

## **DEPARTMENT OF CHEMISTRY**

### **Bachelor of Science CHEMISTRY MAJOR (Forensic Chemistry Option) 2005-2006**

This degree program includes courses recommended by the American Academy of Forensic Sciences for undergraduate forensic science degree programs, and is designed to give students a formal education in chemistry and a general background in the forensic field. Students completing this degree program will be prepared to pursue employment in chemistry and forensic chemistry, as well as graduate studies in chemistry.

#### **FACULTY ADVISORS:**

Dr. Mohammed Ali, Dr. Marcus Bond, Dr. Sharon Coleman, Dr. Philip Crawford, Dr. Matthew Fasnacht, Dr. Bruce Hathaway, Dr. James McGill, Dr. Bjorn Olesen, Dr. Michael Readnour, Dr. David Ritter, Dr. Michael Rodgers

#### **CAREER OPPORTUNITIES:**

The chemical industry employs 66% of all chemists. The majority will be involved in research and product development (R & D), sales, or marketing. Many work in quality control analysis, and testing products. Others may work in areas such as industrial hygiene and safety or regulatory work for environmental compliance.

Academic institutions employ about 26% of all chemists. Ph.D.'s are required for most academic positions at the college or university level. High schools require the B.S. in education degree plus subject matter certification.

Government employs about 7% of all chemists. Federal, state, and local government agencies hire chemists for a variety of jobs including basic research, testing work needed to enforce government regulations, technical program managers, and writers and editors of government regulations and technical documents.

A smaller percentage of chemists (1%) are employed in nontraditional fields. Some are patent lawyers, science writers, information specialists, technical librarians, technical consultants, or business owners.

Forensic scientists work in crime laboratories run by city, county, or state governments, or for Federal agencies such as the Federal Bureau of Investigation, Drug Enforcement Administration, and Bureau of Alcohol, Tobacco, and Firearms.

#### **EMPLOYMENT OUTLOOK:**

In 2000, chemists and materials scientists held about 92,000 jobs in the U.S.A. This number is expected to grow by 10-20% by 2010. Much of this job growth will be concentrated in pharmaceutical companies and in firms that specialize in research and testing services. The median starting salary for BS chemists was around \$32,500 according to the ACS 2004 salary survey. (ACS data shows a direct relationship between GPA and starting salaries for BS chemists, i.e. those with higher GPA's generally start at higher salaries.) Median salary for all employed BS chemists was \$59,700 according to the ACS 2003 salary survey.

**HIGH SCHOOL PREPARATION FOR MAJOR:**

Ideal: 4 units English, 3 units of Science (Biology, Chemistry, Physics), and Math through Trigonometry and Pre-calculus.

## Requirements for B.S. in Chemistry – Forensic Chemistry Option

	<u>Credit Hours</u>
<b>University Studies Core Curriculum</b>	<b>30*</b>
The University Studies Core Must include:	
Living Systems: BI151 Biological Reasoning	
Oral Expression: SC105 Fundamentals of Oral Communication	
<b>UI-100 First Year Seminar</b>	<b>3</b>
<b>University Studies Interdisciplinary Courses</b>	<b>6*</b>
<b>Required Courses (pre-requisites)</b>	<b>60</b>
CH185/005/085 General Chemistry I (MA095 or equiv)	5**
CH186 General Chemistry II (CH185)	3
CH187 Qualitative Analysis (CH186 pre or co)	2
CH271 Quantitative Analysis (CH187)	4
CH341 Organic Chemistry I (CH186)	4
CH342 Organic Chemistry Laboratory I (CH341 pre or co)	1
CH343 Organic Chemistry II (CH342 pre or co)	3
CH344 Organic Chemistry Laboratory II (CH343 pre or co)	2
CH311 Physical Chemistry I (CH271, PH121 or PH231, MA240 pre or co)	4
CH312 Physical Chemistry II (CH311)	3
CH313 Physical Chemistry Laboratory (CH312 pre or co)	3
CH498 Professional Presentation in Chemistry (UI443)	1
UI443 Professional Experience in Chemistry	3**
MA140 Analytical Geometry and Calculus I (MA133 and MA134 or equiv)	5**
MA145 Analytical Geometry and Calculus II (MA140)	4
MA240 Analytical Geometry and Calculus III (MA145)	3
PH120/020 Introductory Physics I (MA133 and MA134 or equiv.)	5
PH121/021 Introductory Physics II (PH120)	5
<b>OR</b>	
PH230/030 General Physics I (MA145 pre or co)	5
PH231/031 General Physics II (MA240 pre or co and PH230)	5
<b>Additional hours required for Forensic Chemistry</b>	<b>17</b>
CH420 Forensic Chemistry (CH342)	4
CH575 Chemical Instrumentation (CH313 pre or co)	4
MA423 Statistical Analysis for Forensic Science (MA140)	3
CJ350 Evidence Collection and Preservation (CJ330, 5 hours of natural science)	3
<b>Take one of the following courses:</b>	
UI331 Biochemistry I (CH342)	3**
<b>OR</b>	
EV460 Introduction to Toxicology	3
<b>Electives</b>	<b>4</b>
EN100 English Composition	0-3
WP003 75 Hour Writing Exam	0
<b>Minimum Degree Requirement</b>	<b>120</b>

\*Does not include hours for University Studies courses included in core curriculum.

\*\*University Studies course

**Notes:**

1. Required courses offered in both fall and spring semesters unless otherwise specified.
2. Completion of an experiential learning project (undergraduate research, internship) in the major is required of all graduates. Requirement met by completion of CH498 Professional Presentation in Chemistry. Consult with your departmental advisor.

**BS in Chemistry (Forensic Chemistry Option)**  
**SUGGESTED 8 SEMESTER SEQUENCE<sup>♦</sup>**

<b>First Semester</b>	<b>Hrs.</b>	<b>Second Semester</b>	<b>Hrs.</b>
UI100 First Year Seminar	3	CH186 General Chemistry II	3
CH185 Gen. Chem. I Lec	5	CH187 Qualitative Analysis	2
CH085 Gen. Chem. I Lab	+	MA145 Analyt. Geom. & Calc. II	4
CH005 Gen. Chem. I Rec.	+	EN140 Rhet. & Crit. Thinking	3
MA140 Analyt. Geom. & Calc. I	5	University Studies Elective	3
EN100 English Comp	3		
<b>Third Semester*</b>	<b>Hrs.</b>	<b>Fourth Semester</b>	<b>Hrs.</b>
CH271 Quantitative Analysis	4	CH343 Organic Chem. II	3
CH341 Organic Chemistry I	4	CH344 Organic Chem. I Lab	2
CH342 Organic Chemistry II Lab	1	PH231 General Physics II Lec	5
PH230 General Physics I Lec	5	PH030 General Physics II Lab	+
PH030 General Physics I Lab	+	<b>or</b>	
<b>or</b>		PH121 Intro. Physics II Lec	5
PH120 Intro. Physics I Lec	5	PH021 Intro. Physics II Lab	+
PH020 Intro. Physics I Lab	+	University Studies Electives	6
MA240 Analyt. Geom./Calc. III	3		
<b>Fifth Semester</b>	<b>Hrs.</b>	<b>Sixth Semester</b>	<b>Hrs.</b>
CH311 Physical Chemistry I	4	CH312 Physical Chemistry II	3
University Studies Electives	9	CH313 Physical Chemistry Lab	3
MA423 Stat. Analysis for Forensic Science	3	University Studies Electives	6
		UI443 Professional Experience in Chemistry	3
		WP003 75 Hour Writing Exam	0
<b>Seventh Semester</b>	<b>Hrs.</b>	<b>Eighth Semester</b>	<b>Hrs.</b>
CH420 Forensic Chemistry	4	CH498 Professional Presentation in Chemistry	1
UI331 Biochemistry I	3	CH575 Chemical Instrumentation	4
UI3XX University Studies	3	CJ350 Evidence Collection And Preservation	3
University Studies Elective	3	Electives	4
<b>OR</b>		<b>OR</b>	
CH420 Forensic Chemistry	4	CH498 Professional Presentation in Chemistry	1
UI3XX University Studies	6	CH575 Chemical Instrumentation	4
University Studies Elective	3	CJ350 Evidence Collection And Preservation	3
		EV460 Intro. to Toxicology	3
		Electives	1

<sup>♦</sup>Assumes all prerequisites have been met for each course.

\*Since all chemistry courses numbered 200 and above may only be offered one semester a year, it is strongly recommended that all chemistry majors consult with their departmental advisor before the end of their Freshman year.