Class of 2025 Graduation Requirements

Master of Engineering in Biopharmaceutical Processing (MEng)

Students in the MEng program are required to complete a minimum of 60 Credits over the course of two years of study.

- Biopharmaceutical Processing (15 credits)
- Biopharmaceutical Processing Labs (7.5 credits)
- Biopharmaceutical Capstone - Team Design Project (12 credits)
- Quality and Regulatory (4.5 credits)
- Other Business, Science courses (21 credits)

Students are also required to complete a 400-hour, paid, industry internship in the summer following their first year, and present an internship poster reviewed by KGI faculty/staff. Students also need to complete PDEV 5100 (Professional Development – 0 credit) course prior to the internship.

Program Requirements

<table>
<thead>
<tr>
<th>Fall 1st Year Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 5153 Engineering Fundamentals for Bioprocessing**</td>
<td>3</td>
</tr>
<tr>
<td>SCI 5500 Introduction to Biology and Biochemistry*</td>
<td>3</td>
</tr>
<tr>
<td>ENG 5100 Bioprocess Engineering Principles</td>
<td>1.5</td>
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<tr>
<td>ENG 5132 Introduction to Upstream Processing</td>
<td>1.5</td>
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<tr>
<td>ENG 5133 Introduction to Upstream Processing LAB</td>
<td>1.5</td>
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<tr>
<td>ENG 5151 Vector &amp; Strain Design LAB</td>
<td>1.5</td>
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<tr>
<td>SCI 6401 Fundamental Papers in Molecular Biology and Biotechnology</td>
<td>1.5</td>
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<tr>
<td>BUS 5000 Introduction to Bioscience Industry</td>
<td>3</td>
</tr>
<tr>
<td>PDEV 5000 Team Master's Project</td>
<td>3</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>16.5</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring 1st Year Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 5134 Advanced Upstream Processing LAB</td>
<td>1.5</td>
</tr>
<tr>
<td>ENG 5140 Bioseparations Engineering and Science</td>
<td>1.5</td>
</tr>
<tr>
<td>ENG 5141 Introduction to Bioseparations Engineering Lab</td>
<td>1.5</td>
</tr>
<tr>
<td>ENG 5142 Advanced Bioseparations Engineering Lab</td>
<td>1.5</td>
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<tr>
<td>MATH 5220 Data Analytics in R</td>
<td>1.5</td>
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<tr>
<td>MATH 5300 Machine Learning in the Life Sciences</td>
<td>1.5</td>
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<tr>
<td>REG 5310 Quality Systems and Regulation for Biologics</td>
<td>1.5</td>
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<tr>
<td>SCI 6311 Cell-Produced Therapeutics</td>
<td>1.5</td>
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<tr>
<td>PDEV 5000 Team Master's Project</td>
<td>3</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>15.0</strong></td>
</tr>
</tbody>
</table>

* Requirement for students with ENG background (assigned by MEng Program Director based on transcript)
** Requirement for students with SCI background (assigned by MEng Program Director based on transcript)
Program Requirement

Fall 2nd Year Courses | Credits
--- | ---
ENG 6100 Team Design Project (TDP) | 6
ENG 6132 Advanced Upstream Processing | 1.5
ENG 6140 Advanced Bioseparations Engineering | 1.5
REG 6310 Advanced Quality Topics for Biologics | 1.5
BUS 5100 Financial Accounting | 1.5
ENG/MATH/SCI #### Technical Elective (Can be opted either in Fall and/or in Spring semesters) | 0-1.5
BUS #### Elective (Can be opted either in Fall and/or in Spring semesters – total 3 credits)§ | 0-3§

Subtotal | 12.0 - 16.5

Spring 2nd Year Courses | Credits
--- | ---
ENG 6100 Team Design Project (TDP) | 6
ENG 6152 Bioprocessing for Emerging Therapeutics | 1.5
REG 6320 Advanced Regulatory Topics for Biologics | 1.5
BUS 6110 Bioprocess Economics | 1.5
ENG/MATH/SCI #### Technical Elective (Can be opted either in Fall and/or in Spring semesters) | 0-1.5
BUS #### Elective (Can be opted either in Fall and/or in Spring semesters – total 3 credits)§ | 0-3§
PDEV 5220 Healthcare and Life Sciences Industry Ethics | 1.5

Subtotal | 12.0 - 16.5

§ All MEng students must complete Business Elective Courses worth 3 credits from list below in Fall and/or Spring semester. Waiver from MEng Program Director required outside this list.

Electives

2nd Year BUS ELECTIVES | Credits
--- | ---
BUS 6710 Building an Entrepreneurial Organization | 2
BUS 6410 Leadership in Organizations | 1.5
BUS 6400 Organizational Behavior | 3
BUS 6600 Business Operations | 3
BUS 6500 Marketing Management | 3
BUS 6610 Supply Chain Biotech Operations | 3
BUS 6730 Applied Entrepreneurship | 3
BUS 6120 Valuation in the Life Sciences¶ | 1.5
BUS 6220 Drug Pricing and Reimbursement¶ | 1.5
BUS 6330 Intellectual Property Strategy¶ | 1.5
MATH 6510 Market Analytics¶ | 1.5

2nd Year ENG/MATH/SCI ELECTIVES | Credits
--- | ---
RES 6000 Independent Research | 1.5-3

Optional Courses: All MEng students may also choose Optional Courses from below

Optional Courses | Credits
--- | ---
RES 6000 Advanced Bioprocessing Research | 1.5-3
RES 6000 Independent Research | 1.5-3
RES 6010 Independent Study | 3
PDEV 5200 Team Masters’ Project | 3