

Bioengineering				2006-2009 REQUIREMENTS		
<b>(please note changes to requirements indicated in red and on page 2)</b>						
FIRST YEAR				REQUIRED	PRE-REQS	TERMS
FALL	WINTER	SPRING	SUMMER	Math 31A		
				Math 31B		
				Math 32A		
				Math 32B		
				Math 33A		
				Math 33B		
				Chem 20A		
<b>SECOND YEAR</b>				Chem 20B		
FALL	WINTER	SPRING	SUMMER	Chem 20L		
				Chem 30A		
				Chem 30AL		
				Chem 30B		
				Chem 30BL		
				Bioengr 10		
				Lifesci 2		
<b>THIRD YEAR</b>				Lifesci 3		
FALL	WINTER	SPRING	SUMMER	Lifesci 4		
				Physics 1A		
				Physics 1B		
				Physics 4AL		
				Physics 4BL		
				Physics 1C		
				CS 31		
<b>FOURTH YEAR</b>				Bioengr 100		
FALL	WINTER	SPRING	SUMMER	Bioengr 110		
				Bioengr 120		
				<b>Bioengr 165</b>	<b>(see page 2)</b>	
				<b>Bioengr 176</b>	<b>(see page 2)</b>	
				Bioengr 180		
				<b>Bioengr 180L</b>	<b>(see page 2)</b>	
				<b>Bioengr 181</b>	<b>(see page 2)</b>	
<b>FIFTH YEAR</b>				<b>Bioengr 181L</b>	<b>(see page 2)</b>	
FALL	WINTER	SPRING	SUMMER	Bioengr 182A		
				Bioengr 182B		
				<b>Bioengr 182C</b>	<b>(see page 2)</b>	
				Chem 153A		
				Biomed Elective #1		
				Biomed Elective #2		
				TBR #1 <a href="http://www.seasoasa.ucla.edu/current/technical_breadth_files/TBA.pdf">http://www.seasoasa.ucla.edu/current/technical_breadth_files/TBA.pdf</a>		
				TBR #2 <a href="http://www.seasoasa.ucla.edu/current/technical_breadth_files/TBA.pdf">http://www.seasoasa.ucla.edu/current/technical_breadth_files/TBA.pdf</a>		
				TBR #3 <a href="http://www.seasoasa.ucla.edu/current/technical_breadth_files/TBA.pdf">http://www.seasoasa.ucla.edu/current/technical_breadth_files/TBA.pdf</a>		
				<b>GE COURSES (Including Writing II)</b>		
				English 3		
				Engineering Ethics	satisfied w/BIOENGR 165 or ENGR 183 or ENGR 185	
				FAH (elective 1)		
				FAH (elective 2)		
				FSC (elective 3)		
				FSC (elective 4)		
				FSI (elective 5)	satisfied with Life Science 2	

**Please note changes to requirements as outlined below:**

**Bioengr 165** - If you have not completed Bioengr 165, you may be take either Engr 183 or 185 instead. No petition is required for this substitution.

**Bioengr 176** - If you have not completed Bioengr 176, substitute with Biomed CM180 "Introduction to Biomaterials". Biomed CM180 is planned to be offered for Winter 09. No petition is required for this substitution.

**Bioengr 180L, 181, 181L, 182C** - see page 3 for course options  
BE 180L will be offered, but due to class size limitations BE180L will not be required.  
BE 181, BE181L, and BE182C will not be offered.

The following courses can count as BME electives, which can also be used to replace courses that were removed from the required curriculum (BE 180L, BE 181, BE 181L, & BE 182C):

1. Any BE non-core (non-required) course\*
2. Biol Chem CM153G (Macromolecular Structure)
3. Biomath 204 (Biomedical Data Analysis)\*\*
4. Biostat 100A (Introduction to Biostatistics)
5. Biostat 100B (Introduction to Biostatistics)
6. Biostat 110A (Basic Biostatistics)
7. Biostat 110B (Basic Biostatistics)
8. Biostat 410 (Statistical Methods in Clinical Trials)\*\*
9. Chem C140 (Bionanotechnology)
10. Chem C181 (Polymer Chemistry)
11. ChemE 100 (Fundamentals of Chemical and Biomolecular Engineering)
12. ChemE 101A (Transport Phenomena)
13. ChemE 101B (Heat Transfer)
14. ChemE 102A (Thermodynamics)
15. ChemE 103 (Separation Processes)
16. ChemE 109 (Numerical and Mathematical Models in Chemical and Biomolecular Engineering)
17. ChemE C115 (Biochemical Reaction Engineering)
18. ChemE C125 (Bioseparations and Bioprocess Engineering)
19. EE 100 (Electrical and Electronic Circuits)
20. EE 102 (Systems and Signals)
21. MAE 103 (Elementary Fluid Mechanics)
22. MAE 187L (Biosensors Laboratory)
23. MCD BIO 168 (Stem Cell Biology)
24. MIMG CM133 (Frontiers in Biotechnology)
25. MIMG 185A (Immunology)
26. Mol Med Pharm M110A (Drugs: Mechanisms, Uses, and Misuse)
27. Mol Med Pharm M110B (Drugs: Mechanisms, Uses, and Misuse)
28. MSE 104 (Science of Engineering Materials)
29. MSE 110 (Introduction to Materials Characterization A)
30. MSE 111 (Introduction to Materials Characterization B)
31. MSE 120 (Physics of Materials)
32. MSE 130 (Phase Relations in Solids)
33. MSE 132 (Structure and Properties of Metallic Alloys)
34. MSE 140 (Materials Selection and Engineering Design)
35. MSE 143A (Mechanical Behavior of Materials)
36. MSE 150 (Introduction to Polymers)
37. MSE 151 (Structure and Properties of Composite Materials)
38. MSE 160 (Introduction to Ceramics and Glasses)
39. MSE 161 (Processing of Ceramics and Glasses)
40. Phys Sci 100 (Experimental Statistics)
41. Phys Sci 135 (Dynamical Systems Modeling of Physiological Processes)
42. Phys Sci C150 (Musculoskeletal Mechanics)
43. Phys Sci C152 (Musculoskeletal Anatomy, Physiology, and Biomechanics)
44. Phys Sci 154 (Cellular Communication and Regulation of Physiological Processes)
45. Phys Sci 155 (Development and Structure of Musculoskeletal System)

*To help guide your selections from the above courses, see below.*

**If you are interested in biotechnology, you might want to choose from the following:**

1. BME C101 (BE undergrads may take this course starting Fall 2009)
2. BME CM145 (Molecular Biotechnology for Engineers)
3. BE M183 (Targeted Drug Delivery and Controlled Drug Release)
4. MAE 103 (Elementary Fluid Mechanics)
5. MIMG 185A (Immunology)
6. MIMG CM133 (Frontiers in Biotechnology)
7. Mol Med Pharm M110A (Drugs: Mechanisms, Uses, and Misuse)
8. Mol Med Pharm M110B (Drugs: Mechanisms, Uses, and Misuse)
9. Biomath 204 (Biomedical Data Analysis)\*\*
10. Biostat 100A (Introduction to Biostatistics)
11. Biostat 100B (Introduction to Biostatistics)
12. Biostat 110A (Basic Biostatistics)
13. Biostat 110B (Basic Biostatistics)
14. Biostat 410 (Statistical Methods in Clinical Trials)\*\*
15. ChemE 100 (Fundamentals of Chemical and Biomolecular Engineering)
16. ChemE 101A (Transport Phenomena)
17. ChemE 101B (Heat Transfer)
18. ChemE 102A (Thermodynamics)
19. ChemE 103 (Separation Processes)
20. ChemE 109 (Numerical and Mathematical Models in Chemical and Biomolecular Engineering)
21. ChemE C115 (Biochemical Reaction Engineering)
22. ChemE C125 (Bioseparations and Bioprocess Engineering)
23. Phys Sci 100 (Experimental Statistics)
24. Phys Sci 135 (Dynamical Systems Modeling of Physiological Processes)

**If you are interested in bioinstrumentation, you might want to choose from the following:**

1. BE M131 (Nanopore Sensing)
2. BME 150/MAE 180/EE 150 (MEMS)
3. BME 150L/MAE 180L/EE 150L (MEMS Lab)
4. BE M172 (Design of Minimally Invasive Surgical Tools)
5. EE 100 (Electrical and Electronic Circuits)
6. EE 102 (Systems and Signals)
7. MAE 187L (Biosensors Laboratory)

**If you are interested in biomaterials/tissue engineering, you might want to choose from the following:**

1. BE M104 ( Physical Chemistry of Biomacromolecules)
2. BE M105 (Biopolymer Chemistry and Bioconjugates)
3. Biol Chem CM153G (Macromolecular Structure)
4. BME CM140 (Introduction to Biomechanics)
5. BE M183 (Targeted Drug Delivery and Controlled Drug Release)
6. BME C185 (Introduction to Tissue Engineering)
7. BME C187 (Applied Tissue Engineering: Clinical and Industrial Perspectives)
8. Chem C140 (Bionanotechnology)
9. Chem C181 (Polymer Chemistry)
10. MCD BIO 168 (Stem Cell Biology)
11. MSE 104 (Science of Engineering Materials)
12. MSE 110 (Introduction to Materials Characterization A)
13. MSE 111 (Introduction to Materials Characterization B)
14. MSE 120 (Physics of Materials)
15. MSE 130 (Phase Relations in Solids)
16. MSE 132 (Structure and Properties of Metallic Alloys)
17. MSE 140 (Materials Selection and Engineering Design)
18. MSE 143A (Mechanical Behavior of Materials)
19. MSE 150 (Introduction to Polymers)
20. MSE 151 (Structure and Properties of Composite Materials)
21. MSE 160 (Introduction to Ceramics and Glasses)
22. MSE 161 (Processing of Ceramics and Glasses)
23. Phys Sci C150 (Musculoskeletal Mechanics)
24. Phys Sci C152 (Musculoskeletal Anatomy, Physiology, and Biomechanics)
25. Phys Sci 154 (Cellular Communication and Regulation of Physiological Processes)
26. Phys Sci 155 (Development and Structure of Musculoskeletal System)

**Note: Although the above courses are approved, if you need additional classes to choose from, you can click on the links to the different electives on the following website:**  
<http://www.bme.ucla.edu/programs/studyplans.html>

- \* Only 4 units of BE 199 can be counted as a BME elective & a petition is still required for the BE 199 to satisfy a BE elective.
- \*\* Graduate level courses subject to approval of HSSEAS petition at 6426 BH.