|  |  |  |  |
| --- | --- | --- | --- |
| **Chemical Engineering**  *Focus Area*  **Pharmaceuticals** | | | |
| **General Education Components[[1]](#endnote-1) (15 semester hours)** | | | |
| GEC | Courses consistent with career goals | 15 s.h. | |
| **Statistics Elective (3 semester hours)**  *(Choose one)* | | | |
| STAT:2020 | Probability and Statistics for Engineering and Physical Sciences | 3 s.h. | |
| STAT:3510  CBE:3020 | Biostatistics  Applied Statistics for Chemical and Natural Resources Engineering (offered Spring semesters) | 3 s.h.  3 s.h. | |
| **Advanced Chemistry/Science Electives2 (6 semester hours)** | | | |
|  | Advanced Chemistry Course *(Recommended: Biochemistry)* | 3 s.h. | |
|  | Advanced Science Course | 3 s.h. | |
| **Free Electives (12 semester hours from the following list)** | | | |
| **Required Courses (choose 1)** | | |  |
| *(Choose one)* |  | |  |
| PCOL:2220 | Drug Use and Abuse | | 3 s.h. |
| PCOL:3101 | Pharmacology I: Drug’s Fantastic Journey | |  |
|  |  | |  |
| *(Choose 6 s.h.)* |  | |  |
|  | Electives from the engineering or pharmaceutics lists | | 6 s.h. |
| **Engineering Electives** |  | |  |
| ENGR:2995 | Intro to AI and Machine Learning in Engineering | | 3 s.h. |
| CBE:3998 | Individual Investigations | | 1-3 s.h. |
| CBE:5210 | Bioseparations *(offered spring of even years)* | | 3 s.h. |
| CBE:5300 | Drug Delivery Devices *(offered spring of odd years)* | | 3 s.h. |
| CBE:5740 | Engineering Principles of Drug Delivery | | 3 s.h. |
| BME:5421 | Cell Material Interactions3 | | 3 s.h. |
| BME:5430 | Biotransport *(offered fall of odd years)* | | 3 s.h. |
| **Science Electives** |  | |  |
| BIOC:3110 | Biochemistry | | 3 s.h. |
| BIOC:3120 | Biochemistry and Molecular Biology I | | 3 s.h. |
| BIOC:3130 | Biochemistry and Molecular Biology II | | 3 s.h. |
| BIOC:3140 | Experimental Biochemistry | | 2 s.h. |
| BIOL:1411 | Foundations of Biology | | 4 s.h. |
| BME:4310 | Computational Biochemistry *(offered fall of even years)* | | 3 s.h. |
| CHEM:3110 | Analytical Chemistry I | | 3 s.h. |
| CHEM:3120 | Analytical Chemistry II | | 3 s.h. |
| CHEM:3430 | Analytical Measurements | | 3 s.h. |
| HHP:1300 | Fundamentals of Human Physiology | | 3 s.h. |
| OEH:6450 | Aerosol Technology | | 3 s.h. |
| CHEM:xxxx | Upper-level chemistry course (3000 and above) | | 3 s.h. |
| **Pharmaceutics Electives** | | |  |
| PCOL:2220 | Drug Use and Abuse | | 3 s.h. |
| PCOL:3101 | Pharmacology I: A Drug’s Fantastic Journey (*offered fall, requires BIOL:1411*) | | 3 s.h. |
| PCOL:3102 | Pharmacology II: Mechanisms of Drug Action (*offered spring, requires PCOL:3101*) | | 3 s.h. |
| PHAR:4146 | Drug Disposition and Pharmacokinetics (*offered spring, requires BIOL:1411 and Statistics*) | | 2 s.h. |
| PHAR:4501/4502/4503 | Toxicity and Toxic Agents series *(require Biochemistry)* | | 3 s.h. |
| PHAR:4521 | High Throughput Screening in Drug Discovery (*offered spring, requires Biochemistry*) | | 1 s.h. |
| PHAR:4537 | Principles of Drug Metabolism *(offered spring, requires Biochemistry)* | | 3 s.h. |
| PHAR:4736 | Properties of Dosage Forms I *(offered fall)* | | 2 s.h. |
| PHAR:4737 | Properties of Dosage Forms II | | 2 s.h. |
| PHAR:4740 | Materials in Drug and Gene Delivery | | 3 s.h. |
| PHAR:4741 | Immunology and Immunotherapies | | 3 s.h. |
| PHAR:4800 | Chemical/Biophysical Properties of Drugs *(offered spring, requires Biochemistry)* | | 1 s.h. |
| PHAR:4xxx | Upper-level pharmacy courses available through the certificate programs | |  |

1. <https://www.engineering.uiowa.edu/current-students/academic-information/general-education-component>. Discuss with your CBE faculty advisor if you have questions about your GEC requirement.

   2 <https://cbe.engineering.uiowa.edu/undergraduate-program/undergraduate-handbook/chemical-engineering-curriculum#Advanced%20Chemical%20Science%20Electives>. Discuss with your CBE faculty advisor if you have questions about your advanced chemistry/science electives.

   3This course has prerequisites that can be waived with instructor approval. [↑](#endnote-ref-1)