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 |
| Team Master’s Project | 6.0 |
| Other courses | 15.0 |
| **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 302 Principle of Bioreaction Engineering  | 1.5 |  | MEB 302 Principle of Bioreaction Engineering  | 1.5 |
| MEB 304 Molecular Biology and Biotechnology  | 1.5 |  | MEB 304 Molecular Biology and Biotechnology  | 1.5 |
|  |  |  | MEB 305 Introduction to Bioprocess Fundamental | 1.5 |
| MEB 306 Bioprocessing Fundamental Laboratory  | 1.5 |  | MEB 306 Bioprocessing Fundamental Laboratory  | 1.5 |
|  |  |  | MEB 307 Introduction to Biology and Biochemistry | 3.0 |
| MEB 312 Principles of Bioprocess Engineering  | 1.5 |  | MEB 312 Principles of Bioprocess Engineering  | 1.5 |
| MEB 313 Advanced Bioprocess Engineering  | 1.5 |  | MEB 313 Advanced Bioprocess Engineering  | 1.5 |
| MEB 317 CMC Regulatory and Quality  | 3.0 |  | MEB 317 CMC Regulatory and Quality  | 3.0 |
| MEB 322 Heat Transfer Bioprocess Operations  | 1.5 |  |  |  |
| MEB 323 Fluid Flow and Mass Transfer BP Operations  | 1.5 |  |  |  |
| ALS/MEB 333 Pharmaceutical Development | 1.5 |  | ALS/MEB 333 Pharmaceutical Development | 1.5 |
| ALS/MEB 350 Financial Accounting  | 1.5 |  | ALS/MEB 350 Financial Accounting  | 1.5 |
| ALS/MEB 359 Introduction to Bioscience Industry  | 3.0 |  | ALS/MEB 359 Introduction to Bioscience Industry  | 3.0 |
| **Subtotal** | **21.0** |  | **Subtotal** | **21.0** |

|  |  |
| --- | --- |
| **1st Year SPRING Core Courses****(For All Students: Scientists and Engineers)** | **Units** |
| 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 Bioseparation Engineering Science Lab | 1.5 |
| ALS/MEB 341 Healthcare and Life Sciences Industry Ethics  | 1.5 |
| ALS/MEB 351 Corporate Finance  | 3.0 |
| MEB 360 Advanced Fundamental Microbial Fermentation  | 1.5 |
| MEB 361 Advanced Fundamental Microbial Fermentation LAB | 1.5 |
| MEB 362 Advanced Mammalian Cell Culture Engineering LAB  | 1.5 |
| **Subtotal** | **15** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 400 Team Master’s Project | 3.0 |  | MEB 400 Team Master’s Project | 3.0 |
| MEB 403 Chemistry, Manufacturing & Controls  Regulation of Biologics  | 1.5 |  | MEB 405 Bioprocess Business Plan & Entrepreneurialship  | 1.5 |
| MEB 404 Emerging Therapeutics (Stem cells,  Gene Therapy, Tissue Engineering etc.)  | 3.0 |  | MEB 408 Team Design Project (TDP)  | 6.0 |
| MEB 408 Team Design Project (TDP) | 6.0 |  | MEB 409 Current Issues for FDA Regulated Products  | 1.5 |
| MEB 410 Principles of Bioprocess Engineering Design  and Practice  | 1.5 |  | ALS/MEB 422 Bioseparations Engineering Lab | 1.5 |
|  |  |  | ALS/MEB 429 Bioseparations Engineering | 1.5 |
| **Subtotal** | **15.0** |  | **Subtotal** | **15.0** |

**Options and Elective Courses:** All MEng students are required to complete a non-unit summer internship. They 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 |

**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