CHEMISTRY: 7-12 TEACHER PREPARATION CONCENTRATION, BACHELOR OF SCIENCE

The major in Chemistry leads to a Bachelor of Science (BS) degree. The secondary teaching certification emphasis provides a solid foundation in the major core areas of chemistry, as well as training in the teaching of chemistry in high school.

Program Goals

- To prepare graduates in the discipline of chemistry to become productive members of the profession whether they go on to industry, post-graduate education or other areas.
- To prepare students in the verbal, written and quantitative skills that are prerequisites to advanced study or careers in chemistry.
- To prepare students in the theoretical principals of chemistry as well as in the laboratory approach to problem solving.
- To maintain approval of the chemistry curriculum as defined by the American Chemical Society, Committee on Professional Training.
- To provide the opportunity for a variety of educational programs through the following:
  a. Basic Chemistry
  b. ACS Certified Curriculum
  c. Biochemistry
  d. Environmental Chemistry
  e. Chemistry/Teacher Certification
  f. Double Major
  g. Chemistry Minor

Expected Student Outcomes

Chemistry graduates are expected to:

- Understand the concept of and be able to apply the scientific method to problem solution;
- Understand classifications of chemical compounds, general reaction types and quantitative aspects of stoichiometry as applied to chemical reactions;
- Apply basic knowledge of related fields such as mathematics and physics to problem solving, methods of analysis and use of numerical data in the chemical sciences;
- Demonstrate a knowledge of basic laboratory skills, methods and equipment used in chemistry for observation and analysis of chemical systems;
- Read, think and write critically and review current literature in the chemical sciences; and
- Exhibit a comprehensive knowledge of the fundamental theories, concepts and skills necessary in the chemical sciences.

Outcomes Assessment Activities

- Assessment of chemistry majors occurs through examination of GPA in required courses. Majors are required to maintain a 2.000 GPA in major and minor courses as well as in other required courses.
- Students are required to complete American Chemical Society national standard exams when given during the course of the chemistry degree curriculum. Scores are compared to national averages to determine if students exhibit a comprehensive knowledge of the fundamental theories and concepts necessary in the chemical sciences disciplinary areas.
- Students are required to take an exit examination during the senior year. The ETS Major Field Achievement Test (MFAT) covers the undergraduate chemistry curriculum. Scores are compared to national averages to determine if students exhibit a comprehensive knowledge of the fundamental theories and concepts necessary in the chemical sciences overall.

Specific Program Requirements

- Students majoring or minoring in chemistry are required to have a cumulative GPA of 2.000 or better in their chemistry courses. In addition, students majoring or minoring in chemistry must receive a grade of "C" or better in all core chemistry courses. Students minoring in chemistry are required to earn a grade of "C" or better in all of the chemistry courses applying to the minor.
- Proficiency in physics, math and computer science is essential for understanding and applying chemical principles; therefore, graduates must complete approved math and physics courses with an overall GPA of 2.000 or better.
- Transfer students are required to earn a minimum of 20 semester credit hours in approved chemistry courses from CSU Pueblo for graduation with a BS degree in chemistry. Transfer students wishing to minor in chemistry must earn a minimum of 10 of the 20 credit hours required at CSU Pueblo.
- Students will be required to take an exit examination during the senior year, covering the undergraduate chemistry curriculum.

Specific Core Requirements

Course	Title	Credits
CHEM 121 & 121L	General Chemistry I (GT-SC2) and General Chemistry Lab I (GT-SC1)	5
CHEM 122 & 122L	General Chemistry II (GT-SC2) and General Chemistry Lab II (GT-SC1)	5
CHEM 170	Academic Orientation	0.5
CHEM 301 & 301L	Organic Chemistry I and Organic Chemistry Lab I	5
CHEM 302 & 302L	Organic Chemistry II and Organic Chemistry Lab II	5
CHEM 317 & 317L	Quantitative Analysis and Quantitative Analysis Lab	5
CHEM 321	Physical Chemistry I	3
CHEM 322	Physical Chemistry II	3
CHEM 370	Academic Enrichment	0.5
CHEM 419 & 419L	Instrumental Analysis and Instrumental Analysis Lab	5
CHEM 420 & 420L	Inorganic Chemistry and Inorganic Chemistry Lab	4
CHEM 493	Seminar	1
Total Credits		**42**

Specific Concentration Requirements

Course	Title	Credits
BIOL 100 & 100L	Principles of Biology (GT-SC2) and Principles of Biology Lab (GT-SC1)	4
BIOL 121 & 121L	Environmental Conservation (GT-SC2) and Environmental Conservation Lab (GT-SC1)	4
ED 444	Teaching Secondary Science	4
GEOL 101 & 101L	Earth Science (GT-SC2) and Earth Science Lab (GT-SC1)	4
MATH 126	Calculus & Analytic Geometry I (GT-MA1)	5
MATH 224	Calculus and Analytic Geometry II	5
PHYS 221 & 221L	General Physics I and General Physics I Lab (GT-SC1)	5
PHYS 222 & 222L	General Physics II and General Physics II Lab (GT-SC1)	5
Total Credits		**36**

Specific Requirements for the Secondary and K-12 Teaching Endorsements/Minor

The student must complete an appropriate major and the following Education courses:

Course	Title	Credits
Select one of the following:		3
PSYC 151	Human Development (GT-SS3)	3
PSYC 251	Childhood and Adolescence	3
PSYC 342	Educational Psychology	3
ED 202	Foundations of Education	3
ED 280	Educational Media and Technology [2]	3
ED 301	Frameworks of Teaching (Admission to Education is completed in this course)	4
RDG 435	Disciplinary Literacy [3, 5]	4
Special Methods in Endorsement Areas (Prerequisites - Admission to Education) [5]		4
ED 412	Teaching Diverse Learners [4, 5]	3
ED 485	Capstone Seminar in Education	1
ED 488 or ED 489	Student Teaching Secondary Student Teaching K-12	12
Total Credits [3]		37-40

1. Music students may take PSYC 151 Human Development (GT-SS3) (3 c.h.)or PSYC 251 Childhood and Adolescence (3 c.h.).
2. Music Education students may complete MUS 103 Music and Computer Technology I (1 c.h.) and MUS 306 Technology for Music Educators (2 c.h.) for ED 280 Educational Media and Technology (3 c.h.).
3. English/Language Arts student must also complete RDG 410 Teaching Reading (3 c.h.)
4. Physical Education students may complete EPER 465 Adapted Physical Education (3 c.h.) or ED 412 Teaching Diverse Learners (3 c.h.).
5. GPA of 2.6 required

Planning Sheet

Disclaimer: The Planning Sheet is designed as a guide for student's planning their course selections. The information on this page provides only a suggested schedule. Actual course selections should be made with the advice and consent of an academic advisor. While accurately portraying the information contained in the college catalog, this form is not considered a legal substitute for that document. Students should become familiar with the catalog in effect at the time in which they entered the institution.

Enrollment in CHEM 121 requires successful placement exam score or completion of CHEM 111 with a grade of C or better, and completion of MATH 120 with a grade of C or better, or mathematics placement above MATH 120. The placement exam is administered through the Testing Center - contact them to make arrangements.

*CID 103 is required for admission into the Teacher Education Program.

Course	Title	Credits
Year 1		
Fall		
CHEM 121 & 121L	General Chemistry I (GT-SC2) and General Chemistry Lab I (GT-SC1)	5
CHEM 170	Academic Orientation	0.5
ENG 101	Rhetoric & Writing I (GT-CO1)	3
CID 103	Speaking & Listening	3
PSYC 151 or PSYC 251 or PSYC 342	Human Development (GT-SS3) or Childhood and Adolescence or Educational Psychology	3
	Credits	**14.5**
Spring		
BIOL 100 & 100L	Principles of Biology (GT-SC2) and Principles of Biology Lab (GT-SC1)	4
CHEM 122 & 122L	General Chemistry II (GT-SC2) and General Chemistry Lab II (GT-SC1)	5
ENG 102 or ENG 117	Rhetoric & Writing II (GT-CO2) or Intro. Scientific/Medical Writing (GT-CO2)	3
General Education		3
	Credits	**15**
Year 2		
Fall		
BIOL 121 & 121L	Environmental Conservation (GT-SC2) and Environmental Conservation Lab (GT-SC1)	4
ED 280	Educational Media and Technology	3
MATH 126	Calculus & Analytic Geometry I (GT-MA1)	5
General Education	recommended to select a History course	3
	Credits	**15**
Spring		
CHEM 301	Organic Chemistry I	3
CHEM 301L	Organic Chemistry Lab I	2
MATH 224	Calculus and Analytic Geometry II	5
ED 202	Foundations of Education	3
GEOL 101 & 101L	Earth Science (GT-SC2) and Earth Science Lab (GT-SC1)	4
	Credits	**17**
Year 3		
Fall		
CHEM 311	Biochemistry Survey	3
CHEM 317 & 317L	Quantitative Analysis and Quantitative Analysis Lab	5
ED 301	Frameworks of Teaching	4
RDG 435	Disciplinary Literacy	4
	Credits	**16**

Spring		
CHEM 420 or CHEM 419	Inorganic Chemistry CHEM 420 is fall-only course - see your advisor or Instrumental Analysis	3
CHEM 420L or CHEM 419L	Inorganic Chemistry Lab CHEM 420 is fall-only course - see your advisor or Instrumental Analysis Lab	1-2
ED 412	Teaching Diverse Learners	3
PHYS 221 & 221L	General Physics I and General Physics I Lab (GT-SC1)	5
General Education	recommended to select a Humanities course	3
	Credits	**15-16**
Year 4		
Fall		
CHEM 322	Physical Chemistry II	3
CHEM 493	Seminar	1
ED 444	Teaching Secondary Science	4
PHYS 222 & 222L	General Physics II and General Physics II Lab (GT-SC1)	5
General Education	recommended to select a Humanities course	3
	Credits	**16**
Spring		
ED 485	Capstone Seminar in Education	1
ED 488	Student Teaching Secondary	12
	Credits	**13**
	Total Credits	**121.5-122.5**