

# MILLERSVILLE UNIVERSITY

Student Name:

Student I.D. #:

DEGREE: BS  
MAJOR: CHEM  
OPTION: ENVIR

**MAJOR REQUIREMENTS FOR A BS  
DEGREE IN ENVIRONMENTAL CHEMISTRY**  
Total credit hours required: 120 minimum

## REQUIREMENTS AND POLICIES FOR THE BS CHEMISTRY MAJOR

### A. Policies for Admission to the Major

1. New students (freshmen and transfers) must be admitted to the Chemistry major by the Office of Admissions upon admission to the University.
2. Admission into the Chemistry major from other departments is upon approval of the chairperson of the Chemistry Department.
3. Non-degree and continuing education students must be admitted to the Chemistry major by the Office of Admissions.

### B. Policies for Retention in the Major

1. University requirements for retention.
2. The student is required to have a 2.00 grade point average in the major courses by the end of the of sophomore year. If not, it is recommended that courses be repeated to achieve a 2.00 average in the major or that there be a change of major.
3. Chemistry majors are required to have a 2.00 grade or better in Chemistry courses required for the major at the 100 and 200 level before proceeding to a new course for which it is a prerequisite. (Currently, these courses include: CHEM 111,112, 231, 232, 251, and 265).

### C. Policies for Completion of the Major

1. Completion of all University curricular requirements.

**Note to the Student:** *This form is provided as a guide. IT is your responsibility to consult regularly with your advisor to be aware of change and curriculum details which are not incorporated on this form.*

**MAJOR SEQUENCE AND DEGREE REQUIREMENTS - REVISED**

Major: **BS CHEMISTRY**  
 Option: **ENVIRONMENTAL**  
 Major Field Requirements: **51.0 Credits**  
 Other Requirements: **28.0 Credits**

When applicable, up to six of the **REQUIRED RELATED** courses may be credited toward the Liberal Arts Core subject to normal distribution rules.

Course	No.	Short Title	C.H.	Gr Course	No.	Short Title	C.H.	Grade
<b>REQUIRED CHEMISTRY COURSES (46.0 Credits)</b>				<b>REQUIRED RELATED (28.0 Credits)</b>				
CHEM	111	Intro Chemistry I	4.0	<b>Mathematics (12.0 credits)</b>				
CHEM	112	Intro Chemistry II	4.0	MATH	161	Calculus I (Gen. Ed. MATH)	4.0	
CHEM	188	Freshman Seminar (Gen Ed FYI)	1.0	MATH	211	Calculus II (Gen. Ed. G2)	4.0	
CHEM	231	Organic Chem I	4.0	MATH	311	Calculus III	4.0	
CHEM	232	Organic Chem II	4.0	<b>Physics (10.0 credits)</b>				
CHEM	251	Inorganic Chem I	3.0	PHYS	231	Physics I with Calc (Gen. Ed. G2)	5.0	
CHEM	265	Quant Analysis	4.0	PHYS	232	Physics II with Calc (Gen. Ed. G2)	5.0	
CHEM	375	Environmental Chem	4.0	<b>Biology</b>				
CHEM	341	Physical Chem I	4.0	Competency equivalent to BIOL 100*				
CHEM	342	Physical Chem II	4.0	<b>ENVIRONMENTAL ELECTIVES (6.0 credits)</b>				
CHEM	465	Analytical Chem	4.0	<b>Select 2 courses from the following:**</b>				
CHEM	476	Environmental Chem II	4.0	BIOL	221	Concepts of Botany	4.0	
CHEM	487	Seminar in Chem I	0.5	BIOL	241	Principles of Ecology	3.0	
CHEM	488	Seminar in Chem II	0.5	BIOL	340	Persp. in Eenvt; Awareness	3.0	
CHEM	498	Independent Study	1.0	BIOL	343	Princ. of Ecol. & Evolution	4.0	
<b>CHEMISTRY ELECTIVES (5.0 Credits)</b>				ESCI	245	Environ. Meteorology	3.0	
CHEM	312	Chem in Nanotech	3.0	ESCI	349	Chemistry of the Atmosphere	3.0	
CHEM	324	Plant Biochemistry	4.0	ESCI	426	Groundwater Geology	3.0	
CHEM	326	Biochemistry I*	4.0	GEOG	202	Env. Sustainability	3.0	
CHEM	327	Biochemistry II	4.0	GEOG	230	Physical Geography	3.0	
CHEM	328	Analytical Biochem Lab	1.0	OSEH	321	Ind Hyg: Chem/Bio Haz	4.0	
CHEM	381	Polymer Chem I	4.0	OSEH	422	Ind Hyg: Physical Haz	4.0	
CHEM	391	Advanced Lab I	1.0	<b>** Other environmental courses maybe selected in consultation with academic advisor and approval of the department</b>				
CHEM	392	Advanced Lab II*	1.0	<b>*Competency in Biology rmay be demonstrated by any one of the following: 1) course grade of "A" or "B" in AP Biology; 2) score of ≥ 3 on national AP BIOL exam; 3) successful score on CLEP exam; 4) passing grade for Gen. Biol. (BIOL 100)</b>				
CHEM	300	Cooperative Educ**	3.0	<b>General Electives (as necessary)</b>				
CHEM	400	Cooperative Educ**	3.0	_____	_____	_____	_____	_____
CHEM	435	Adv. Organic Chem	3.0	_____	_____	_____	_____	_____
CHEM	452	Inorganic Chem II	3.0	_____	_____	_____	_____	_____
CHEM	486	Topics in Chemistry	1.0-4.0	<b>Note: The courses below also count in Gen Ed Requirements</b>				
CHEM	489	Department Honors	1.0-3.0	<b>G2: PHYS 231, 232 and MATH 211 (14.0 credits)</b>				
CHEM	498	Independent Study***	1.0-3.0	<b>MATH course: MATH 161 (4.0 credits)</b>				
CHEM	499	Department Honors	1.0-3.0	<b>FYI: CHEM 188 (1.0 Credits)</b>				

\* These electives must be completed to gain ACS certification.

\*\* These electives are recommended for students interested in Industrial Environmental Chemistry.

\*\*\* Students seeking ACS certification must take a minimum 2.0 credits of CHEM 498 under Chemistry Electives.

**BACHELOR OF SCIENCE IN CHEMISTRY  
ENVIRONMENTAL CHEMISTRY OPTION  
RECOMMENDED PROGRAM**

<b>FIRST SEMESTER</b>				<b>SECOND SEMESTER</b>			
CHEM	111	Intro Chem I	4.0	CHEM	112	Intro Chem II	4.0
CHEM	188	Freshman Seminar	1.0	CHEM	251	Inorganic	3.0
ENGL	110	English Composition	3.0	MATH	211	Calculus II	4.0
MATH	161	Calculus I	4.0	WELL	175	Wellness Course	<u>3.0</u>
_____	_____	Humanities Course #1	<u>3.0</u>	<i>TOTAL S.H.</i>			14.0
<b>THIRD SEMESTER</b>				<b>FOURTH SEMESTER</b>			
CHEM	231	Organic I	4.0	CHEM	232	Organic II	4.0
COMM	100	Communication	3.0	CHEM	265	Quantitative Analysis	4.0
PHYS	231	Physics I	5.0	PHYS	232	Physics II	<u>5.0</u>
MATH	311	Calculus III	<u>4.0</u>	<i>TOTAL S.H.</i>			13.0
<b>FIFTH SEMESTER</b>				<b>SIXTH SEMESTER</b>			
CHEM	341	Physical Chem I	4.0	CHEM	342	Physical Chem II	4.0
CHEM	375	Environmental I	4.0	CHEM	476	Environmental II	4.0
ENGL	3XX	Advanced Writing	3.0	_____	_____	Required Related **	3.0-4.0
_____	_____	Humanities Course #2	3.0	CHEM	498	Intro to Research	1.0
_____	_____	Social Sciences Course #1	<u>3.0</u>	_____	_____	Social Sciences Course #2	<u>3.0</u>
<b>SEVENTH SEMESTER</b>				<b>EIGHTH SEMESTER</b>			
CHEM	_____	Chemistry Elective*	4.0	CHEM	465	Analytical Chemistry	4.0
CHEM	487	Chemistry Seminar	0.5	CHEM	488	Chemistry Seminar	0.5
CHEM	_____	Chemistry Elective*	1.0	_____	_____	C&E Course #4	3.0
_____	_____	Humanities Course #3	3.0	_____	_____	Required Related **	3.0-4.0
_____	_____	Social Science Course #3	3.0	_____	_____	Perspectives Course	<u>3.0</u>
_____	_____	C&E Course #1	<u>3.0</u>	<i>TOTAL S.H.</i>			13.5-14.5

**COMMENTS, NOTES OR RECOMMENDATIONS:**

\*Biochemistry I (CHEM 326) and Advanced Lab II (CHEM 392) must be completed to gain ACS certification.

\*\*Cooperative Educ. courses: CHEM 300 and CHEM 400 are recommended for students interested in Industrial Environmental Chemistry.

\*\*Select 2 courses (6.0 credits) from the Environmental Electives block.

\*\*\*Students seeking ACS certification must take a minimum 2.0 credits of CHEM 498 under Chemistry Electives.

1. Connections & Exploration (C&E) courses #1 and #4 can be satisfied with any approved GenEd course.
2. Cultural Diversity & Community (D) course may be satisfied with approved courses from the GenEd requirements (including Perspectives), the major, the minor, the required related area, or general electives.

The American Chemical Society (ACS) and the Chemistry Department strongly recommend an Introductory Economics course (ECON 100, for example) among the Social Science (G3) electives and Elementary Foreign Language (FORL 101 and 102) among the Humanities (G1) electives. ENGL 312 (Technical Writing) is highly recommended. 10/23