

## PROGRAM OVERVIEW

A Chemistry degree can prepare you for a meaningful career in: developing renewable energy solutions for climate change; ensuring safe and pure air and drinking water; discovering materials for new devices using nanotechnology; analyzing medical samples to detect rare and dangerous diseases; contributing to Colorado's and America's mining and petroleum industries; and contributing to Colorado's emerging natural products and pharmaceuticals industries.

A BS in Chemistry also stands out as a premiere accomplishment in applications for professional degree programs, including pharmacy, medicine, nursing, dentistry, medical technology, and many others. Previous BS Chemistry graduates from CU-Denver have gone on to medical, dental, and pharmacy schools; to Ph.D. programs in chemistry and biomedical sciences; and to productive careers in the biotech, pharmaceutical, and medical technology industries.

## ACADEMIC ADVISING

The College of Liberal Arts and Sciences (CLAS) supports students to graduation using a shared advising system. CLAS students have two academic advisors with whom they should meet regularly to discuss academic and degree progress: a CLAS Academic Advisor and a major advisor.

*For questions related to CU Denver Core Curriculum, CLAS, general graduation requirements, university/college academic policies, or campus resources contact:*

### CLAS Academic Advising

[clas\\_advising@ucdenver.edu](mailto:clas_advising@ucdenver.edu)

Visit the CLAS Advising website [here](#)

North Classroom (NC) 1030

303-315-7100

*For questions related to major requirements, major course prerequisites, or evaluation of transfer coursework in your major contact:*

### Chemistry Major Advising

[CLAS Major Advisor Contact Information](#)

Visit the department website [here](#)

Science Building (SI) 3071

303-315-7650

## GENERAL GRADUATION REQUIREMENTS & POLICIES

*All CU Denver CLAS students are required to complete the following minimum general graduation requirements to be eligible to apply for graduation:*

1. Complete a minimum of 120 credit hours
2. Achieve a minimum 2.0 CU cumulative grade point average (GPA)
3. Complete a minimum of 45 upper-division (3000- to 4000-level) credit hours
4. Complete all CU Denver Core, CLAS, and major requirements
5. Complete a minimum of 30 CLAS credit hours with letter grades at CU Denver

*The following are **maximum** credit hours that can apply toward the minimum 120 hours required for graduation:*

- 16 credit hours Pass/Fail
- 12 credit hours of Independent Study/Directed Research
- 12 credit hours of internship credit
- 8 credit hours of physical education credit

## PROGRAM REQUIREMENTS & POLICIES

**Students are responsible for meeting with the major advisor to confirm major requirements.** Students completing the Chemistry B.S. Degree are required to complete the following minimum program requirements:

1. Students must complete a minimum of 66 credit hours, including a minimum of 44 CHEM credit hours.
2. Students must complete a minimum of 16 upper-division level (3000-level and above) CHEM credit hours.
3. Students must earn a minimum grade of C- (1.7) in all courses that apply to the major and must achieve a minimum cumulative major GPA of 2.0. All graded attempts in required and elective courses are calculated in the major GPA. Courses taken using P+/P/F or S/U grading cannot apply to major requirements. **Note: students completing the American Chemical Society (ACS) Certified degree must earn a minimum grade of C (2.0) in all major courses taken at CU Denver.**
4. Students must complete a minimum of 14 CHEM credit hours with CU Denver faculty, including CHEM 4128 Instrumental Analysis Laboratory, 4518 Physical Chemistry Laboratory: Reaction Analysis, or 4538 Physical Chemistry Laboratory: Molecular Structure.
5. A student who has declared a Chemistry major at CU Denver may not take additional chemistry courses outside of the Department for the purpose of applying those credits toward meeting the requirements of the major without prior written approval of the undergraduate Chemistry/Biochemistry advisor. No more than three additional hours of such pre-approved transfer credits will be allowed.
6. All courses applied to the chemistry major need to be taken within ten years of the graduation date with the exception of General Chemistry I and II Lecture and Lab: CHEM 2031 General Chemistry I, CHEM 2081 Honors General Chemistry I, CHEM 2038 General Chemistry Laboratory I; CHEM 2039 Majors General Chemistry I Laboratory, CHEM 2088 Honors General Chemistry Laboratory I, CHEM 2061 General Chemistry II, CHEM 2091 Honors General Chemistry II Lecture, CHEM 2068 General Chemistry Laboratory II, CHEM 2069 Majors General Chemistry II Laboratory, and CHEM 2098 Honors General Chemistry II Laboratory. In the event that the student would like to apply for expired credit for CHEM 3481 Majors Organic Chemistry I, the student will need to test at the 50th percentile on the ACS Standardized Exam for Organic Chemistry I.
7. PHYS 2321 Intro Experimental Physics Lab I and PHYS 2341 Intro Experimental Physics Lab II are specifically designed for students in non-Physics majors and can be paired with either PHYS 2010 College Physics I and PHYS 2020 College Physics II or PHYS 2311 General Physics I: Calculus-Based and PHYS 2331 General Physics II: Calculus-Based lectures. Students pursuing a second major in Physics should complete PHYS 2311 General Physics I: Calculus-Based and PHYS 2331 General Physics II: Calculus-Based and PHYS 2351 Applied Physics Lab I and PHYS 2361 Applied Physics Lab II.
8. Students may double major in Biochemistry and Chemistry. Students can apply the requirements for both majors if respective courses are a major requirement for both the Chemistry and Biochemistry major. A course cannot fulfill more than two requirement/elective areas in a student's degree.

## LYNXCONNECT RESOURCES

Are you interested in learning about internship, study abroad, career, and research opportunities for this major? Visit the CU Denver LynxConnect, located in Tivoli Student Union (TV) Suite 339, and browse the LynxConnect [website](#) for more information.

Degree Requirements	Credits	Notes
<b>* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information. *</b>		
<b>CU Denver Core Curriculum Requirements</b>	<b>34 - 40</b>	<a href="#">CU Denver Core Curriculum Requirements</a>
<b>CLAS Graduation Requirements</b>	<b>15 - 29</b>	<a href="#">CLAS Graduation Requirements</a>
<b>CHEM Major Requirements</b>	<b>66-72</b>	At least 16 CHEM credit hours must be upper-division
CHEM 2031 General Chemistry I <b>or</b> CHEM 2081 Honors General Chemistry I <sup>FA</sup>	3	*Prerequisite: Placement. If AP and IB credit for General Chemistry see Chemistry Advisor before registering for first chemistry class. See CHEM advisor for CHEM 2081.
CHEM 2039 Majors General Chemistry I Lab <b>or</b> CHEM 2038 General Chemistry I Lab <b>or</b> CHEM 2088 Honors General Chemistry I Lab <sup>FA</sup>	1-2	*Prerequisite/Corequisite: C- or higher in CHEM 2031 or 2081 See CHEM advisor for CHEM 2088.
CHEM 2061 General Chemistry II <b>or</b> CHEM 2091 Honors General Chemistry II <sup>SP</sup>	3	*Prerequisite: C- or higher in CHEM 2031 or 2081. See CHEM advisor for CHEM 2091.
CHEM 2069 Majors General Chemistry II Labor <b>or</b> CHEM 2068 General Chemistry II Lab <b>or</b> CHEM 2098 Honors General Chemistry II Lab <sup>SP</sup>	2	* Prerequisite: C- or higher in CHEM 2038 or 2088. *Prerequisite/Corequisite: CHEM 2061 or CHEM 2091 See CHEM advisor for CHEM 2098.
CHEM 3011 Inorganic Chemistry <sup>SP</sup>	3	*Prerequisite/Corequisite: C- or higher in CHEM 3421 or CHEM 3491
CHEM 3018 Inorganic Chemistry Lab	2	*Prerequisite/Corequisite: C- or higher in CHEM 3011
CHEM 3111 Analytical Chemistry <sup>FA</sup>	3	*Prerequisite: C- or higher in CHEM 2061 or 2091
CHEM 3118 Analytical Chemistry Lab <sup>FA</sup>	2	*Prerequisite: C- or higher in CHEM 2068 or 2098 *Prerequisite/Corequisite: CHEM 3111 or 3481
CHEM 3481 Majors Organic Chemistry I <sup>FA</sup> For CHEM-BS or BICM-BS students only	4	*Prerequisite: C- or higher in CHEM 2061 or 2091. *Corequisite: CHEM 3418 or 3488
CHEM 3488 Majors Organic Chemistry I Lab <sup>FA</sup> For CHEM-BS or BICM-BS students only	1	*Prerequisite: C- or higher in CHEM 2068, 2069 or 2098. *Prerequisite/Corequisite: CHEM 3411 or 3481
CHEM 3491 Majors Organic Chemistry II <sup>SP</sup> For CHEM-BS or BICM-BS students only	4	*Prerequisite: C- or higher in CHEM 3411 or 3481
CHEM 3498 Majors Organic Chemistry II Lab <sup>FA, SP</sup> For CHEM-BS or BICM-BS students only	2	*Prerequisite: C- or higher in CHEM 3411 or 3481 and 3418 or 3488
CHEM 4121 Instrumental Analysis <sup>SP</sup>	3	*Prerequisite: C- or higher in CHEM 3111 or CHEM 3481, 3421 or 3491, CHEM 4521 and PHYS 2331 or 2020
CHEM 4128 Instrumental Analysis Lab <sup>SP</sup>	2	*Prerequisite: C- or higher in CHEM 3118 and 4538 *Corequisite: CHEM 4121
CHEM 4500 Foundations of Physical Chemistry <sup>FA</sup>	3	*Prerequisite: C- or higher in PHYS 2020 and MATH 2411 *Prerequisite/Corequisite: C- or higher in PHYS 2331 and CHEM 3421 or 3491
CHEM 4511 Physical Chemistry: Thermodynamics and Kinetics <sup>SP</sup>	3	*Prerequisite: C- or higher in PHYS 2331 or 2020 and either: *Prerequisite: C- or higher in MATH 2421 or CHEM 4500 or *Corequisite/Prerequisite: C- or higher in MATH 3511
CHEM 4518 Physical Chemistry Lab: Reaction Analysis <sup>SP</sup>	2	*Prerequisite/Corequisite: CHEM 4511
CHEM 4521 Physical Chemistry: Quantum Mechanics & Spectroscopy <sup>FA</sup>	3	*Prerequisite: C- or higher in PHYS 2331 or 2020 and either: *Prerequisite: C- or higher in MATH 2421 or CHEM 4500 or *Corequisite/Prerequisite: C- or higher in MATH 3511
CHEM 4538 Physical Chemistry Lab: Molecular Structure <sup>FA</sup>	2	*Prerequisite/Corequisite: C- or higher in CHEM 4511 or 4521
<b>Ancillary (Supporting Math and Science) Courses:</b>		
PHYS 2311 & 2321 General Physics I & Intro to Experimental Phys Lab I <i>and</i> PHYS 2331 & 2341 General Physics II & Intro Experimental Phys Lab II <b>or</b> PHYS 2010 & 2321 College Physics I & Intro to Experimental Phys Lab I <i>and</i> PHYS 2020 & 2341 College Physics II & Intro to Experimental Phys Lab II	10	*Prerequisite: MATH 1401 for PHYS 2311 *Prerequisite: C- or higher in PHYS 2311 and MATH 2411 (for 2331) and PHYS 2321 (for PHYS 2341) *Prerequisite: C- or higher in PHYS 2010 or 2311 (for 2020) *Prerequisite: C- or higher in PHYS 2030 or 2321 (for 2341)
MATH 1401 Calculus I	4	*Prerequisite: C- or higher in MATH 1109, 1070, or 1110 and MATH 1120; or C- or higher in MATH 1130; or C- or higher in MATH 1401; or entry into the MA01 Student Group OR ALEKS PPL score 76-100.
MATH 2411 Calculus II	4	*Prerequisite: C- or higher in MATH 1401
<b>Optional American Chemistry Society (ACS) Certified Degree Requirements:</b>		
CHEM 3810 Biochemistry <b>or</b> CHEM 4810 General Biochemistry I <sup>SP</sup>	3 - 4	*Prerequisite (for 3810): C- or higher in BIOL 2020 or 2030 and CHEM 3411 or 3481 *Prerequisite/Corequisite (for 4810): C- or higher in CHEM 3421 or 3491
Upper-Division Lecture Elective – See CHEM Advisor	3	*Check individual courses for prerequisites.
<b>Estimated General Electives</b>	<b>0 - 5</b>	General Elective credits vary based on Core & CLAS Requirements. Consult with CLAS Advisor.
<b>Total Minimum Credit Hours:</b>	<b>120</b>	45 credit hours must be upper-division

## SUGGESTED ACADEMIC PLAN OF STUDY

The following academic plan is a *suggested* pathway to completing degree requirements for this major. Students should tailor this plan based on previously completed college coursework (e.g., AP, IB, CLEP, dual/concurrent enrollment, and transfer credit) and individual preferences related to course load, schedules, or add-on programs such as minors or double-majors.

**Note:** Students should be aware that certain graduate programs do not accept AP, IB and CLEP credits. Students must have a plan on file with the Chemistry Major Advisor. **Additionally, the sample plan below includes the calculus-based physics option, which is the recommended option for students. Students can choose to complete the algebra-based physics option, but must meet with the CHEM advisor to amend this sample plan.**

Year One	<b>Fall</b>	CRS	Year One	<b>Spring</b>	CRS
	ENGL 1020 – Core Composition I	3		ENGL 2030 – Core Composition II	3
	CHEM 2031 & 2038/2039 <sup>C</sup> or CHEM 2081 & 2088	4		CHEM 2061 & 2068/2069 <sup>C</sup> or CHEM 2091 & 2098 <sup>PE</sup>	5
	MATH 1401 <sup>PE C</sup>	4		MATH 2411 <sup>C</sup>	4
	CU Denver Core Behavioral Science / First-Year Seminar	3		CU Denver Core Humanities	3
	<b>Total Credit Hours</b>	<b>14</b>		<b>Total Credit Hours</b>	<b>15</b>
Year Two	<b>Fall</b>	CRS	Year Two	<b>Spring</b>	CRS
	CHEM 3481 & 3488 <sup>PE</sup>	5		CHEM 3491 <sup>PE</sup>	4
	PHYS 2311 & 2321 <sup>PE C</sup>	5		CHEM 3498	2
	CHEM 3111 <sup>PE</sup> & 3118 <sup>PE</sup>	5		PHYS 2331 & 2341 <sup>PE C</sup>	5
				CLAS Communicative Skills	3
	<b>Total Credit Hours</b>	<b>15</b>		<b>Total Credit Hours</b>	<b>14</b>
Year Three	<b>Fall</b>	CRS	Year Three	<b>Spring</b>	CRS
	CHEM 4521 & 4538 <sup>PE</sup>	5		CHEM 4511 & 4518 <sup>PE</sup>	5
	CHEM 4500 <sup>PE</sup>	3		CU Denver Core Arts	3
	CLAS Second Language Semester I	5		CLAS Second Language Semester II	5
	CLAS Behavioral Science	3		CU Denver Core International Perspectives	3
	<b>Total Credit Hours</b>	<b>16</b>		<b>Total Credit Hours</b>	<b>16</b>
Year Four	<b>Fall</b>	CRS	Year Four	<b>Spring</b>	CRS
	CHEM 3810 <sup>PE</sup> or CHEM 4810 <sup>PE</sup> (see major advisor)	3-4		CHEM 3011 & 3018 <sup>PE</sup>	5
	CU Denver Core Social Science	3		CHEM 4121 & 4128 <sup>PE</sup>	5
	CU Denver Core Cultural Diversity	3		CLAS Social Science	3
	CLAS Humanities	3		Upper-Division General Elective	3
	Upper-Division General Elective	3		General Elective	0-2
	<b>Total Credit Hours</b>	<b>15-16</b>		<b>Total Credit Hours</b>	<b>16-18</b>

<sup>M</sup> Major Course Available   <sup>C</sup> CU Denver Core Course   <sup>PE</sup> Prerequisite Enforced   <sup>PR</sup> Prerequisite Recommended