

Articulation Agreement by Major

Effective during the 2022-2023 Academic Year

To: University of California, Merced
2022-2023 General Catalog, Semester

From: De Anza College
2022-2023 General Catalog, Quarter

Bioengineering, Biotechnology Emphasis, B.S.

ADMISSIONS MAJOR SELECTION CRITERIA

Thank you for your interest in UC Merced!

For admission to the **Bioengineering, Biotechnology, B.S.** major, students must earn an overall transferrable GPA of 2.4 or better, and complete classes articulated with the following UC Merced courses by the end of spring term prior to fall enrollment or by the end of fall term prior to spring enrollment. All Major Preparation courses requires a "C" or better.

REQUIRED major preparation courses:

- CHEM 002
- MATH 021, MATH 022, MATH 023, MATH 024
- PHYS 008 & PHYS 008L, PHYS 009 & PHYS 009L

Starting for Fall 2023 Applicants:

- ++, ** BIOE 002 and BIOE 002L
- ++ CHEM 010

++ Starting for Fall 2023 applicants, Bioengineering is proposing BIOE 002, BIOE 002L and CHEM 010 be completed for selection. Applicants are strongly encouraged to complete these courses by the end of spring 2023 semester/quarter to be prepared when this proposal is approved.

** BIOE 002/002L is an admissions requirement and Junior level transfer students from California Community Colleges can complete articulated courses with BIO 002/002L in lieu of BIOE 002/002L for admissions. **This is not allowed for any other student. Any other student must complete BIOE 002/002L.**

Additional Lower Division Requirements:

- BIOE 001, BIOE 021, BIOE 045
- *CHEM 008 and *CHEM 008L
- ENGR 030, *ENGR 065, ENGR 080
- Technical Elective: BIO 003 (Only lower division course listed, please see [catalog](#) for Upper Division courses that also satisfies this requirement).

*CHEM 008 & *CHEM 008L and *ENGR 065 are recommended to be completed prior to Transfer.

AP Exam Score & Course Exemptions

- An AP Biology score of 4 or 5 exempts BIO 001 and BIO 001L
- An AP Mathematics: Calculus AB score of 4 or 5 exempts Math 021
- An AP Mathematics: Calculus BC score of 3 or higher exempts MATH 021
- An AP Mathematics: Calculus BC score of 4 or 5 exempts Math 021 and Math 022
- An AP Mathematics: Calculus BC Subscore AB score of 3 or higher exempts Math 021
- An AP Chemistry score of 5 exempts CHEM 002 and CHEM 010
- An AP Physics: Physics C: Mechanics score of 5 exempts PHYS 008 and PHYS 008L

UC Merced Advance Placement (AP) and International Baccalaureate (IB) credit policies are detailed in the link below:

[Advance Placement \(AP\) and International Baccalaureate \(IB\) Examinations](#)

IMPORTANT TRANSFER INFORMATION

In addition to the Major Selection Criteria, all Upper-Division Transfer applicants must meet minimum [University of California admissions requirements](#). Visit <https://admissions.ucmerced.edu/transfer/requirements> for more specific UC Merced admissions information.

Prior to Transferring to UC Merced, please be advised of the following for Junior Transfers:

1) WRI 001 and WRI 010 are admissions requirements: In most situations, WRI 001 is fulfilled by IGETC 1A English Composition and WRI 010 is fulfilled by IGETC 1B Critical Thinking/English Composition. However best practice is to complete the articulated course for WRI 001 and WRI 010. Please scroll towards the bottom of the agreement to find the articulation for each course.

2) Transfer Admissions Guarantee (TAG): UC Merced is one of the six UC's that offers Transfer Admissions Guarantee. Please visit the TAG website for more information: <https://admissions.ucmerced.edu/transfer/tag>

3) General Education (GE Requirements): While general education is not required for admission, it can help speed up your time to graduation once you transfer to UC Merced. We highly recommend reviewing the [Transfer Students: Satisfying General Education](#) page in the catalog for a more extensive explanation of the requirements.

Please note the [School of Engineering](#) strongly discourages IGETC, but accepts it; students are encouraged to focus primarily on lower division major preparation and fulfilling UCM minimum admissions requirements. If you elect to complete IGETC, the courses may double count with the major courses listed below. Please visit your Community College Counselor to learn more.

4. This agreement displays all lower-division (or Major Preparation) courses required in the major. UC Merced courses on the left, approved (articulated) transfer courses to the right.

5. Changes to this Agreements: Major requirements are subject to change from one academic year to the next. Newly-articulated courses are added on a rolling basis, and articulated courses can be revised. Visit ASSIST every semester for the latest information and consult with an Academic Counselor at your institution on a regular basis.

For more questions about admissions, please email: transfer@ucmerced.edu.

ABOUT THIS MAJOR

[Bioengineering](#) is a discipline that applies engineering principles to design and analyze biological systems and to develop biomedical technologies. The bioengineering undergraduate major prepares students for employment in professions that require seamless application of engineering design and problem-solving to biological and biomedical systems. Bioengineers are in high demand in industries such as health care, pharmaceuticals, biotechnology, bioinstrumentation, food, and agriculture. The bioengineering undergraduate degree also provides a solid foundation for medical and graduate schools and for careers in allied fields of government and policy. Bioengineering has led to the development of biocompatible implants, functional prostheses, sensitive diagnostics, precision medicines, sustainable agriculture, scalable biomanufacturing, and tools that have accelerated the pace of research and development in biomedicine. Bioengineers thus contribute solutions to key challenges that effect human health and the well-being of society.

Visit the [22-23 catalog page](#) for the Lower Division and Upper Division requirements for the major.

MAJOR PREPARATION COURSES REQUIRED FOR TRANSFER

BIOE 002 - Molecular Biology for Engineers (4.00)

--- And ---

BIOE 002L - Molecular Biology for Engineers Laboratory (1.00)

- **REFER TO TOP OF AGREEMENT**



BIOL 6B - Cell and Molecular Biology (6.00)

- **REFER TO TOP OF AGREEMENT**
- *Course is an approved substitute for this major only*

--- And ---

CHEM 002 - General Chemistry I (4.00)



CHEM 1A - General Chemistry (5.00)

--- And ---

CHEM 1B - General Chemistry (5.00)

--- Or ---

CHEM 1A - General Chemistry (5.00)

--- And ---

CHEM 1BH - General Chemistry - HONORS (5.00)

--- Or ---

CHEM 1AH - General Chemistry - HONORS (5.00)

--- And ---

CHEM 1BH - General Chemistry - HONORS (5.00)

--- Or ---

CHEM 1AH - General Chemistry - HONORS (5.00)

--- And ---

CHEM 1B - General Chemistry (5.00)

CHEM 010 - General Chemistry II (4.00)

- ****REFER TO TOP OF AGREEMENT****



CHEM 1B - General Chemistry (5.00)

--- And ---

CHEM 1C - General Chemistry and Qualitative Analysis (5.00)

--- Or ---

CHEM 1BH - General Chemistry - HONORS (5.00)

--- And ---

CHEM 1CH - General Chemistry and Qualitative Analysis - HONORS (5.00)

--- And ---

MATH 021 - Calculus I for Physical Sciences & Engineering (4.00)



MATH 1A - Calculus (5.00)

--- And ---

MATH 1B - Calculus (5.00)

--- Or ---

MATH 1AH - Calculus - HONORS (5.00)

--- And ---

MATH 1BH - Calculus - HONORS (5.00)

MATH 022 - Calculus II for Physical Sciences & Engineering (4.00)



MATH 1B - Calculus (5.00)

--- And ---

MATH 1C - Calculus (5.00)

--- Or ---

MATH 1BH - Calculus - HONORS (5.00)

--- And ---

MATH 1CH - Calculus - HONORS (5.00)

MATH 023 - Vector Calculus (4.00)



MATH 1C - Calculus (5.00)

--- And ---

MATH 1D - Calculus (5.00)

--- Or ---

MATH 1CH - Calculus - HONORS (5.00)

--- And ---

MATH 1DH - Calculus - HONORS (5.00)

MATH 024 - Linear Algebra and Differential Equations (4.00)



MATH 2A - Differential Equations (5.00)

--- And ---

MATH 2B - Linear Algebra (5.00)

--- And ---

PHYS 008 - Introductory Physics I for Physical Sciences (3.00)

--- And ---

PHYS 008L - Introductory Physics I for Physical Sciences Lab (1.00)



PHYS 4A - Physics for Scientists and Engineers: Mechanics (6.00)

PHYS 009 - Introductory Physics II for Physical Sciences (3.00)

--- And ---

PHYS 009L - Introductory Physics II for Physical Sciences Lab (1.00)



PHYS 4B - Physics for Scientists and Engineers: Electricity and Magnetism (6.00)

--- And ---

PHYS 4C - Physics for Scientists and Engineers: Fluids, Waves, Optics and Thermodynamics (6.00)

BIOTECHNOLOGY EMPHASIS

Minimum grade required: C or better
Recommended to be completed prior to transfer

ENGR 065 - Circuit Theory (4.00)

← No Course Articulated

CHEM 008 - Principles of Organic Chemistry (3.00)

--- And ---

CHEM 008L - Principles of Organic Chemistry Lab (1.00)

←

CHEM 12A - Organic Chemistry (5.00)

--- And ---

CHEM 12B - Organic Chemistry (5.00)

ADDITIONAL LOWER DIVISION REQUIREMENT

Minimum grade required: C or better

BIOE 001 - Bioengineering Seminar (1.00)

← No Course Articulated

BIOE 021 - Introduction to Computing with Python (4.00)

← No Course Articulated

BIOE 045 - Introduction to Biomaterials (4.00)

← No Course Articulated

--- And ---

ENGR 030 - Introduction to Conservation Principles in Engineering (4.00)

← No Course Articulated

ENGR 080 - Statistical Modeling and Data Analysis for Engineers (4.00)

← No Course Articulated

TECHNICAL ELECTIVE

****REFER TO CATALOG****

Only lower division courses listed
Minimum grade required: C or better

BIO 003 - To Know Ourselves: Molecular Basis of Health and Disease (4.00)

← No Course Articulated

ACADEMIC WRITING - CHOOSE ONE COURSE FROM:

****REFER TO TOP OF AGREEMENT****
Minimum grade required: C or better

WRI 001 - Academic Writing (4.00)

←

ESL 5 - Advanced Composition and Reading (5.00)

--- Or ---

EWRT 1A - Composition and Reading (5.00)

--- Or ---

EWRT 1AH - Composition and Reading - HONORS (5.00)

--- Or ---

EWRT 1AS - Intensive Composition and Reading Stretch: First Quarter (5.00)

- UC credit limitation applies; refer to UC-transferability list

--- And ---

EWRT 1AT - Intensive Composition and Reading Stretch: Second Quarter (5.00)

- UC credit limitation applies; refer to UC-transferability list

COLLEGE READING AND COMPOSITION - CHOOSE ONE COURSE FROM:

****REFER TO TOP OF AGREEMENT****
Minimum grade required: C or better

WRI 010 - College Reading and Composition (4.00)



COMM 9 - Argumentation: Analysis of Oral and Written Communication (5.00)

--- Or ---

COMM 9H - Argumentation: Analysis of Oral and Written Communication - HONORS (5.00)

--- Or ---

EWRT 1B - Reading, Writing and Research (5.00)

--- Or ---

EWRT 1C - Literature and Composition (5.00)

--- Or ---

EWRT 2 - Critical Reading, Writing and Thinking (5.00)

--- Or ---

EWRT 2H - Critical Reading, Writing and Thinking - HONORS (5.00)

--- Or ---

PHIL 3 - Critical Thinking and Writing (5.00)

END OF AGREEMENT