Students in the MEng program are required to complete a minimum of **66 units** over the course of two years of study.

**A summary of the MEng curriculum is as follows:**

|  |  |
| --- | --- |
| **Description** | **Units** |
| Biopharmaceutical Processing | 27.0 |
| Capstone Design Project (TDP) | 12.0 |
| Quality & Regulatory | 6.0 |
| Other courses | 21.0 |
| **Total** | **66.0 units** |

**Core Courses:** All students must complete the core courses in order to complete the MEng degree.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1st Year FALL Core Courses**  **(Incoming students with Science Degrees)** | **Units** |  | **1st Year FALL Core Courses**  **(Incoming students with Engineering Degrees)** | **Units** |
| MEB 301 Mathematics for Scientists | 1.5 |  | MEB 307 Introduction to Biology and Biochemistry | 3.0 |
| MEB 304 Molecular Biology and Biotechnology | 1.5 |  | MEB 304 Molecular Biology and Biotechnology | 1.5 |
|  |  |  | MEB 305 Introduction to Bioprocess Fundamentals | 1.5 |
| MEB 306 Bioprocessing Fundamental Laboratory | 1.5 |  | MEB 306 Bioprocessing Fundamental Laboratory | 1.5 |
| MEB 312 Principles of Bioprocess Engineering | 1.5 |  | MEB 312 Principles of Bioprocess Engineering | 1.5 |
| MEB 317 CMC Regulatory and Quality | 3.0 |  | MEB 317 CMC Regulatory and Quality | 3.0 |
| MEB 323 Fluid Flow and Mass Transfer BP Operations | 3.0 |  |  |  |
| MEB 362 Mammalian Cell Culture LAB | 1.5 |  | MEB 362 Mammalian Cell Culture LAB | 1.5 |
| MEB 360 Microbial Fermentation | 1.5 |  | MEB 360 Microbial Fermentation | 1.5 |
| ALS/MEB 350 Financial Accounting | 1.5 |  | ALS/MEB 350 Financial Accounting | 1.5 |
| **Subtotal** | **16.5** |  | **Subtotal** | **16.5** |

|  |  |
| --- | --- |
| **1st Year SPRING Core Courses**  **(For All Students: Scientists and Engineers)** | **Units** |
|  |  |
| MEB 302 Principles of Bioreaction Engineering | 1.5 |
| MEB 303 Molecular Basis of Disease | 1.5 |
| MEB 310 Advanced Mammalian Cell Culture Engineering | 1.5 |
|  |  |
| MEB 311 Bioseparation Engineering Science | 1.5 |
| MEB 313 Advanced Principles of Bioprocess Engineering | 1.5 |
| MEB 315 Downstream processing Lab | 3.0 |
| MEB 361 Microbial Fermentation Lab | 1.5 |
| ALS/MEB 341 Healthcare and Life Sciences Industry Ethics | 1.5 |
| ALS/MEB 351 Corporate Finance | 3.0 |
| **Subtotal** | **16.5** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **2nd Year FALL Core Courses**  **(For All Students: Scientists and Engineers)** | **Units** |  | **2nd Year SPRING Core Courses**  **(For All Students: Scientists and Engineers)** | **Units** |
|  |  |  |  |  |
| MEB 403 Chemistry, Manufacturing & Controls  Regulation of Biologics | 1.5 |  | MEB 404 Emerging Therapeutics (Stem cells,  Gene Therapy, Tissue Engineering etc.) | 3.0 |
|  |  |  |  |  |
| MEB 408 Team Design Project (TDP) | 6.0 |  | MEB 405 Bioprocess Business Plan & Entrepreneurship | 1.5 |
| MEB 410 Principles of Bioprocess Engineering Design  and Practice | 1.5 |  | MEB406 Management of R&D in Biopharm | 1.5 |
| ALS/MEB 429 Bioseparations Engineering | 1.5 |  | MEB 408 Team Design Project (TDP) | 6.0 |
| ALS/MEB 359 Introduction to Bioscience Industry | 3.0 |  | MEB 409 Current Issues for FDA Regulated Products | 1.5 |
| **Subtotal** | **13.5** |  | **Subtotal** | **13.5** |

**Options and Elective Courses:** All MEng students may also choose Option and Elective Courses below:

|  |  |
| --- | --- |
| **Options and Elective Courses**  **(For All Students: Scientists and Engineers)** | **Units** |
| MEB 318 Study Abroad | 6.0 |
| MEB 319 Paid Internship (400 hours) | 0.0 |
| MEB 319 Non-Paid Internship (400 hours) | 6.0 |
| MEB 321 Research Project | 0.0 - 6.0 |
| ALS/MEB 497 Independent Study | 3.0 |
| ALS/MEB 428 Advanced Bioprocessing Research | 1.5 -3.0 |
| ALS/MEB 400 Team Masters’ Project | 3.0 |

**Academic Petitions:** Examples of requests include, but are not limited to, the following:

* Course overload: permission to take more than 19.5 units
* Exceptions to registration deadlines (late ADDs, late DROPs)
* Variances in cross registration and general education requirements
* Exceptions to graduation requirements or other KGI academic policies