

DEPARTMENT OF CHEMISTRY

Bachelor of Science in Education (Unified Science)

CHEMISTRY MAJOR

2005-2006

Chemistry is the branch of natural science that is concerned with the description and classification of matter, with the changes which matter undergoes, and with the energy associated with each of these changes.

The Chemistry Education major provides students with a fundamental background in chemistry, prepares one to teach chemistry at the secondary level, and meets minimum State of Missouri certification requirements. The unified science component certifies one to teach entry level biology, earth science, and physics in Missouri.

FACULTY ADVISOR:

Dr. Sharon Coleman (573-651-2372)

CAREER OPPORTUNITIES:

Primary purpose of degree is to prepare one to teach chemistry at high school level.

EMPLOYMENT OUTLOOK:

Excellent; there is a severe nationwide shortage of chemistry teachers.

HIGH SCHOOL PREPARATION FOR MAJOR:

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

CHEMISTRY MAJOR
Requirement for Chemistry Major, B.S. IN EDUCATION (Unified Science) DEGREE
(Fall 2003)

	<u>Hours</u>
University Studies	27
EN-100 English Comp.	0-3
Required Courses (pre-requisites)	46-51
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), offered Fall only	4
CH310 Intro to Physical Chemistry (CH271, MA139, PH 121), offered Fall only	5
CH341 Organic Chemistry I (CH186)	4
CH342 Organic Chemistry Lab I (CH341 pre or co)	1
UI331 Biochemistry, offered Fall only	3*
UI443 Professional Experience in Chemistry offered Spring only	3*
MA133 Plane Trigonometry (MA095 or equiv +1 unit of geometry)	0-2
MA134 College Algebra (MA095 or equiv)	0-3*
MA139 Applied Calculus (MA133 and MA134)	3*
PH120/020 Introductory Physics I (MA133 and MA134 or equiv)	5
PH121/021 Introductory Physics II (PH120)	5
Environmental Science Course	3
Additional Unified Science Certification Requirements	21-22**
Professional Education Core	34***
WP-003 75 Hour Writing Test	0
Minimum Degree Requirement	128-137 HOURS

- * Meets Logical and Physical Systems, UI3XX and UI4XX (3) requirements in University Studies Program.
- ** History/Philosophy of Science and Technology (3), Biology to include Zoology and Botany (9-10), and Earth Science to include Physical Geology, Meteorology, and Oceanography (9).
- *** Block III which include SE320 Techniques of Teaching Science is offered Spring semester only.

Note: 1. Required courses offered in both Fall and Spring semesters unless otherwise specified.

SUGGESTED 9 SEMESTER SEQUENCE

Major: Chemistry

Degree: Bachelor of Science
Secondary Education (Unified Science)
Fall 2003

First Semester	Hrs	Second Semester	Hrs
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.	+	MA139 Applied Calculus	3
CH005 Gen. Chem. I Rec.	+	EN140 Rhet. & Crit. Thinking	3
MA133 Plane Trigonometry	0- 2	University Studies Elective	3
MA134 College Algebra	0- 3		
EN100 English Comp.	0- 3		
Third Semester	Hrs	Fourth Semester	Hrs
CH271 Quant. Analysis	4	CH341 Organic Chemistry I	4
PH120/020 Intro. To Physics I	5	CH342 Organic Chemistry Lab I	1
University Studies Electives	6	PH121/021 Intro. to Physics II	5
		University Studies Electives	6
Fifth Semester	Hrs	Sixth Semester	Hrs
CH310 Intro. to Physical Chemistry	5	Block I	5**
UI331 Biochemistry I	3	BO200 Plant Biology	3
University Studies	6	GO110 Physical Geology	3
BS108 Biology for Living	3	UI443 Professional Experience in Chemistry	3
Or		WP003 75 Hour Writing Exam	0
BII90 Life Process	4		
Seventh Semester	Hrs	Eighth Semester	Hrs
Block II	7	Block III	7
ZO200 Animal Biology	3	GO220 Oceanography	3
GO320 Meteorology	3	Environmental Science	3
		UI422 Scientific Reasoning	3
Ninth Semester			
Block IV	15	TOTAL	128-137

**PY222 in Block I meets University Studies Behavioral Systems

NOTES:

- To be admitted to the program, the student must:
 - have a 2.5 grade point average
 - take the ACT (American College Test) or the SAT (Scholastic Aptitude Test)
 - pass all sections of College-Basic Academic Subject Exam (C-BASE), achieve a score of at least 265 on each section or score 235 on all sections of C-BASE with an ACT or SAT score at or above the 66th percentile.
 - complete EN100, EN140 and SC105 (or equivalents) with a minimum grade of "C"
 - not be on disciplinary probation
 - have recommendation from the Block I Field Supervisor
- Since all Chemistry courses numbered 200 and above may be offered only one semester a year, students should obtain a Chemistry advisor early in the freshman year. Dr. Sharon Coleman is the chemistry education advisor.
- University studies courses required for teacher certification include PS103, SC105, USXXX, any PLXXX, any LIXXX, a course from ECXXX or GGXXX or SOXXX.

Department of Chemistry**Title of Major: Chemistry Education (B.S.Ed.) (Unified Science)**

MINIMUM DEGREE REQUIREMENTS

I. University Studies (up to 21 hours can be met within sections II, III, and IV below) 48 hours **(27 actual)**

The following University Studies courses are required for teacher certification:

EN140 Rhetoric & Critical Thinking	(3)	USxxx American History	(3)
LJxxx Literature course (200-500 level)	(3)	PLxxx Philosophy course	(3)
PS103 U.S. Political Systems	(3)	SC105 Fundamentals of Oral	
ECxxx, GGxxx, or SOxxx	(3)	Communication	(3)

II. Required Courses for the Major (up to 15 hours can also be applied to University Studies)

A. History/Philosophy of Science and Technology

UI422 Scientific Reasoning (3)*
Total Sci. Hist./Phil.: 3 Hours

B. Biology

BO200 Plant Biology (3)
 BS108-Bio. for Living, (3)*, or BS218-Bio. Sci.: A Process Approach, (3)* or BI190- Life Processes (4) (3*-4)
 ZO200 Animal Biology (3)
Total Biology: 9-10 Hours

C. Chemistry

CH185/005/085 General Chemistry I (5)*
 CH186 General Chemistry II (3)
Total Chemistry: 8 Hours

D. Physics

PH120/020 Introductory Physics (5) **OR** PH230/030 General Physics I (5)
 PH121/021 Introductory Physic (5) **OR** PH231/031 General Physics II (5)
Total Physics: 10 hours

E. Earth Science

GO110 Physical Geology (3)
 GO220 Meteorology (3)
 GO320 Oceanography (3)
Total Earth Science: 9 hours

F. Environmental Science

One of the following courses:

UI372 Earthquakes and Society (3)*
 GO305 Environmental Geoscience (3)
 BS105 Environmental Biology (3)*
 BI332 General Ecology (3)
 UI360 Recycling and Waste Manag (3)*
 CH350 Environmental Chemistry (3)
 or
 EV350 Environmental Chemistry (3)
Total Envir. Sci.: 3 hours

G. Chemistry Endorsement (Major)

CH187 Qualitative Analysis (2)
 CH271 Quantitative Analysis (4)
 CH310 Intro. to Physical Chemistry (5)
 CH340 Essentials of Organic (5)
 UI331 Biochemistry I (3)*
 UI443 Professional Experience in Chemistry (3)*

Total Chemistry Endors. : 22 add. CH hrs

III. Required Mathematics (3 hours can also be applied to University Studies)

3-8 hours
 MA133 Trigonometry (0-2)
 MA134 College Algebra (0-3)*
 MA139 Applied Calculus (3)*

IV. Professional Education

34 hours

Minimum Degree Requirements

128-137 hours

* denotes University Studies Courses

**University Studies Requirements
for
BS in Secondary Education
Chemistry Major**

		Hours
EN100 English Composition		0-3
WP003 75-hour Writing Test		0
University Studies 100-200 Level		
UI100 Creative and Critical Thinking		3
Perspectives on Individual Expression		
Artistic Expression	PL203 recommended (1)	3
Literary Expression	LIXXX- _Note: Cannot take LI243	3
Oral Expression	SC105	3
Written Expression	EN140	3
Perspectives on National Systems		
Behavioral Systems	PY222 (in Block I)	3
Living Systems	BS108 recommended	3
Logical Systems	MA134 or MA139	3
Physical Systems	CH185/085/005	5
Perspectives on Human Institutions		
Devel. of a Major Civilization	US105 or US107	3
Economic Systems	ECXXX	3
Political Systems	PS103	3
Social Systems	GGXXX or SOXXX	3
University Studies 300 and 400 Level		
UI331 Biochemistry I		3
UI443 Professional Experience in Chemistry (2)		3
UI422 Scientific Reasoning		3

(1) will also meet required PLXXX

(2) UI443 will replace UI3XX (3) requirement