

# Articulation Agreement by Major

Effective during the 2022-2023 Academic Year

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

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

## Chemistry, Lower Division B.A. and B.S.

### COLLEGE ADMISSION REQUIREMENTS

**The Bachelor of Arts (B.A.) Degree in Chemistry** is offered by the College of Letters and Science (L&S). The **B.A.** degree, which requires more humanities and social science courses than the B.S. degree, is intended for students interested in careers in teaching, medicine, or other sciences requiring a basic understanding of chemical processes.

You must complete:

- 1) The L&S Requirements in Reading & Composition, Foreign Language, Quantitative Reasoning; or
- 2) IGETC **by the end of the spring term that precedes fall enrollment at Berkeley.**

It is recommended that you complete as many major preparation courses as possible prior to transfer. As a transfer applicant you are expected to complete, at a minimum, coursework equivalent to Berkeley's:

CHEMISTRY 1A + 1AL + 1B + 3A + 3AL + 3B + 3BL  
MATH 1A + 1B + 53  
PHYSICS 7A

**The Bachelor of Science (B.S.) Degree in Chemistry** is offered by the College of Chemistry. The **B.S.** degree is intended for students who are primarily interested in careers as professional chemists or desire a thorough grounding in chemistry in preparation for professional or graduate school in chemistry and other disciplines. In addition, there are two concentrations available to Chemistry majors: 1) the Materials Chemistry concentration, intended for students interested in the application of basic chemical principles to the discovery, design, and characterization of materials; and 2) the Computational Chemistry concentration, intended for students interested in the use of high-performance computing, rooted in basic physical and mathematical principles, to solve problems in modern chemistry.

**Transfer applicants are expected to complete, at a minimum, coursework equivalent to Berkeley's:**

CHEMISTRY 1A + 1AL + 1B + 3A + 3AL + 3B + 3BL  
MATH 1A + 1B + 53  
PHYSICS 7A  
ENGLISH R1A + R1B

**Coursework must be completed by the end of the spring term preceding fall enrollment at Berkeley.**

IGETC is not required. Students who choose to complete the entire IGETC pattern by the end of the spring term preceding fall enrollment at Berkeley may use IGETC to fulfill the Reading and Composition and Language Other Than English (LOTE) Requirements.

Lower division courses required for graduation (but not for admission) are also listed in this articulation agreement. Completion of those courses is strongly recommended in order to strengthen one's application. All major courses must be taken for a letter grade. High grades in major courses (B and A grades exclusively) are essential for applicants to be both competitive in the admissions process and to be adequately prepared to continue with junior year coursework at Berkeley.

The applicant's personal insight questions are important in the admissions process. The answers are reviewed for evidence of the student's interest in the chosen field and a thoughtful match between the intended major and academic and career objectives.

**For more information on College of Chemistry policies and degree programs:**

<https://chemistry.berkeley.edu/ugrad/degrees>

**For more information on admission to UC Berkeley:**

<https://admissions.berkeley.edu>

**For more information on majors at UC Berkeley:**

**Berkeley Academic Guide:** <http://guide.berkeley.edu>

**Additional questions about transferring to the College of Chemistry may be addressed to:**

Maura Daly, Director of Undergraduate Student Services  
mdaly@berkeley.edu  
(510) 643-0550

### ADDITIONAL REQUIREMENTS

#### CHEMISTRY

Chemistry majors who transfer without having covered analytical chemistry are required to take CHEM 105 after transfer.

## ORGANIC CHEMISTRY

CHEM 12A + 12B (organic chemistry) are required for the Chemistry B.A. and B.S. degrees.

**Completion of CHEM 3A + 3AL + 3B + 3BL combined with a score in the 75th percentile or higher on the American Chemical Society (ACS) Organic Chemistry Exam will constitute satisfactory completion of Berkeley's CHEM 12A + 12B.** Students are encouraged to take the exam through their community college, if possible. **NOTE:** The College of Chemistry does not accept results from the 1994 and 1998 versions of the ACS Organic Chemistry Exam.

## MATHEMATICS

You may also satisfy this requirement with a score/grade of:  
3 or higher on the AP Calculus AB exam satisfies MATH 1A;  
3 or 4 on the AP Calculus BC exam satisfies MATH 1A;  
5 on the AP Calculus BC exam satisfies MATH 1A + 1B.

**PHYSICS 7C** is not required for the Chemistry major, but it is acceptable toward the 12-Unit Upper Division Chemistry and Allied Subjects Requirement for the Chemistry B.S. degree.

## BACHELOR OF SCIENCE (B.S.) DEGREE IN CHEMISTRY

Information on satisfying the Reading and Composition and Language Other Than English (LOTE) requirements for the Bachelor of Science (B.S.) Degree in Chemistry is listed below.

## READING AND COMPOSITION REQUIREMENT

Coursework equivalent to Berkeley's: English R1A + R1B; or

Entire IGETC pattern completed **by the end of the spring term preceding fall enrollment at Berkeley.**

**NOTE:** You may also satisfy this requirement with a score/grade of:  
4 or 5 on the AP exam in English Language and Composition satisfies ENGLISH R1A;  
4 on the AP exam in English Literature and Composition satisfies ENGLISH R1A;  
5 on the AP exam in English Literature and Composition satisfies ENGLISH R1A + R1B.

## LANGUAGE OTHER THAN ENGLISH (LOTE) REQUIREMENT

The Language Other Than English Requirement may be satisfied after transfer, but it should be satisfied by the end of the student's third (junior) year.

To satisfy this Requirement:

Complete a course equivalent to the third year of a language other than English in high school with a grade of C- or higher, or the second semester of a language other than English as taught at Berkeley; or

Complete the entire IGETC pattern by the end of the spring term preceding fall enrollment at Berkeley; **or**

You may satisfy this Requirement with a score/grade of:  
550 on the SAT Subject Test, Language Other Than English, if taken before May 1995;  
590 on the SAT II Subject Exam, if taken May 1995 or later;  
3 or better on the Foreign Language AP Exam;  
C or better on the GCE A-level or I/GCSE O-level Exam in a language other than English;  
1-5 on the Foreign Service Institute (FSI) or Defense Language Institute (DLI) exam;  
5 or better on the International Baccalaureate in the following exams:

Language (*other than English*) acquisition:

B Standard Level (SL)

B Higher Level (HL)

Studies in language (*other than English*) and literature:

A: literature Standard Level (SL)

A: literature Higher Level (HL)

A: language and literature Standard Level (SL)

A: language and literature Higher Level (HL)

## OR

Courses that satisfy the Language Other Than English (LOTE) requirement -- See list of approved (FL-Foreign Language) courses below.

(May be taken for a letter grade or pass/no pass).

## AP EXAM CREDIT

## MATHEMATICS

You may also satisfy this requirement with a score/grade of:  
3 or higher on the AP Calculus AB exam satisfies MATH 1A;  
3 or 4 on the AP Calculus BC exam satisfies MATH 1A;  
5 on the AP Calculus BC exam satisfies MATH 1A + 1B.

## LANGUAGE OTHER THAN ENGLISH (LOTE) REQUIREMENT

3 or better on the Foreign Language AP Exam

## READING AND COMPOSITION REQUIREMENT

You may also satisfy this requirement with a score/grade of:  
 4 or 5 on the AP exam in English Language and Composition satisfies ENGLISH R1A;  
 4 on the AP exam in English Literature and Composition satisfies ENGLISH R1A;  
 5 on the AP exam in English Literature and Composition satisfies ENGLISH R1A + R1B.

See [ADDITIONAL REQUIREMENTS](#) section for additional options to satisfy requirements.

## CHEMISTRY

**\*\*REFER TO TOP OF AGREEMENT\*\***

**CHEM 1A** - General Chemistry (3.00)

--- And ---

**CHEM 1AL** - General Chemistry Laboratory (2.00)

← Articulates as a Series Only

**CHEM 1B** - General Chemistry (4.00)

← Articulates as a Series Only

**CHEM 1A** - General Chemistry (3.00)

--- And ---

**CHEM 1AL** - General Chemistry Laboratory (2.00)

--- And ---

**CHEM 1B** - General Chemistry (4.00)

←

**CHEM 1A** - General Chemistry (5.00)

--- And ---

**CHEM 1B** - General Chemistry (5.00)

--- And ---

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

- *Regular and honors courses may be combined to complete this series*

--- Or ---

**CHEM 1AH** - General Chemistry - HONORS (5.00)

--- And ---

**CHEM 1BH** - General Chemistry - HONORS (5.00)

--- And ---

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

- *Regular and honors courses may be combined to complete this series*

## ORGANIC CHEMISTRY

**\*\*REFER TO TOP OF AGREEMENT\*\***

**CHEM 3A** - Chemical Structure and Reactivity (3.00)

--- And ---

**CHEM 3AL** - Organic Chemistry Laboratory (2.00)

←

**CHEM 12A** - Organic Chemistry (5.00)

--- And ---

**CHEM 12B** - Organic Chemistry (5.00)

**CHEM 3B** - Chemical Structure and Reactivity (3.00)

--- And ---

**CHEM 3BL** - Organic Chemistry Laboratory (2.00)

←

**CHEM 12B** - Organic Chemistry (5.00)

--- And ---

**CHEM 12C** - Organic Chemistry (5.00)

←

Articulates as Course-to-Course Only

**CHEM 3A** - Chemical Structure and Reactivity (3.00)

--- And ---

**CHEM 3AL** - Organic Chemistry Laboratory (2.00)

--- And ---

**CHEM 3B** - Chemical Structure and Reactivity (3.00)

--- And ---

**CHEM 3BL** - Organic Chemistry Laboratory (2.00)

## MATHEMATICS

**\*\*REFER TO TOP OF AGREEMENT\*\***

<b>MATH 1A</b> - Calculus (4.00)	<div>←</div> <div> <b>MATH 1A</b> - Calculus (5.00)           <div>--- And ---</div> <b>MATH 1B</b> - Calculus (5.00)           <ul style="list-style-type: none"> <li><i>Regular and honors courses may be combined to complete this series</i></li> </ul> </div> <div>--- Or ---</div> <div> <b>MATH 1AH</b> - Calculus - HONORS (5.00)           <div>--- And ---</div> <b>MATH 1BH</b> - Calculus - HONORS (5.00)           <ul style="list-style-type: none"> <li><i>Regular and honors courses may be combined to complete this series</i></li> </ul> </div>
<b>MATH 1B</b> - Calculus (4.00)	<div>←</div> <div> <b>MATH 1B</b> - Calculus (5.00)           <div>--- And ---</div> <b>MATH 1C</b> - Calculus (5.00)           <ul style="list-style-type: none"> <li><i>Regular and honors courses may be combined to complete this series</i></li> </ul> </div> <div>--- Or ---</div> <div> <b>MATH 1BH</b> - Calculus - HONORS (5.00)           <div>--- And ---</div> <b>MATH 1CH</b> - Calculus - HONORS (5.00)           <ul style="list-style-type: none"> <li><i>Regular and honors courses may be combined to complete this series</i></li> </ul> </div>
<b>MATH 53</b> - Multivariable Calculus (4.00)	<div>←</div> <div> <b>MATH 1C</b> - Calculus (5.00)           <div>--- And ---</div> <b>MATH 1D</b> - Calculus (5.00)           <ul style="list-style-type: none"> <li><i>Regular and honors courses may be combined to complete this series</i></li> </ul> </div> <div>--- Or ---</div> <div> <b>MATH 1CH</b> - Calculus - HONORS (5.00)           <div>--- And ---</div> <b>MATH 1DH</b> - Calculus - HONORS (5.00)           <ul style="list-style-type: none"> <li><i>Regular and honors courses may be combined to complete this series</i></li> </ul> </div>
<b>MATH 54</b> - Linear Algebra and Differential Equations (4.00)	<div>←</div> <div> <b>MATH 2A</b> - Differential Equations (5.00)           <div>--- And ---</div> <b>MATH 2B</b> - Linear Algebra (5.00)           <ul style="list-style-type: none"> <li><i>Regular and honors courses may be combined to complete this series</i></li> </ul> </div> <div>--- Or ---</div> <div> <b>MATH 2AH</b> - Differential Equations - HONORS (5.00)           <div>--- And ---</div> <b>MATH 2BH</b> - Linear Algebra - HONORS (5.00)           <ul style="list-style-type: none"> <li><i>Regular and honors courses may be combined to complete this series</i></li> </ul> </div>

PHYSICS	
**REFER TO TOP OF AGREEMENT**	
<b>PHYSICS 7A</b> - Physics for Scientists and Engineers (4.00)	<div>←</div> <b>PHYS 4A</b> - Physics for Scientists and Engineers: Mechanics (6.00)

**PHYSICS 7B** - Physics for Scientists and Engineers (4.00)



**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)

**PHYSICS 7C** - Physics for Scientists and Engineers (4.00)



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

--- And ---

**PHYS 4D** - Physics for Scientists and Engineers: Modern Physics (6.00)

**PHYSICS 7A** - Physics for Scientists and Engineers (4.00)

--- And ---

**PHYSICS 7B** - Physics for Scientists and Engineers (4.00)



Articulates as Course-to-Course Only

**PHYSICS 7A** - Physics for Scientists and Engineers (4.00)

--- And ---

**PHYSICS 7B** - Physics for Scientists and Engineers (4.00)

--- And ---

**PHYSICS 7C** - Physics for Scientists and Engineers (4.00)



Articulates as Course-to-Course Only

## READING AND COMPOSITION (R&C)

**\*\*REFER TO TOP OF AGREEMENT\*\***

**ENGLISH R1A** - Reading and Composition (4.00)



**EWRT 1A** - Composition and Reading (5.00)

--- Or ---

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

--- Or ---

**ESL 5** - Advanced Composition and Reading (5.00)

**ENGLISH R1B** - Reading and Composition (4.00)



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

--- Or ---

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

--- Or ---

**EWRT 1BH** - Reading, Writing and Research - HONORS (5.00)

--- Or ---

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

## LANGUAGE OTHER THAN ENGLISH

**\*\*REFER TO TOP OF AGREEMENT\*\***

FL-Foreign Language



**FREN 3** - Elementary French (Third Quarter) (5.00)

**GERM 3** - Elementary German (Third Quarter) (5.00)

**HNDI 3** - Elementary Hindi (Third Quarter) (5.00)

**ITAL 3** - Elementary Italian (Third Quarter) (5.00)

**JAPN 3** - Elementary Japanese (Third Quarter) (5.00)

**KORE 3** - Elementary Korean (Third Quarter) (5.00)

**MAND 3** - Elementary Mandarin (Third Quarter) (5.00)

**PERS 3** - Elementary Persian (Third Quarter) (5.00)

**SIGN 3** - Elementary American Sign Language (Third Quarter) (5.00)

**SPAN 3** - Elementary Spanish (Third Quarter) (5.00)

**VIET 3** - Elementary Vietnamese (Third Quarter) (5.00)

**END OF AGREEMENT**