### 2023 – 2024 Biomolecular Engineering and Bioinformatics: Bioinformatics

**Math & Statistics**
- MATH 3 or math placement of 400 or higher
- MATH 19A Calculus I [F/W/Sp/Su]
- MATH 19B Calculus II [F/W/Sp/Su]
- MATH 19A or MATH 19B; prior programming recommended
  - CSE 16 Discrete Math [F/W/Sp]
- MATH 19B
  - STAT 131 Intro to Probability Theory [F/W/Sp/Su]
  - STAT 131
    - Classical and Bayesian Inference [W/Sp]
    - OR
    - STAT 131 and permission from instructor
  - STAT 206 Applied Bayesian Statistics [W]

**Chemistry**
- Select one of the following General Chemistry series:
  - Chem 1 series for students who started in Fall 2022 or earlier.
  - CHEM 1A
  - CHEM 1B/M
  - CHEM 1C/N
  - CHEM 2 or math placement of 200 or higher
  - CHEM 3A
  - CHEM 3B
  - CHEM 3B/BL
  - CHEM 3C/L
- Chem 4 Prep ALEKS module.
  - Math 3 or Math placement score of 300 or higher.
  - CHEM 4A/AL
  - Advanced General Chemistry [F]
  - CHEM 4B/BL
  - Advanced General Chemistry [W]

**Modeling & Design**
- Choose one of the following sequences
  - Math 19B and AM 10
    - AM 20
      - Math Methods for Engineers II [W/Sp]
    - AM 115
      - Stochastic Modeling in Biology [Sp]
  - Math 19B and AM 10
    - AM 30
      - Multivariate Calculus for Engineers [F/Sp]
    - CSE 40 or Stat 132, CSE 101, AM 30, and Stat 131
      - Machine Learning [F/Sp]
  - Math 19B and AM 10
    - AM 30
      - Multivariate Calculus for Engineers [F/Sp]
    - CSE 40 or Stat 132; and CSE 101
      - Applied Machine Learning [F/W/Sp]

**Programming**
- BME 20A
  - BME 160 (6 units)
    - Research Programming in the Life Sciences [W/Sp]
  - BME 163 (3 units)
    - Applied Visualization and Analysis of Scientific Data [Sp]
  - CSE 20 or BME 160; and Math 3 or Math 19A
    - CSE 30 (7 units)
      - Programming Abstractions: Python [F/W/Sp]
  - CSE 12 or BME 160 and 135
    - and CSE 16 and CSE 30 and Math 19B
    - CSE 101
      - Introduction to Data Structures and Algorithms [F/W/Sp]
  - CSE 12 or BME 160 and 135
    - and CSE 16 and CSE 30 and Math 19B
    - CSE 182
      - Introduction to Database Management Systems [Sp]
  - CSE 16 or BME 160; and CSE 135
    - CSE 182
      - Introduction to Database Management Systems [Sp]

**Bioinformatics Capstone**
- BME 205
  - Bioinformatics Models and Algorithms [F]
  - BME 230A
    - Introduction to Computational Genomics and Systems Biology [W]

**Biology, Organic Chemistry, and Biochemistry**
- CHEM 1A, CHEM 3A, or CHEM 4A
  - BIOL 20A
    - Cell and Molecular Biology [F/W/Sp/Su]
  - CHEM 8A
    - Organic Chemistry [F/W/Sp/Su]
  - CHEM 8B
    - Organic Chemistry [W/Sp/Su]

**Humanities**
- BME 80G
- ELWR and BME 20A
  - BME 155
    - Technical Writing for Biomolecular Engineers [F/W/Sp]
    - OR
    - ELWR and CSE 12 or CSE 15 or CSE 30 or BME 160
    - CSE 185E
      - Technical Writing for Computer Engineers [F/W/Sp]

**Bioinformatics & Elective**
- BME 105 or BME 105 or BIOC 100A or declared BINF major
  - BME 110
    - Computational Biology Tools [F/W/Sp]
  - BME 185
    - Biomolecular Engineers [F/W/Sp]

**Elective**
- One of the following (course used as an Elective cannot be used to satisfy other major requirements):
  - AM 147, BME 118, BME 122H, BME 128, BME 128L, BME 130, BME 132, BME 140, BME 175, BME 177, BME 177L, BME 178, BIOC 100B, BME 142, BME 144, METX 100, METX 140, or 5-unit BME grad course

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# 2023 – 2024 Biomolecular Engineering and Bioinformatics: Bioinformatics

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### Legend

* Denotes Prerequisite

+ Students may take CSE 180 in place of CSE 182; however, BMEB: Bioinformatics students do not have registration priority

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

^ Students may petition to substitute Math 21 for AM 10, Math 24 for AM 20, or Math 23A for AM 30 if they can show MATLAB proficiency at the level of students in the AM classes they are replacing. Matlab Training: [https://its.ucsc.edu/software/matlab.html](https://its.ucsc.edu/software/matlab.html)

### Exit Requirements

Students are required to submit a portfolio, exit survey, and attend an exit interview. The portfolios must be turned in by the last day of the quarter of graduation, and will be reviewed quarterly by the undergraduate director. Exit interviews are scheduled during the last week of the quarter by Baskin Engineering advising office, generally as small group interviews. Additional information can be found in the program catalog statement.

1. Portfolio
2. Exit Survey
3. Exit Interview

Student name: