

## Class of 2027 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 (12 credits)
- Biopharmaceutical Processing Labs (7.5 credits)
- Biopharmaceutical Capstone - Team Design Project (12 credits)
- Quality and Regulatory (3 credits)
- Other Business, Science courses (25.5 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/stuff. Students also need to complete PDEV 5100 (Professional Development – 0 credit) course prior to the internship.

### Program Requirements

Fall 1 <sup>st</sup> Year Courses	Credits
ENG 5153 Engineering Fundamentals for Bioprocessing**	3
SCI 5500 Introduction to Biology and Biochemistry*	
ENG 5100 Bioprocess Engineering Principles	1.5
ENG 5132 Introduction to Upstream Processing	1.5
MATH 5100 Data Analytics in Python	1.5
ENG 5151 Vector & Strain Design LAB	1.5
ENG 5110: Statistical Methods and Experimental Design in Bioprocessing	1.5
BUS 5000 Introduction to Bioscience Industry	3
PDEV 5000 Team Master's Project	3
<b>Subtotal</b>	<b>16.5</b>

Spring 1 <sup>st</sup> year Courses	Credits
ENG 5133 Introduction to Upstream Processing LAB	1.5
ENG 5140 Bioseparations Engineering and Science	1.5
ENG 5141 Introduction to Bioseparations Engineering Lab	1.5
ENG 5142 Advanced Bioseparations Engineering Lab	1.5
ENG 5134 Advanced Upstream Processing LAB	1.5
MATH 5300 Machine Learning in the Life Sciences	1.5
REG 5310 Quality Systems and Regulation for Biologics	1.5
SCI 6311 Cell-Produced Therapeutics	1.5
PDEV 5000 Team Master's Project	3
<b>Subtotal</b>	<b>15.0</b>

\* 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 Requirements

Fall 2 <sup>nd</sup> Year Courses	Credits
ENG 6100 Team Design Project (TDP)	6
ENG 6132 Advanced Upstream Processing	1.5
ENG 6140 Advanced Bioseparations Engineering	1.5
SCI 6401 Fundamental Papers in Molecular Biology and Biotechnology	1.5
REG 6310 Advanced Quality Topics for Biologics	1.5
ENG/MATH/SCI/RES ##### or TMP (PDEV 5000)	0-1.5 <sup>§</sup>
Technical Elective (Can be opted either in Fall and/or in Spring semesters)	
BUS ##### Elective (Can be opted either in Fall and/or in Spring semesters – total 3 credits) <sup>§</sup>	0-3 <sup>§</sup>
<b>Subtotal</b>	<b>12.0 - 16.5</b>

Spring 2 <sup>nd</sup> Year Courses	Credits
ENG 6100 Team Design Project (TDP)	6
ENG 6152 Bioprocessing for Emerging Therapeutics	1.5
BUS 5110 Corporate Finance	3
PDEV 5240 Life Sciences Industry Ethics	1.5
ENG/MATH/SCI/RES ##### or TMP (PDEV 5000)	0-1.5
Technical Elective (Can be opted either in Fall and/or in Spring semesters)	
BUS ##### Elective (Can be opted either in Fall and/or in Spring semesters – total 3 credits) <sup>§</sup>	0-3 <sup>§</sup>
<b>Subtotal</b>	<b>12.0 - 16.5</b>

<sup>§</sup> All 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	Credits
BUS 6710 Biotechnology Entrepreneurship	1.5
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 6220 Drug Pricing and Reimbursement <sup>¶</sup>	1.5
MATH 6510 Market Analytics <sup>¶</sup>	1.5

2nd Year ENG/MATH/SCI ELECTIVES	Credits
RES 6010 Independent Study	1.5-3
RES 6001/6000 Independent Research	1.5-3
PDEV 6000 Team Master's Project (TMP)	3
REG 6320 Advanced Regulatory Topics for Biologics	1.5

(<sup>¶</sup>) Course has Pre-requisites not part of MEng curriculum Contact instructor for approval prior to registration