2021-2022 Biomolecular Engineering and Bioinformatics: Biomolecular

Mathematics
- MATH 3 or math placement of 400 or higher
  MATH 19A
  Calculus I [F/W/Sp/Su]
- MATH 19A or MATH 20A
  MATH 19B
  Calculus II [F/W/Sp/Su]
- MATH 3 or math placement of 300 or higher
  AM 10
  Mathematical Methods of Engineers I [F/W/Sp]
- MATH 19B or MATH 20B
  STAT 131
  Intro to Probability Theory [F/W/Sp]
- MATH 19B or MATH 20B
  STAT 206
  Applied Bayesian Statistics [W]

Chemistry & Biochemistry
- MATH 3 or math placement of 400 or higher
  CHEM 1A
  General Chemistry [F/W/Sp/Su]
- CHEM 1B
  General Chemistry/Lab [F/W/Sp/Su]
- CHEM 1A
  CHEM 1C/N
  General Chemistry/Lab [F/W/Sp/Su]
- CHEM 1B and 1C
  CHEM 8A
  Organic Chemistry [F/W/Sp]
- CHEM 8A
  CHEM 8B
  Organic Chemistry [W/Sp]
- CHEM 8B and BIOL 20A
  BIOC 100A
  Biochemistry and Molecular Biology [F]
- BIOL 100A
  BIOL 100B
  Biochemistry and Molecular Biology [W]

Biology & Physics
- CHEM 1A
  BIOL 20A
  Cell and Molecular Biology [F/W/Sp/Su]
- PHYS 5A/L
  Introduction to Physics I [F]
- PHYS 5A/L, corequisite of
  PHYS 5B/M
  Introduction to Physics II [Sp]

Humanities
- BME 80G
- ELWR and BIOL 20A
  BIOL 105
  Technical Writing for Biomolecular Engineers [F/W/Sp]
  OR
  ELWR and CSE 30 or BME 160
  BIOL 105
  Technical Writing for Computer Engineers [F/W/Sp]

Elective: Course used as an Elective cannot be used to satisfy other major requirements
- AM 147, BIOL 115*, METX 119, METX 140, BIOC 100C, BME 127H, BME 128L, BME 133, BME 130, BME 132, BME 140, BME 177, BME 178, ECE 104, or any 5-credit biomolecular engineering graduate course

Genetics & Bioinformatics
- BIOL 20A
  BME 105
  (Strongly Recommended) Genetics in the Genomics Era [F]
  OR
  BIOL 20A and BIOL 205
  BME 105
  Genomics [F/W/Sp/Su]
- BIOL 20A
  BME 160 (6 units)
  Research Programming in the Life Sciences [W/Sp]
- BIOL 20A and BIOL 205
  BME 163 (3 units)
  Applied Visualization and Analysis of Scientific Data [Sp]

Exit Requirements
Requirements must be completed by the end of a student’s final quarter.
1. Portfolio
2. Exit Survey
3. Exit Interview

Modeling & Design Sequence
Choose one of the following sequences
- BIOL 20A and BIOC 100A
  BME 128
  Protein Engineering [not offered in 2021-22]
  &
  BME 128 and BIOC 20L or BME 21L
  BME 128L (2 units)
  Protein Engineering Lab. [not offered in 2021-22]
- BIOL 20A
  BME 177
  Engineering Stem Cells [Sp]
  &
  BME 128 and BIOC 20L or BME 21L
  BME 128L (2 units)
  Protein Engineering Lab. [not offered in 2021-22]
  &
  STAT 131 and AM 20
  AM 115
  Stochastic Modeling in Biology [Sp]

Biomolecular Capstone: Students must complete one of the following:
- **BIOE 20B**, **BME 230A**
  Introduction to Computational Genomics and Systems Biology [W]
- **BME 160, STAT 131, and prev. or conc. Enrollment in BIOC 100A**
  **BME 205** Biomolecular Models and Algorithms [F]
- **BME 205**
  **BME 230A**
  **BME 205** Biomolecular Models and Algorithms [W]

Laboratory Courses: Choose one Sequence
- (Strongly Recommended)
  BME 21L
  Intro. To Basic Laboratory Techniques [Sp]
  &
  BME 21L and Chem 1B/M
  (Strongly Recommended)
  BME 22L & BME 23L
  Foundations of Design and Experimentation in Molecular Biology I & II BME 22L [F]
  BME 23L [W]
- **BIOE 20B**, **BME 230A**
  Introduction to Computational Genomics and Systems Biology [W]

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**Legend**

Ω Students with no prior programming experience are advised to take CSE 20 prior to BME 160

# The Bioinformatics capstone is programming heavy. Students interested in this capstone are advised to take additional programming classes.

α The thesis option consists of 12 credits of Independent Study (BME 198), Field Study (BME 193), or Senior Thesis Research (BME 195) in Biomolecular Engineering; and BME 123T Senior Thesis Writing (5 units). Students pursuing the senior thesis option must write a two-page thesis proposal and seek approval of their project from the undergraduate director in the quarter preceding the independent study courses, typically spring quarter of the third year. Students spend three or more quarters working on their thesis projects. These students must enroll in BME 123T, Senior Thesis Writing, before completing their thesis.

* Denotes course with additional prerequisites

Student Name:

Adviser Name/Notes: