 122 | Calculus I | 4 | MATH 223 | Calculus II | 4 |
| **ENGR 120** | **Foundations of Engineering Design I*** | **3** | **ENGR 121** | **Foundations of Engineering Design II*** | **3** |
| ENGL 2xx | English Literature | 3 | **ENGR 240** | **Engineering Materials & Processes*** | **4** |
| CUC 200 | Connections | 0.5 | **ENGR 300** | **Engineering Economics** | **3** |
| CHEM 227 | Organic Chemistry I | 4 | CHRS 125 | Introduction to Christianity | 3 |
| ECON 201 | Microeconomics | 3 | | | |
| | **Semester Total:** | **17.5** | | **Semester Total:** | **17.0** |

| Summer Semester after Sophomore Year | | | | | |
|---|---|---|---|---|---|
| MATH 224 | Calculus III | 4 | CHEM 228 | Organic Chemistry II | 4 |
| PHYS 251 | Physics I | 4 | **CHPH 215** | **Mass and Energy Balances** | **3** |
| | | | | **Semester Total:** | **15.0** |

| Junior Fall Semester | | | Junior Spring Semester | | |
|---|---|---|---|---|---|
| MATH 310 | Differential Eq and Linear Algebra | 4 | **ENGR 320** | **Fluids*** | **3** |
| BIOL 280 | Essentials of Microbiology and Biochemistry* | 4 | **ENGR 220** | **Statics & Strength of Materials** | **3** |
| **ENGR 310** | **Thermodynamics*** | **3** | **CHPH 325** | **Heat Transport*** | **2** |
| **ENGR 260** | **Electrical Circuits*** | **4** | **CHPH 345** | **Bioprocess Engineering*** | **2** |
| **CHPH 315** | **Mass Transport** | **3** | **CHPH 350** | **Reaction Engineering*** | **3** |
| | **Semester Total:** | **18.0** | | **Semester Total:** | **13.0** |

| Senior Fall Semester | | | Senior Spring Semester | | |
|---|---|---|---|---|---|
| **CHPH 440** | **Process Control** | **3** | **ENGR 492** | **Senior Design II** | **2** |
| **ENGR 491** | **Senior Design I** | **4** | **ENGR 460** | **Statistical Meth for Engineers** | **3** |
| **CHPH 445** | **Unit Operations*** | **4** | HUM/FA or SOC/BEH SCI | Elective | 3 |
| ENGL 305 | Technical Writing and Presentations | 3 | ART/MUSIC/ THEA 131 | Fine Arts | 3 |
| | | | PE 185 | Lifetime Wellness | 2 |
| | **Semester Total:** | **14.0** | | **Semester Total:** | **13.0** |
| | | | | **Degree Total** | **136** |

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Total Math and Science Hours: 47 (includes Statistics for Engineers but not Pre-calculus, College Algebra, or Introductory Mathematics)
Total Engineering Hours: 53 (includes Engineering Economics but not Introductory Engineering Applications)

ABET Requirements
Math and Science: minimum of 30 hours
Engineering: minimum of 45 hours

LEGEND:

RED FONT - this course does not count toward the BS ENGR degree; this course is required for students who enter the program without the required pre-requisite knowledge

BOLD-FACED FONT – designates a course taught by the School of Engineering

BLUE BOX – indicates a course taken by all Tier 1 engineering students

* - indicates class-lab