Bioengineering: Biomedical Imaging and Bioinstrumentation – Program Map – Catalog Year 2021 – 22

First Year
- MATH 021: Calc I for Sci & Engr (4)
- MATH 022: Calc II for Sci & Engr (4)
- PHYS 008 & Lab: Intro Physics I (4)
- CHEM 002: General Chem I (4)
- BIOE 060: Signals, Systems and Digital Imaging Processing (4)
- BIOE 021: Introduction to Computing with Python (4)
- PHYS 009 & Lab: Intro Physics II (4)
- CHEM 010: General Chem II (4)
- MATH 024: Lin Algebra/Diff Equations (4)
- MATH 023: Vector Calculus (4)
- WRI 010: College Wri & Comp (4)
- BIOE 113: Bioinstrumentation (4)
- BIOE 115: Biomechanics (4)

Semester 3
- MATH 024: Lin Algebra/Diff Equations (4)
- PHYS 009 & Lab: Intro Physics II (4)
- WRI 010: College Wri & Comp (4)
- CHEM 010: General Chem II (4)
- BIOE 045: Introduction to Biomaterials (4)
- ENGR 030: Introduction to Conservation Principles in Engineering (4)
- SPRK 001: Spark Seminar (4)
- ENGR 191: Professional Seminar (1)
- BIOE 001: Bioengineering Seminar (1)
- BIOE 065: Biocircuits Theory (4)
- BIOE 002 and Lab: Molecular Biology for Engineers (5)
- BIOE 100: Physiology for Engineers (4)
- BIOE 115: Biomechanics (4)
- BIOE 166: Bioelectronics (3)
- BIOE 127: Biomedical Instrumentation Lab (2)

Semester 4
- MATH 023: Vector Calculus (4)
- MATH 032: Probability and Statistics (4)
- BIOE 002 and Lab: Molecular Biology for Engineers (5)
- BIOE 010: Biothermodynamics (4)
- BIOE 114: Biomechanics (4)
- BIOE 113: Biomedical Instrumentation Lab (2)
- ENGR 193: Engineering Capstone Design I (2)
- ENGR 194: Engineering Capstone Design II (3)
- Technical Elective (Complete 4 units):
  - BioE 135 (4 units)
  - BioE 140 (4 units)
  - BioE 195 (1-4 units)
  - Any other upper division BioE course
  - MSE 114 (4)
  - Bio 003 (4)
  - MSE 113 (3)
  - MSE 126 (4)

Semester 5
- BIOE 130: Biothermodynamics (4)
- BIOE 115: Biomechanics (4)
- BIOE 106: Cell Bio for Engineers (4)
- BIOE 006: Biocircuits Theory (4)
- BIOE 104: Biotransport Phenomena (4)
- BIOE 113: Bioinstrumentation (4)
- ENGR 193: Engineering Capstone Design I (2)
- ENGR 194: Engineering Capstone Design II (3)
- Social Science, Arts, and Humanities GE (4)
- Social Science, Arts, and Humanities GE (4)
- BioE 135 (4 units)

Semester 6
- BIOE 130: Biothermodynamics (4)
- BIOE 115: Biomechanics (4)
- BIOE 106: Cell Bio for Engineers (4)
- BIOE 006: Biocircuits Theory (4)
- BIOE 104: Biotransport Phenomena (4)
- BIOE 113: Bioinstrumentation (4)
- ENGR 193: Engineering Capstone Design I (2)
- ENGR 194: Engineering Capstone Design II (3)
- Social Science, Arts, and Humanities GE (4)

Semester 7
- BIOE 130: Biothermodynamics (4)
- BIOE 115: Biomechanics (4)
- BIOE 106: Cell Bio for Engineers (4)
- BIOE 006: Biocircuits Theory (4)
- BIOE 104: Biotransport Phenomena (4)
- BIOE 113: Bioinstrumentation (4)
- ENGR 193: Engineering Capstone Design I (2)
- ENGR 194: Engineering Capstone Design II (3)
- Social Science, Arts, and Humanities GE (4)

Semester 8
- BIOE 130: Biothermodynamics (4)
- BIOE 115: Biomechanics (4)
- BIOE 106: Cell Bio for Engineers (4)
- BIOE 006: Biocircuits Theory (4)
- BIOE 104: Biotransport Phenomena (4)
- BIOE 113: Bioinstrumentation (4)
- Social Science, Arts, and Humanities GE (4)

Intellectual Badge Completion:
To complete badges, students must overlap Social Science, Arts, and Humanities GE’s with badge categories. See page 2.
General Education Requirements – PAY ATTENTION TO

Crossroads – Take BioE 135 (This course also counts a technical elective)

AREA B: Social Science, Arts and Humanities. Students must take three courses in the area of Social Science, Arts and Humanities. At least one course must be from Social Science and one course must be from Arts and Humanities.

• Social Science – There is a place holder for this course in the flow chart. You will need to select a course. Cross selection with Intellectual Experience Badges.
• Arts and Humanities – There is a place holder for this course. You will need to select a course. Cross with Intellectual Experience Badges.
• Social Science, Arts and Humanities – There is a place holder for this course. You will need to select a course. Cross with Intellectual Experience Badges.

Intellectual Experience Badges – One course can count for a maximum of two badges.

<table>
<thead>
<tr>
<th>Scientific Method</th>
<th>Literary and Textual Analysis</th>
<th>Media and Visual Analysis</th>
<th>Quantitative and Numerical Analysis</th>
<th>Societies and Cultures of the Past</th>
<th>Diversity and Identity</th>
<th>Global Awareness</th>
<th>Sustainability</th>
<th>Ethics</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOE – Bioinstrumentation</td>
<td>Completed with Major Requirements</td>
<td>Completed with Major Requirements</td>
<td>Completed with Major Requirements</td>
<td>Take one class that overlaps with SSHA GE</td>
<td>Completed with Major Requirements</td>
<td>Take one class that overlaps with SSHA GE</td>
<td>Take one class that overlaps with SSHA GE</td>
<td>Completed with Major Requirements</td>
</tr>
</tbody>
</table>

Suggested Courses to overlap Social Science, Arts and Humanities courses and Intellectual Experience Badges

• Social Science – ANTHR 005
• Arts and Humanities – CCST 060, CRES 001, CRES 076A, ENG 032, GASP 006, GASP 055B, GASP 060, GASP 076A, HIST 055, SPAN 060
• Social Science, Arts and Humanities – Select a Social Science, Arts, and Humanities course from [https://ge.ucmerced.edu/intellectual-experience-badges/global-awareness](https://ge.ucmerced.edu/intellectual-experience-badges/global-awareness). Do not select a course in Natural Science (Bio, ESS, Phys) or Engr (Engr, ME, BioE, CE, EnvE, CSE, MSE).

Subject to availability and updating, always check your Audit.