Chemistry, Bachelor of Science

The B.S. specializations in Chemistry and Chemistry/Biochemistry have been approved by the Committee on Professional Training of the American Chemical Society (ACS) and consist of courses designed to offer training in the fundamentals of chemistry. Opportunities exist for the student to take courses to prepare for a wide variety of careers in chemistry and related fields. The B.S. program is recommended for students wishing to enter graduate programs in chemistry or to find employment as professional chemists.

Students interested in obtaining certification to teach this subject area in secondary education need to contact an advisor in this department to carefully plan the course work to satisfy degree and some teacher certification requirements. A degree in this major is required for participation in teacher education certification options.

Program Requirements

In addition to general University requirements, students seeking the B.S. in Chemistry must meet the requirements listed below.

Students should consult with their academic advisor for courses which may satisfy both the General Education requirements and common prerequisites.

A grade of “C-” or better is required in all common prerequisites. No grade below a “C-” in a major course may be applied toward graduation.

Chemistry B.S. and Chemistry/Biochemistry B.S. specialization majors must complete the following for ACS certification:

- PHY 2048 Calculus-Based Physics I 3
- PHY 2049 Calculus-Based Physics II 3
- BCH 3033 Biochemistry I (+Lab) 4

Chemistry/Biochemistry, B.S. Specialization majors must also take the following for ACS certification:

One of the following:

- PCB 3063C Genetics 3
- MCB 3020+L Microbiology (+Lab)

Plus one additional course in biochemistry 3

B.S. Chemistry Specialization

General Education

In addition to the General Education requirements listed on this page, students must satisfy all additional University requirements, including the Gordon Rule, multicultural, and foreign language requirements. With appropriate planning and coordination with an academic advisor, students may satisfy some of the general University requirements through the General Education curriculum. For a complete listing of general degree requirements, refer to the "University Requirements" section of this catalog.

General Education Curriculum:

**Communication**

- ENC 1101 English Composition I 3
- ENC 1102 English Composition II 3

**Mathematics**

Choose one course from Group A and one Additional course from either Group A or Group B

<table>
<thead>
<tr>
<th>Group A</th>
<th></th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC 1105</td>
<td>College Algebra</td>
<td></td>
</tr>
<tr>
<td>MAC 1105C</td>
<td>College Algebra with Lab</td>
<td></td>
</tr>
<tr>
<td>MAC 2311</td>
<td>Analytic Geometry and Calculus I</td>
<td></td>
</tr>
<tr>
<td>MGF 1106</td>
<td>Mathematics for Liberal Arts I</td>
<td></td>
</tr>
<tr>
<td>MGF 1107</td>
<td>Mathematics for Liberal Arts II</td>
<td></td>
</tr>
<tr>
<td>STA 2023</td>
<td>Elements of Statistics</td>
<td></td>
</tr>
</tbody>
</table>

**Group B**

- MAC 1114 Trigonometry 3
- MAC 1140 Precalculus Algebra 3
- MAC 1147 Precalculus with Trigonometry 3
- MAC 2233 Calculus with Business Applications 3
- MAC 2312 Analytic Geometry and Calculus II 3

**Social Sciences**

Choose one course from Group A and one additional course from either Group A or Group B

<table>
<thead>
<tr>
<th>Group A</th>
<th></th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMH 2020</td>
<td>United States since 1877</td>
<td></td>
</tr>
<tr>
<td>ANT 2000</td>
<td>Introduction to Anthropology</td>
<td></td>
</tr>
<tr>
<td>ECO 2013</td>
<td>Principles of Economics Macro</td>
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</tr>
<tr>
<td>POS 2041</td>
<td>American Politics</td>
<td></td>
</tr>
<tr>
<td>PSY 2012</td>
<td>General Psychology</td>
<td></td>
</tr>
<tr>
<td>SYG 2000</td>
<td>Introduction to Sociology</td>
<td></td>
</tr>
</tbody>
</table>

**Group B**

- AMH 2010 United States to 1877 3
- ANT 2400 Current Cultural Issues 3
- ANT 2100 Introduction to Archaeology 3
- CCJ 2002 Survey of Crime and Justice 3
- CPO 2002 Comparative Politics 3
- DEP 2004 Human Development Across the Lifespan 3
- EUH 1000 Western Perspectives I 3
- EUH 1001 Western Perspectives II 3
- FIN 2104 Personal Financial Planning 3
- GEA 2000 Nations and Regions of the World 3
- GEB 1011 Introduction to Business 3
- IDH 1041 Honors Core 2 3
- INR 2002 International Politics 3
- MMC 2000 Principles of Mass Communication 3
- PLA 2013 Survey of American Law 3
- SOW 2192 Understanding Relationships in the 21st Century 3
- SPM 2010 Sport in Global Society 3
- SYG 2010 Current Social Problems 3

**Humanities**

Choose one course from Group A and one additional course from either Group A or Group B

<table>
<thead>
<tr>
<th>Group A</th>
<th></th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARH 1000</td>
<td>Art Appreciation</td>
<td></td>
</tr>
</tbody>
</table>
LIT 2000  Introduction to Literature
MUL 2010  Music Appreciation
PHI 2010  Introduction to Philosophy
THE 2000  Theatre Appreciation

Group B

AML 2010  American Literature I
AML 2020  American Literature II
AML 2072  Sex, Money, and Power in American Literature
ARH 2050  Western Survey I: Prehistory to the Medieval Period
ARH 2051  Western Survey II: Renaissance to Contemporary
ART 1015C  Exploring Artistic Vision
ART 2821  Art and Visual Culture Today
CRW 2001  Introduction to Creative Writing
ENL 2010  History of English Literature I
ENL 2020  History of English Literature II
IDH 1040  Honors Core 1
LIT 2030  Introduction to Poetry
MUH 2930  The Music Experience: Special Topics
PHI 2103  Critical Thinking
PHI 2603  Ethics in Contemporary Society
REL 1300  World Religions
THE 2300  Survey of Dramatic Literature
SPC 2608  Basic Communication Skills

Natural Sciences

Choose one course from Group A and one additional course from either Group A or Group B

Group A

AST 1002  Descriptive Astronomy
BSC 1005  General Biology for Non-Majors
BSC 1085  Anatomy and Physiology I
BSC 2010  Biology I
CHM 1020  Concepts in Chemistry
CHM 2045  General Chemistry I
ESC 2000  Introduction to Earth Science
EVR 2001  Introduction to Environmental Science
PHY 2048  Calculus-Based Physics I
PHY 2048C  University Physics I - Studio
PHY 2053  Algebra-Based Physics I

Group B

ANT 2511  Biological Anthropology
BOT 2010  General Botany
BSC 1050  Fundamentals of Ecology
BSC 1086  Anatomy and Physiology II
BSC 2011  Biology II
BSC 2311  Introduction to Oceanography and Marine Biology
CHM 1032  Fundamentals of General Chemistry
CHM 2046  General Chemistry II
CIS 2530  Introduction to Cybersecurity

Group A

AST 1002  Descriptive Astronomy
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**Passed by UWF Faculty Senate on 11/08/2002**

This list is continually updated and students are encouraged to check with their advisors for alternative options.

AML 2010  American Literature I  3
AML 2020  American Literature II  3
AML 3604  African American Literature  3
AML 3624  Black Women Writers  3
AML 4015  Topics in Nineteenth-Century American Literature  3
ANT 2000  Introduction to Anthropology  3
ANT 2301  Human Sexuality and Culture  3
ANT 3212  Peoples and Cultures of the World  3
ANT 3312  North American Indians  3
ANT 3363  Japanese Culture  3
ANT 3403  Cultural Ecology  3
ANT 4006  Anthropology of Human Rights  3
ARH 1000  Art Appreciation  3
ARH 2050  Western Survey I: Prehistory to the Medieval Period  3

- May be taken with or without lab.
- Algebra-Based Physics is usually recommended for non-science majors, while Calculus-Based Physics is recommended for science majors
- Although students receive 5 semester hours credit for PHY 2048C, an additional 3 semester science course will be needed to meet General Education requirements.

**General Education Electives**

Choose an additional course from two of the three areas of Humanities, Social Sciences and Natural Sciences

**Multicultural Courses**

An important component of a liberal education is the study of cultures other than one's own. As such, multiculturalism encompasses the appreciation of the values, expressions, and modes of organization of diverse cultural communities. To further such study, the University of West Florida requires all students pursuing a bachelor's degree to complete at least one course that explores one or more of the dimensions of another culture (language, religion, socio-economic structures, etc.). Students are exempt from this requirement if they have completed an A.A. degree, the general education program at a Florida public institution, or a baccalaureate degree.

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ANT 3363  Japanese Culture  3
ANT 3403  Cultural Ecology  3
ANT 4006  Anthropology of Human Rights  3
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- May be taken with or without lab.
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- Although students receive 5 semester hours credit for PHY 2048C, an additional 3 semester science course will be needed to meet General Education requirements.
Civic Literacy Requirement

1. Baccalaureate degree-seeking students initially entering a state university fall semester 2018 and thereafter must demonstrate competency in civic literacy through one of the following options prior to graduation:

   a. Successfully passing either POSX041 American Government or AMHX020 Introductory Survey Since 1877. Each of the courses must include the following competencies:
      i. Understanding of the basic principles and practices of American democracy and how they are applied in our republican form of government;
      ii. An understanding of the United States Constitution and its application;
      iii. Knowledge of the founding documents and how they have shaped the nature and functions of our institutions of self-government; and
      iv. An understanding of landmark Supreme Court cases, landmark legislation and landmark executive actions and their impact on law and society.

2. Achieving the standard score on one of the following assessments:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Standard Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civic Literacy Exam</td>
<td>60</td>
</tr>
<tr>
<td>Advanced Placement Government 3</td>
<td></td>
</tr>
<tr>
<td>and Politics: United States</td>
<td></td>
</tr>
<tr>
<td>Advanced Placement United States</td>
<td>4</td>
</tr>
<tr>
<td>States History</td>
<td></td>
</tr>
<tr>
<td>CLEP American Government</td>
<td>50</td>
</tr>
<tr>
<td>*BOG 8.006</td>
<td></td>
</tr>
</tbody>
</table>

Common Prerequisites

State mandated common prerequisites must be completed prior to graduation, but are not required for admission to the program. See the Common Prerequisite Manual for course substitutions from Florida colleges and universities.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHM 2045+L</td>
<td>General Chemistry I (+Lab)</td>
<td>4</td>
</tr>
<tr>
<td>CHM 2046+L</td>
<td>General Chemistry II (+Lab)</td>
<td>4</td>
</tr>
<tr>
<td>MAC 2311</td>
<td>Analytic Geometry and Calculus I (+Lab)</td>
<td>4</td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus II (+Lab)</td>
<td>4</td>
</tr>
<tr>
<td>CHM 2210+L</td>
<td>Organic Chemistry I (+Lab)</td>
<td>4</td>
</tr>
<tr>
<td>CHM 2211+L</td>
<td>Organic Chemistry II (+Lab)</td>
<td>4</td>
</tr>
</tbody>
</table>
PHY 2048+L  Calculus-Based Physics I (+Lab) *  4
PHY 2049+L  Calculus-Based Physics II (+Lab) *  4

Total Hours 32
* Indicates common prerequisites which can be used to satisfy General Education requirements.

Lower Division Electives
Students must complete sufficient 1000/2000 level electives to satisfy at least 60 sh in the lower division. Current UWF students may use elective courses at any level (1000-4000) to meet this elective requirement.

Total Hours 0-5

Major
CHM 3120+L  Analytical Chemistry (+Lab) *  4
CHM 3230  Organic Chemistry III *  3
CHM 3410  Physical Chemistry I *  5
CHM 3411  Physical Chemistry II *  4
CHM 3740L  Advanced Laboratory Techniques +  2
CHM 3741L  Physical Chemistry Laboratory +  2
CHM 4130+L  Instrumental Analysis (+Lab) *  4
CHM 4610L  Inorganic Synthesis *  1
CHM 4611  Inorganic Chemistry *  4
CHM 4931  Seminars in Chemistry *  1

Choose 10-11 sh (with approval from departmental advisor):  10-11
  BCH 3033+L  Biochemistry I (+Lab)
  CHM 4455+L  Introduction to Polymer Science (+Lab)
  CHM 4912  Undergraduate Chemistry Research *
  CHM 3940  Chemistry Internship *
  CHM 4930  Seminar: Special Topics in Advanced Chemistry *

Total Hours 40-41
* Courses offered for a variable number of semester hours.
+ Courses included in the major GPA

Honors Research Track
CHM 2XXX  Research Experience *  2
CHM 4931  Seminars in Chemistry *  1
CHM 3740L  Advanced Laboratory Techniques +  2
CHM 3410  Physical Chemistry I *  5
CHM 3320  Organic Chemistry III *  3
CHM 3411  Physical Chemistry II *  4
CHM 3741L  Physical Chemistry Laboratory +  2
CHM 3120+L  Analytical Chemistry (+Lab) *  4
CHM 4130+L  Instrumental Analysis (+Lab) *  4

Chemistry Elective  3-4
CHM 4611  Inorganic Chemistry *  4
CHM 4610L  Inorganic Synthesis *  1
CHM 4912  Undergraduate Chemistry Research *  8

This specialization is only for students in the Honors Program, and requires completion of an Honors thesis.

Upper Division Electives
Student must complete sufficient 3000/4000 level electives to meet UWF’s requirement of 48 semester hours in the upper division or complete all departmental requirements at the 3000/4000 level, whichever is greater.

Total Hours 19-20

B.S. Chemistry/Biochemistry Specialization

General Education
In addition to the General Education requirements listed on this page, students must satisfy all additional University requirements, including the Gordon Rule, multicultural, and foreign language requirements. With appropriate planning and coordination with an academic advisor, students may satisfy some of the general University requirements through the General Education curriculum. For a complete listing of general degree requirements, refer to the “University Requirements” section of this catalog.

General Education Curriculum:

Communication
ENC 1101  English Composition I  3
ENC 1102  English Composition II  3

Mathematics
Choose one course from Group A and one additional course from either Group A or Group B

Group A
MAC 1105  College Algebra
MAC 1105C  College Algebra with Lab
MAC 2311  Analytic Geometry and Calculus I
MGF 1106  Mathematics for Liberal Arts I
MGF 1107  Mathematics for Liberal Arts II
STA 2023  Elements of Statistics

Group B
MAC 1114  Trigonometry
MAC 1140  Precalculus Algebra
MAC 1147  Precalculus with Trigonometry
MAC 2233  Calculus with Business Applications
MAC 2312  Analytic Geometry and Calculus II

Social Sciences
Choose one course from Group A and one additional course from either Group A or Group B

Group A
AMH 2020  United States since 1877
ANT 2000  Introduction to Anthropology
ECO 2013  Principles of Economics Macro
POS 2041  American Politics
PSY 2012  General Psychology
SYG 2000  Introduction to Sociology

Group B
AMH 2010  United States to 1877
ANT 2400  Current Cultural Issues
ANT 2100  Introduction to Archaeology
CCJ 2002  Survey of Crime and Justice  
CPO 2002  Comparative Politics  
DEP 2004  Human Development Across the Lifespan  
EUH 1000  Western Perspectives I  
EUH 1001  Western Perspectives II  
FIN 2104  Personal Financial Planning  
GEA 2000  Nations and Regions of the World  
GEB 1011  Introduction to Business  
IDH 1041  Honors Core 2  
INR 2002  International Politics  
MMC 2000  Principles of Mass Communication  
PLA 2013  Survey of American Law  
SOW 2192  Understanding Relationships in the 21st Century  
SPM 2010  Sport in Global Society  
SYG 2010  Current Social Problems  

**Humanities**  
Choose one course from Group A and one additional course from either Group A or Group B  

**Group A**  
- ARH 1000  Art Appreciation  
- LIT 2000  Introduction to Literature  
- MUL 2010  Music Appreciation  
- PHI 2010  Introduction to Philosophy  
- THE 2000  Theatre Appreciation  

**Group B**  
- AML 2010  American Literature I  
- AML 2020  American Literature II  
- AML 2072  Sex, Money, and Power in American Literature  
- ARH 2050  Western Survey I: Prehistory to the Medieval Period  
- ARH 2051  Western Survey II: Renaissance to Contemporary  
- ART 1015C  Exploring Artistic Vision  
- ART 2821  Art and Visual Culture Today  
- CRW 2001  Introduction to Creative Writing  
- ENL 2010  History of English Literature I  
- ENL 2020  History of English Literature II  
- IDH 1040  Honors Core 1  
- LIT 2030  Introduction to Poetry  
- MUH 2930  The Music Experience: Special Topics  
- PHI 2103  Critical Thinking  
- PHI 2603  Ethics in Contemporary Society  
- REL 1300  World Religions  
- THE 2300  Survey of Dramatic Literature  
- SPC 2608  Basic Communication Skills  

**Natural Sciences**  
Choose one course from Group A and one additional course from either Group A or Group B  

**Group A**  
- AST 1002  Descriptive Astronomy  
- BSC 1005  General Biology for Non-Majors  
- BSC 1085  Anatomy and Physiology I  
- BSC 2010  Biology I  
- CHM 1020  Concepts in Chemistry  
- CHM 2045  General Chemistry I  
- ESC 2000  Introduction to Earth Science  
- EVR 2001  Introduction to Environmental Science  
- PHY 2048  Calculus-Based Physics I  
- PHY 2048C  University Physics I - Studio  
- PHY 2053  Algebra-Based Physics I  

**Group B**  
- ANT 2511  Biological Anthropology  
- BOT 2010  General Botany  
- BSC 1050  Fundamentals of Ecology  
- BSC 1086  Anatomy and Physiology II  
- BSC 2011  Biology II  
- BSC 2311  Introduction to Oceanography and Marine Biology  
- CHM 1032  Fundamentals of General Chemistry  
- CHM 2046  General Chemistry II  
- CIS 2530  Introduction to Cybersecurity  
- GEO 1200  Physical Geography  
- GLY 2010  Physical Geology  
- MCB 1000  Fundamentals of Microbiology  
- PHC 2082  Informatics and Your Health  
- PHY 2049  Calculus-Based Physics II  
- PHY 2054  Algebra-Based Physics II  

* May be taken with or without lab.  
** Algebra-Based Physics is usually recommended for non-science majors, while Calculus-Based Physics is recommended for science majors  
*** Although students receive 5 semester hours credit for PHY 2048C, an additional 3 semester science course will be needed to meet General Education requirements.  

**General Education Electives**  
Choose an additional course from two of the three areas of Humanities, Social Sciences and Natural Sciences  

**Multicultural Requirement**  
**Multicultural Courses**  
An important component of a liberal education is the study of cultures other than one's own. As such, multiculturalism encompasses the appreciation of the values, expressions, and modes of organization of diverse cultural communities. To further such study, the University of West Florida requires all students pursuing a bachelor's degree to complete at least one course that explores one or more of the dimensions of another culture (language, religion, socio-economic structures, etc.). Students are exempt from this requirement if they have completed an A.A. degree, the general education program at a Florida public institution, or a baccalaureate degree.  

The requirement is satisfied by the successful completion of a multicultural course designated on the following list. Several of the selections are General Education courses, and students may enroll
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<tr>
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<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AML 2010</td>
<td>American Literature I</td>
<td>3</td>
</tr>
<tr>
<td>AML 2020</td>
<td>American Literature II</td>
<td>3</td>
</tr>
<tr>
<td>AML 3604</td>
<td>African American Literature</td>
<td>3</td>
</tr>
<tr>
<td>AML 3624</td>
<td>Black Women Writers</td>
<td>3</td>
</tr>
<tr>
<td>AML 4015</td>
<td>Topics in Nineteenth-Century American Literature</td>
<td>3</td>
</tr>
<tr>
<td>ANT 2000</td>
<td>Introduction to Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>ANT 2301</td>
<td>Human Sexuality and Culture</td>
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<td>ANT 3212</td>
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<td>North American Indians</td>
<td>3</td>
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<tr>
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<td>Japanese Culture</td>
<td>3</td>
</tr>
<tr>
<td>ANT 3403</td>
<td>Cultural Ecology</td>
<td>3</td>
</tr>
<tr>
<td>ANT 4006</td>
<td>Anthropology of Human Rights</td>
<td>3</td>
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<tr>
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<td>Art Appreciation</td>
<td>3</td>
</tr>
<tr>
<td>ARH 2050</td>
<td>Western Survey I: Prehistory to the Medieval Period</td>
<td>3</td>
</tr>
<tr>
<td>ARH 2051</td>
<td>Western Survey II: Renaissance to Contemporary</td>
<td>3</td>
</tr>
<tr>
<td>ARH 3590</td>
<td>Non-Western Art</td>
<td>3</td>
</tr>
<tr>
<td>ARH 3606</td>
<td>Native American Art</td>
<td>3</td>
</tr>
<tr>
<td>ARH 4302</td>
<td>Late Renaissance Art in Italy</td>
<td>3</td>
</tr>
<tr>
<td>ARH 4305</td>
<td>Early Italian Renaissance Art</td>
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<td>Contemporary Art</td>
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<td>ARH 4563</td>
<td>Art of Japan</td>
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<td>Inscribed Bodies: Concepts of Tattoo and Body Art in World History</td>
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<td>CGJ 3678</td>
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<td>Rome and the Mediterranean World</td>
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<td>LIT 2030</td>
<td>Introduction to Poetry</td>
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<td>LIT 3233</td>
<td>Postcolonial Literature</td>
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<td>LIT 4385</td>
<td>Feminist Theory</td>
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<td>New Perspectives on the Religious Self</td>
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<td>SOP 3730</td>
<td>Psychology, Culture, and Society</td>
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<td>Human Diversity and Social Justice</td>
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<td>SOW 4941</td>
<td>Immersive Experiences in Social Work</td>
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<tr>
<td>SPN 3400</td>
<td>Advanced Stylistics</td>
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<td>SPN 4500</td>
<td>Spanish Civilization</td>
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<td>SPN 4520</td>
<td>Latin American Culture and Civilization</td>
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<tr>
<td>SYO 4530</td>
<td>Inequality in America</td>
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**Civic Literacy Requirement**

1. Baccalaureate degree-seeking students initially entering a state university fall semester 2018 and thereafter must demonstrate competency in civic literacy through one of the following options prior to graduation:
   a. Successfully passing either POSX041 American Government or AMHX020 Introductory Survey Since 1877. Each of the courses must include the following competencies:
      i. Understanding of the basic principles and practices of American democracy and how they are applied in our republican form of government;
      ii. An understanding of the United States Constitution and its application;
      iii. Knowledge of the founding documents and how they have shaped the nature and functions of our institutions of self-government; and
An understanding of landmark Supreme Court cases, landmark legislation and landmark executive actions and their impact on law and society.

Achieving the standard score on one of the following assessments:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Standard Score</th>
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<tbody>
<tr>
<td>Civic Literacy Exam</td>
<td>60</td>
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<tr>
<td>Advanced Placement Government and Politics: United States</td>
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<tr>
<td>Advanced Placement United States History</td>
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</tr>
<tr>
<td>CLEP American Government</td>
<td>50</td>
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*BOG 8.006*

**Common Prerequisites**

State mandated common prerequisites must be completed prior to graduation, but are not required for admission to the program. See the Common Prerequisite Manual for course substitutions from Florida colleges and universities.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CHM 2045+L</td>
<td>General Chemistry I (+Lab)</td>
<td>4</td>
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<tr>
<td>CHM 2046+L</td>
<td>General Chemistry II (+Lab)</td>
<td>4</td>
</tr>
<tr>
<td>MAC 2311</td>
<td>Analytic Geometry and Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>CHM 2210+L</td>
<td>Organic Chemistry I (+Lab)</td>
<td>4</td>
</tr>
<tr>
<td>CHM 2211+L</td>
<td>Organic Chemistry II (+Lab)</td>
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<tr>
<td>PHY 2048+L</td>
<td>Calculus-Based Physics I (+Lab)</td>
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<tr>
<td>PHY 2049+L</td>
<td>Calculus-Based Physics II (+Lab)</td>
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</table>

Total Hours: 32

* Indicates common prerequisites which can be used to satisfy General Education requirements.

**Lower Division Electives**

Students must complete sufficient 1000/2000 level electives to satisfy at least 60 sh in the lower division. Current UWF students may use elective courses at any level (1000-4000) to meet this elective requirement. Majors should complete the Physics or Organic Chemistry sequence not completed in the Common Prerequisites.

Total Hours: 0-5

**Major**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CHM 320+L</td>
<td>Analytical Chemistry (+Lab)</td>
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<td>CHM 3230</td>
<td>Organic Chemistry III</td>
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<td>CHM 3410</td>
<td>Physical Chemistry I</td>
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<td>CHM 3411</td>
<td>Physical Chemistry II</td>
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<tr>
<td>CHM 3740+L</td>
<td>Advanced Laboratory Techniques</td>
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<tr>
<td>CHM 3741+L</td>
<td>Physical Chemistry Laboratory</td>
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<td>CHM 4931</td>
<td>Seminars in Chemistry</td>
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<tr>
<td>CHM 4610+L</td>
<td>Inorganic Synthesis</td>
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<tr>
<td>CHM 4611</td>
<td>Inorganic Chemistry</td>
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Choose two of the following (advisor approved): 8

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<tbody>
<tr>
<td>BCH 3033+L</td>
<td>Biochemistry I (+Lab)</td>
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<td>BCH 3034</td>
<td>Biochemistry II</td>
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<td>MCB 3020+L</td>
<td>Microbiology (+Lab)</td>
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<td>PCB 3063C</td>
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**Upper Division Electives**

Student must complete sufficient 3000/4000 level electives to meet UWF’s requirement of 48 semester hours in the upper division or complete all departmental requirements at the 3000/4000 level, whichever is greater.

Total Hours: 18-20

**Major Related**

<table>
<thead>
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<th>Course Name</th>
<th>Hours</th>
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<td>Biology I (+Lab)</td>
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<tr>
<td>BSC 2011+L</td>
<td>Biology II (+Lab)</td>
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Total Hours: 8

**Choose 3-4 from the following (advisor approved): 6-8**

<table>
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<td>CHM 4130+L</td>
<td>Instrumental Analysis (+Lab)</td>
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<tr>
<td>CHM 4455+L</td>
<td>Introduction to Polymer Science (+Lab)</td>
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</tr>
<tr>
<td>CHM 3940</td>
<td>Chemistry Internship</td>
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<tr>
<td>CHM 4912</td>
<td>Undergraduate Chemistry Research</td>
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<tr>
<td>CHM 4930</td>
<td>Seminar: Special Topics in Advanced Chemistry</td>
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Total Hours: 40-42

+ Courses included in the major GPA