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>
</tr>
<tr>
<td>ENG 5132 Introduction to Upstream Processing</td>
<td>1.5</td>
</tr>
<tr>
<td>ENG 5133 Introduction to Upstream Processing LAB</td>
<td>1.5</td>
</tr>
<tr>
<td>ENG 5151 Vector &amp; Strain Design LAB</td>
<td>1.5</td>
</tr>
<tr>
<td>SCI 6401 Fundamental Papers in Molecular Biology and Biotechnology</td>
<td>1.5</td>
</tr>
<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</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>
</tr>
<tr>
<td>MATH 5220 Data Analytics in R</td>
<td>1.5</td>
</tr>
<tr>
<td>MATH 5300 Machine Learning in the Life Sciences</td>
<td>1.5</td>
</tr>
<tr>
<td>REG 5310 Quality Systems and Regulation for Biologics</td>
<td>1.5</td>
</tr>
<tr>
<td>SCI 6311 Cell-Produced Therapeutics</td>
<td>1.5</td>
</tr>
<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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 6100 Team Design Project (TDP)</td>
<td>6</td>
</tr>
<tr>
<td>ENG 6132 Advanced Upstream Processing</td>
<td>1.5</td>
</tr>
<tr>
<td>ENG 6140 Advanced Bioseparations Engineering</td>
<td>1.5</td>
</tr>
<tr>
<td>REG 6310 Advanced Quality Topics for Biologics</td>
<td>1.5</td>
</tr>
<tr>
<td>ENG/MATH/SCI or TMP (PDEV 5000) Technical Elective (Can be opted either in Fall and/or in Spring semesters)</td>
<td>0-1.5</td>
</tr>
<tr>
<td>BUS Elective (Can be opted either in Fall and/or in Spring semesters – total 3 credits)²</td>
<td>0-3²</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>10.5 - 15.0</strong></td>
</tr>
</tbody>
</table>

## Spring 2nd Year Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 6100 Team Design Project (TDP)</td>
<td>6</td>
</tr>
<tr>
<td>ENG 6152 Bioprocessing for Emerging Therapeutics</td>
<td>1.5</td>
</tr>
<tr>
<td>REG 6320 Advanced Regulatory Topics for Biologics</td>
<td>1.5</td>
</tr>
<tr>
<td>BUS 5110 Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>ENG/MATH/SCI or TMP (PDEV 5000) Technical Elective (Can be opted either in Fall and/or in Spring semesters)</td>
<td>0-1.5</td>
</tr>
<tr>
<td>BUS Elective (Can be opted either in Fall and/or in Spring semesters – total 3 credits)²</td>
<td>0-3²</td>
</tr>
<tr>
<td>PDEV 5240 Life Sciences Industry Ethics</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>13.5 - 18.0</strong></td>
</tr>
</tbody>
</table>

²All MEng students must complete Business Elective Courses worth 3 credits from list below in Fall and/or Spring semester. They also must complete a Technical Elective course worth 1.5 credit either in Fall or in Spring semester in consultation with the Faculty Advisor and the MEng Program Director. Some suggested electives are listed below.

## Electives

### 2nd Year BUS ELECTIVES

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 6710 Building an Entrepreneurial Organization</td>
<td>2</td>
</tr>
<tr>
<td>BUS 6410 Leadership in Organizations</td>
<td>1.5</td>
</tr>
<tr>
<td>BUS 6400 Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>BUS 6600 Business Operations</td>
<td>3</td>
</tr>
<tr>
<td>BUS 6500 Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>BUS 6610 Supply Chain Biotech Operations</td>
<td>3</td>
</tr>
<tr>
<td>BUS 6730 Applied Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>BUS 6120 Valuation in the Life Sciences³</td>
<td>1.5</td>
</tr>
<tr>
<td>BUS 6220 Drug Pricing and Reimbursement³</td>
<td>1.5</td>
</tr>
<tr>
<td>BUS 6330 Intellectual Property Strategy³</td>
<td>1.5</td>
</tr>
<tr>
<td>MATH 6510 Market Analytics</td>
<td>1.5</td>
</tr>
</tbody>
</table>

### 2nd Year ENG/MATH/SCI ELECTIVES

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RES 6010 Independent Study</td>
<td>1.5-3</td>
</tr>
<tr>
<td>RES 6001/6000 Independent Research</td>
<td>1.5-3</td>
</tr>
<tr>
<td>PDEV 6000 Team Master’s Project (TMP)</td>
<td>3</td>
</tr>
</tbody>
</table>

³Course has Pre-requisites not part of MEng curriculum Contact instructor for approval prior to registration