

# CHEMISTRY (B.S.) ENVIRONMENTAL SCIENCES

## Major Requirements

Code	Title	Hours
CHEM 141 & CHEM 142	GENERAL CHEMISTRY I and GENERAL CHEMISTRY II	6
CHML 141 & CHML 142	GENERAL CHEMISTRY LAB and GENERAL CHEMISTRY II LAB	2
CHEM 241 & CHEM 242	ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY II	6
CHML 241 & CHML 242	ORGANIC CHEMISTRY I LAB and ORGANIC CHEMISTRY II LAB	2
CHEM 310	INTRO TO SCIENTIFIC RESEARCH	2
CHEM 320 & CHML 320	ANALYTICAL CHEMISTRY and ANALYTICAL CHEMISTRY LAB	4
CHEM 340 & CHML 340	INORGANIC CHEMISTRY I and INORGANIC CHEMISTRY LAB	4
CHEM 341 & CHML 341	PHYSICAL CHEMISTRY I and PHYSICAL CHEMISTRY I LAB	4
CHEM 380	INDEPENDENT STUDY	3
<b>Chemistry Seminar</b>		
Select two credits from the following:		2
CHEM 381	CHEMISTRY SEMINAR	
CHEM 382	CHEMISTRY SEMINAR	
CHEM 410	ENVIRONMENTAL CHEMISTRY	
CHEM 431	BIOCHEMISTRY I	
CHEM 432	BIOCHEMISTRY II	
CHEM 436	PHYSICAL ORGANIC CHEMISTRY	
CHEM 437	ORGANIC SYNTHESIS	
CHEM 439	Introduction to Polymer Chemistry	
CHEM 441	INORGANIC CHEMISTRY II	
CHEM 452	ATOMIC & MOLECULAR STRUCTURE	
CHEM 458	QUANTUM MECHANICS	
CHEM 471	FORENSIC TOXICOLOGY	
CHEM 475	FORENSIC PRACTICUM	
CHEM 481	CHEMISTRY SEMINAR	
CHEM 482	CHEMISTRY SEMINAR	
CHEM 410	ENVIRONMENTAL CHEMISTRY	S
CHEM 421 & CHML 421	CHEMICAL INSTRUMENTATION and CHEMICAL INSTRUMENTATION LAB	4
CHEM 431 & CHML 431	BIOCHEMISTRY I and BIOCHEMISTRY I LAB	4
Toxicology Option		3
<b>Total Hours</b>		<b>46</b>
Code	Title	Hours
BIO 112 & BIOL 112	GENERAL BIOLOGY and GENERAL BIOLOGY LAB	4
Environmental Option		6
Environmental Option Lab		2
<b>Total Hours</b>		<b>12</b>

## Curriculum Map

Course	Title	Hours
<b>Freshman</b>		
<b>Fall</b>		
BIO 111 & BIOL 111	GENERAL BIOLOGY and GENERAL BIOLOGY LAB	4
CHEM 141 & CHML 141	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB	4
ENG 104 or ENG 103 or ENG 111	COMPOSITION I or English Composition I with Co-requisite Support or COMPOSITION & LITERATURE FOR L	3
UNIV 100	UNIVERSITY SUCCESS	2
Humanities & Fine Arts Option		3
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
BIO 112 & BIOL 112	GENERAL BIOLOGY and GENERAL BIOLOGY LAB	4
CHEM 142 & CHML 142	GENERAL CHEMISTRY II and GENERAL CHEMISTRY II LAB	4
ENG 105 or ENG 112	COMPOSITION II or COMPOSITION	3
MATH 241	CALCULUS I WITH LABORATORY	3
Pathway Option		3
<b>Hours</b>		<b>17</b>
<b>Sophomore</b>		
<b>Fall</b>		
CHEM 241 & CHML 241	ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY I LAB	4
MATH 242	CALCULUS II WITH LABORATORY	3
PHY 211 & PHYL 211	General Physics I and GENERAL PHYSICS LAB I	4
Humanities & Fine Arts Option		3
Pathway Option		3
<b>Hours</b>		<b>17</b>
<b>Spring</b>		
CHEM 242 & CHML 242	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY II LAB	4
CHEM 340 & CHML 340	INORGANIC CHEMISTRY I and INORGANIC CHEMISTRY LAB	4
PHY 212 & PHYL 212	General Physics II and GENERAL PHYSICS LAB II	4
UNIV 200	CIVIC ENGAGEMENT	1
Pathway Option		3
<b>Hours</b>		<b>16</b>
<b>Junior</b>		
<b>Fall</b>		
CHEM 320 & CHML 320	ANALYTICAL CHEMISTRY and ANALYTICAL CHEMISTRY LAB	4
CHEM 341 & CHML 341	PHYSICAL CHEMISTRY I and PHYSICAL CHEMISTRY I LAB	4
CHEM 380	INDEPENDENT STUDY	1
CHEM 381	CHEMISTRY SEMINAR	0.5
Social & Behavioral Science Option		3
Humanities & Fine Arts Option		3
<b>Hours</b>		<b>15.5</b>
<b>Spring</b>		
CHEM 310	INTRO TO SCIENTIFIC RESEARCH	2
CHEM 380	INDEPENDENT STUDY	1
CHEM 382	CHEMISTRY SEMINAR	0.5
CHEM 429	Organic Structure Determination by Spectroscopy	3
Environmental Option and Lab		4
Social & Behavioral Science		3
<b>Hours</b>		<b>13.5</b>

Senior		
Fall		
CHEM 380	INDEPENDENT STUDY	1
CHEM 410	ENVIRONMENTAL CHEMISTRY	3
CHML 410	ENVIRONMENTAL CHEM LAB	1
CHEM 431 & CHML 431	BIOCHEMISTRY I and BIOCHEMISTRY I LAB	4
CHEM 481	CHEMISTRY SEMINAR	0.5
General Elective		3
<b>Hours</b>		<b>12.5</b>
Spring		
CHEM 421 & CHML 421	CHEMICAL INSTRUMENTATION and CHEMICAL INSTRUMENTATION LAB	4
CHEM 380	INDEPENDENT STUDY	1
CHEM 482	CHEMISTRY SEMINAR	0.5
Environmental Option and Lab		4
Toxicology Option		3
<b>Hours</b>		<b>12.5</b>
<b>Total Hours</b>		<b>120</b>

- be able to participate and contribute to new scientific discoveries and/or technology development efforts using their chemistry knowledge.

**Notes:**

- Candidates that transfer 12 or more hours of college credit are exempt from UNIV 100 UNIVERSITY SUCCESS; however, the student must take 2 hours of general electives to replace the UNIV course.
- Standardized Tests (GRE, MCAT, MFT, PCAT, etc), Chemistry Exit Exam, Research Report, and Research Presentation are required before graduation.
- Online Graduation Clearance (**to be completed during the graduating semester only**).

## Environmental Science Option Courses

Code	Title	Hours
Select two of the following with labs:		8
BIO 201	INTRO TO ENVIRONMENTAL SCIENCE	
BIOL 201	INTRO TO ENVIRONMENTAL SCI LAB	1
BIO 404	ENVIRONMENTAL SCIENCE	
BIOL 404	ENVIRONMENTAL SCIENCE LAB	1

## Toxicology Option Courses

Code	Title	Hours
Select one of the following:		3
ITHM 529	ENV TOXICOLOGY & RISK ASSESSME	
CHEM 471	FORENSIC TOXICOLOGY	
<b>Total Hours</b>		<b>3</b>

## Student Learning Outcomes

JSU Chemistry graduates will:

- acquire comprehensive knowledge of the fundamentals and application of major scientific theories in chemistry;
- be able to carry out laboratory experiments in chemistry in a safe manner as well as accurately record, analyze, and interpret the results of such experiments.
- learn, develop, and be able to apply information literacy skills in chemistry.
- be able to clearly communicate chemistry knowledge in both oral and written formats.