

## DEPARTMENT OF CHEMISTRY

The study of Chemistry, the science of matter and the changes it undergoes, is central to any understanding of the universe in which we live. A major in Chemistry combined with the core curriculum provides a superb liberal and professional education.

The department offers six degree programs leading to the Bachelor of Science degree. These are the Chemistry (A.C.S. Certified) program, the Chemistry track, the Chemistry (Preprofessional) program, the Chemistry (Prepharmacy) program, the Biochemistry program, and the Science Education (Chemistry) program. All of these programs provide the basic grounding in physical, organic, inorganic, analytical, and biochemistry necessary for any overall understanding of the subject. Additional advanced courses and courses in related subjects such as mathematics, physics, and biology are required as needed for the student's desired specialty.

The Chemistry (A.C.S. Certified) program is approved by the American Chemical Society. With its required minor in Mathematics, students are prepared for graduate studies in Chemistry and for careers as professional chemists.

The Chemistry program is a more flexible program. Unlike the other Chemistry programs, it does not require the student to minor in a specific area. Rather, students must choose their own minor which must include at least 18 semester hours. The student also must follow the requirements of the University and the Department in which they wish to minor. This program also allows for more free electives than other Chemistry programs. This program is designed to allow a student the option to design a program to fit career and life goals that combine chemistry with other subjects. It is especially relevant for students with nontraditional goals and those transferring from another major who have already accumulated significant hours in another field. Students with career goals aligned with the Department's other programs usually are best served following those programs. It is very important for students following the Chemistry program to plan the program in close consultation with their academic advisor.

The objective of the Chemistry (Preprofessional) program is to prepare students for success in medical, dental, and related health professional schools. The courses in the major and its required Biology minor have been carefully chosen to give the graduates of this program the greatest chance of success in their chosen professional field. Students following this course of study have the option of choosing an accelerated program if they seek early admission to professional school. Courses taken in the first year of professional school substitute for courses ordinarily taken in the senior year.

The Chemistry (Prepharmacy) program is designed to prepare students for success in pharmacy school. Students wishing to pursue a Doctor of Pharmacy (PharmD) degree through Xavier's College of Pharmacy must complete 66 credit hours of the Chemistry (Prepharmacy) curriculum, as specified, prior to being admitted to the PharmD program. Students interested in pursuing a Doctor of Pharmacy degree at another institution are also advised to follow the Chemistry (Prepharmacy) curriculum while at Xavier. For those students following this course of study who may opt to not pursue an advanced degree in Pharmacy, the four-year curriculum provides preparation for other careers or advanced study requiring significant background in Chemistry. Students choosing to complete the full four-year program should work closely with their academic advisor in choosing elective courses.

The Biochemistry program prepares students for graduate study and careers in this fast-moving and exciting area of science. This program requires a double concentration in Mathematics and Biology.

The department also offers a program in Science Education – Chemistry jointly with the Division of Education. The objective of this program is to provide students with the proper combination of chemistry and education courses to prepare them to teach chemistry at the high school level.

In all of its courses of study, the goal of the Chemistry Department is to provide its students with knowledge of basic ideas in the field, so that they may be able to provide explanations, interpret data, and solve problems by applying these concepts. The department also provides practice in the use of the tools of research and the scientific method in chemistry, so that students can explore and organize topics, solve problems and perform investigations, and present their findings using acceptable scientific formats.

The department requires a grade of "C" or better in each chemistry course required for a degree with a major in chemistry. Also, majors are required to complete a capstone experience as part of a senior comprehensive exam during their senior year.

**Admitting Students Changing Majors/Readmitted Students** -- A student having a cumulative and Chemistry GPA of 2.5 or above will be admitted into the department by the chairperson. A student having a cumulative and Chemistry GPA of 2.0 or below will not be considered for admission into the department. Any students with GPA's not in the categories listed above will have their records reviewed by the Department's Academic Standing Committee. Admission into the department for these students will require a majority vote of the committee.

**Honors in Chemistry** -- Students majoring in Chemistry qualify for the distinction "Honors in Chemistry" by completing their course of study with a 3.5 overall cumulative average and a 3.5 cumulative average in chemistry. Students minoring in chemistry must have a 3.5 overall average and a 3.7 average in their chemistry courses to earn this distinction. At least 18 hours of chemistry credits must be earned at Xavier.

**Minor in Chemistry** -- Students in other majors who wish to minor in Chemistry must complete General Chemistry (CHEM 1010/1010D/1011L and CHEM 1020/1020D/1021L), Organic Chemistry (CHEM 2210/2210D/2230L and CHEM 2220/2220D/2240L), and at least two additional semester hours of Chemistry courses at the 3000 level or higher.

## PROGRAM IN CHEMISTRY (A.C.S. Certified)

### FRESHMAN YEAR

	Semester Hours		
	1 <sup>st</sup>	2 <sup>nd</sup>	
	Semester	Semester	
Chemistry 1010/1010D/1011L - 1020/1020D/1021L	4	4	General Chemistry I – II
English 1010-1020	3	3	Comp & Rhetoric/Comp & Lit.
Foreign Language	3	3	Core Requirement
Mathematics 1030-1070	4	4	Precalculus/Calculus I
Speech Communication 1010	3		Fundamentals of Public Speaking
Free elective		3	
	17	17	

**SOPHOMORE YEAR**

Chemistry 2210/2210D/2230L - 2220/2220D/2240L	4	4	Organic Chemistry I – II
African American Studies		3	Core Requirement
Mathematics 2030		3	Linear Algebra
Mathematics 2070-2080	4	4	Calculus II – III
Physical Education	1		Activity Course or Test
Physics 2010/2010L - 2020/2020L	4	4	General Physics I – II
Social Sciences	3		Core Requirement
	<u>16</u>	<u>18</u>	

**JUNIOR YEAR**

Chemistry 3030/3030L		4	Physical Chemistry I and Lab
Chemistry 3210/3210L	4		Quantitative Analysis and Lab
Chemistry 4080		0	Introduction to Research
Chemistry 4130		3	Introduction to Biochemistry
Mathematics 2530	3		Differential Equations
English 2010	3		World Literature I
History 1030-1040	3	3	World Civilizations
Philosophy		3	Core Requirement
Theology	3		Core Requirement
Free Elective(s)		2	
	<u>16</u>	<u>15</u>	

**SENIOR YEAR**

Chemistry 3040	3		Physical Chemistry II
Chemistry 3040L	1		Adv. Physical Chemistry Lab
Chemistry 4010-4011	3	3	Advanced Inorganic Chem. I - II
Chemistry 4310L		2	Advanced Synthesis Lab
Chemistry 4240/4240L	4		Instrumental Analysis and Lab
Chemistry 4083	3		Undergraduate Research
Chemistry 4999	0		Senior Comprehensives
Chemistry Elective		3	
Fine Arts		3	Core Requirement
Philosophy 3250		3	Phil. of Science
Social Sciences		3	Core Requirement
Theology	3		Core Requirement
	<u>17</u>	<u>17</u>	

**SUMMARY**

African American Studies	3	Philosophy	6
Chemistry	49	Physical Education	1
English	9	Physics	8
Fine Arts	3	Social Sciences	6
Foreign Language	6	Speech Communication	3
History	6	Theology	6
Mathematics	22	Free Electives	5
		Total Semester Hours	<u>133</u>