CHEMISTRY, MASTER OF SCIENCE

In addition to a minimum undergraduate GPA of 3.000 admission into the Chemistry (MS) program requires a minimum score of 300 on the GRE and submission of three letters of recommendation.

The graduate program leading to the degree of Master of Science in Chemistry prepares students to apply fundamental chemistry principles to more advanced questions encountered in industry, government, business, and education. Graduates from this program will be able to apply techniques of scientific research in the chemical sciences to real-world problems.

Course work may include several important areas in the chemical and natural sciences, including advanced instrumental techniques, and environmental concerns. This program also offers a 3+2 plan described elsewhere, which allows students to simultaneously complete requirements for a BS and MS degree in five years.

The Master of Science in Chemistry requires 30 or 32 semester credit hours of approved graduate course work in either the thesis or non-thesis (internship) option, respectively.

Specific Admission Requirements

Admission to the Chemistry MS program is in accordance with Colorado State University Pueblo and the Department of Chemistry requirements for master's programs as specified in the University's Catalog. The application file for admission to the Chemistry MS program must include:

1. A completed Chemistry MS application form;
2. A personal statement;
3. A CSU-Pueblo transcript documenting an undergraduate GPA of 3.000 or higher;
4. Three letters of recommendation from CSU-Pueblo faculty; and
5. Combined GRE scores above 300 (students may be admitted into the Chemistry MS program before taking the GRE; however, they must submit satisfactory GRE scores by the last day of finals at the end of their first semester in the Chemistry MS program to remain in the program).

Expected Student Learning Outcomes

Upon completion of the Chemistry MS or BS/MS, students will:

- Be able to understand and evaluate the scientific literature and use it in their courses and their research.
- Be able to effectively communicate scientific research, both their own and information from the research literature, in written and oral fashions.
- Develop and master the scientific problem solving skills required to define and solve basic or applied original scientific questions using the scientific method.
- Actively engage in research/internships and discourse with the faculty in the Chemistry Department and other STEM disciplines.
- Disseminate, in collaboration with faculty, the products of the Chemistry-MS program within the CSU Pueblo community and with communities outside of the University in activities using their professional expertise.

Outcomes Assessment Activities

The faculty will use a variety of methods for evaluating student learning outcomes. These include required student enrollment in CHEM 510 Foundations in Graduate Studies (3 c.h.), which involves faculty directed instruction and practice in searching, evaluating, and discussing scientific literature, instruction in experimental design, and dissemination of scientific research results. Students completing this degree program will give a public research seminar (CHEM 593 Seminar (1 c.h.)) that will be evaluated by cognizant faculty members. A written research thesis or internship report will be publically presented and defended by students to demonstrate proficiency in their area of study and these will be evaluated by the student's Graduate Advisory Committee. Students will collaborate with faculty to present the results of their thesis research or internship project within the greater Southern Colorado region, give seminars/posters on campus or at appropriate scientific meetings, publish the results of their research in peer reviewed scientific journals, or disseminate information through other appropriate media.

Specific Program Requirements

The course of study requires four semester credits of course work common to all students. Each student must complete three of the five core courses (9 credit hours). Students are required to complete 10-12 additional credit hours of approved graduate level electives in Chemistry, Biology, Math, or Engineering as outlined in the graduation plan developed with the student's advisor and graduate committee, and approved by the Program Director. The signed graduation plan may be completed at any time, but is a requirement for successful completion of CHEM 510.

Thesis option students are required to defend their research results before their graduate committee. Non-thesis option students must take a written comprehensive examination over courses taken in their program of study. A non-thesis option student must submit a formal written report based on an internship and defend their internship and work before their graduate committee.

Each student must pass qualifying exams in three of five areas of selected chemistry content (analytical, biological, inorganic, organic, or physical chemistry). Students will have two opportunities to pass each area exam. Qualifier examinations are scheduled during the week preceding the beginning of classes each term or in consultation with the program director or department chair. If an examination is failed, the requirement may be satisfied by completing the designated undergraduate coursework in the appropriate subdiscipline, as specified by the program director or department chair, with a minimum grade of "B". Students enrolling into the 3+2 program will be exempt from the requirement to pass qualifying exams if they have completed courses at CSU Pueblo in analytical, biological, inorganic, organic, or physical chemistry with a grade of "B" or better. Students enrolled in the 3+2 program required to pass qualifying exams will schedule the exams in consultation with the Program Director.

Chemistry program requirements are summarized as follows:

Required Core Courses

Course	Title	Credits
Select three of the following:		9
CHEM 501	Advanced Organic Chemistry	3
CHEM 511	Biochemistry I	3
or CHEM 512	Biochemistry II	

CHEM 521	Advanced Inorganic Chemistry	3
CHEM 529	Advanced Analytical Chemistry	3
CHEM 531	Advanced Physical Chemistry	3
Total Credits		**9**

Plan A (Thesis Option)

Course	Title	Credits
Required Core Courses		
Core Courses		9
Thesis Option Courses		
CHEM 510	Foundations in Graduate Studies	3
CHEM 589	Thesis Defense	1
CHEM 593	Seminar	1
CHEM 599	Thesis Research [1]	6
Elective Courses		
Select 10 credits		10
Total Credits		**30**

[1] Students may only enroll for a total of 6 credit hours of CHEM 599 Thesis Research (1-6 c.h.).

Plan B (Non-Thesis Option)

Course	Title	Credits
Required Core Courses		
Core Courses		9
Non-Thesis Option Courses		
CHEM 510	Foundations in Graduate Studies	3
CHEM 588	Internship Defense	1
CHEM 593	Seminar	1
CHEM 598	Internship	4
Elective Courses		
Select 14 credits		14
Total Credits		**32**

Electives

Elective courses may be selected from the following chemistry courses or others may be added with permission of the graduate committee.

Course	Title	Credits
CHEM 501 & 501L	Advanced Organic Chemistry and Advanced Organic Chemistry Lab	5
CHEM 503	Polymer Chemistry	3
CHEM 511	Biochemistry I	3
CHEM 512 & 512L	Biochemistry II and Biochemistry II Lab	5
CHEM 519 & 519L	Instrumental Analysis and Instrumental Analysis Lab	5
CHEM 521	Advanced Inorganic Chemistry	3
CHEM 525	Environmental Chemistry	3
CHEM 529	Advanced Analytical Chemistry	3
CHEM 531	Advanced Physical Chemistry	3
CHEM 550	Industrial Chemistry	2
CHEM 591	Special Topics	1-4
CHEM 592	Research	1-3
CHEM 595	Independent Study	1-4