

# CHEMISTRY

Degree: Bachelor of Science  
Bachelor of Arts  
Specializations: Chemistry (B.S. or B.A.),  
Chemistry/Biochemistry (B.S. or B.A.),  
Fast Track Master's  
Minor: Chemistry  
Department: Chemistry  
Building 58, Room 151  
(850) 474-2739  
<http://uwf.edu/chemistry/>  
[chemistry@uwf.edu](mailto:chemistry@uwf.edu)  
College: Arts and Sciences  
Semester Hours Required for Degree: 120

Faculty: M.T. Huggins (Chairperson), J.E. Gurst, G. Martin, A.T. Royappa, P.S. Tanner, L.W. ter Haar, P.P. Vaughan

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.

The B.A. specializations in Chemistry and Chemistry/Biochemistry are designed for students who need a strong background in chemistry for application in other fields such as business, education, forensic science, pre-medical, pre-dental, pre-law, and some environmental fields.

For highly qualified students, a fast-track program leading to a B.S. and an M.S. is available in biologically-related areas. For information about this program, please see the Biology Program in the Master's degree programs.

## PROGRAM REQUIREMENTS

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

Students should consult with their academic advisor for courses which may satisfy both the General Studies 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 PHY 2048, PHY 2049 and BCH 3034/L for ACS certification. Chemistry/Biochemistry, B.S. Specialization majors must also take PCB 3063/L or MCB 3020/L plus one additional course in biochemistry for ACS certification.

## BACHELOR OF SCIENCE

### CHEMISTRY B.S. SPECIALIZATION

#### General Studies (36 sh)

For additional information see the General Studies section of this *Catalog*.

#### Common Prerequisites (24 sh)

State mandated common prerequisites must be completed prior to graduation, but are not required for admission to the program. Courses in brackets indicate substitutes from Florida public community/junior colleges and universities.

+CHM 2045/L	General Chemistry I/Lab .....	4
	[CHM X045/L, X045C, X045E, or X040 & X041]	
+CHM 2046/L	General Chemistry II/Lab .....	4
	[CHM X046/L, X046C, X046E]	
+MAC 2311	Analytic Geometry & Calculus I.....	4
	[MAC X311, X281]	
+MAC 2312	Analytic Geometry & Calculus II.....	4
	[MAC X312, X282]	

Choose one option:

##### Option 1

CHM 2210/L	Organic Chemistry I/Lab .....	4
	[CHM X210C or CHM X210/L]	
CHM 2211/L	Organic Chemistry II/Lab .....	4
	[CHM X211C or CHM X211/L]	

##### Option 2

+PHY 2048/L	University Physics I/Lab .....	4
	[PHY X048C or PHY X048/L]	
+PHY 2049/L	University Physics II/Lab .....	4
	[PHY X049C or PHY X049/L]	

or

+PHY 2053/L	General Physics I/Lab .....	4
	[PHY X053C or PHY X053/L]	
+PHY 2054/L	General Physics II/Lab .....	4
	[PHY X054C or PHY X054/L]	

+ Indicates common prerequisites which can be used to satisfy General Studies requirements.

#### Lower Division Electives (0-13 sh)

Sufficient 1000/2000 level electives to complete at least 60 semester hours in the lower division. Current UWF students may use elective courses at any level (1000-4999) to meet this elective requirement. Majors should complete the Physics or Organic Chemistry sequence not completed in the Common Prerequisites.

#### Major (38-47 sh)

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	Advanced Inorganic Chemistry .....	4

With departmental advisor approval, choose three courses from:

BCH 3034/L	General Biochemistry: Metabolism/Lab .....	4
CHM 4455/L	Introduction to Polymer Science/Lab .....	3
CHM 4512	Computational Chemistry .....	3
CHM 4714C	Materials, Chemistry, and Engineering .....	3

CHM 4912	Undergraduate Chemistry Research.....	3
	Course offered 2-4 sh per semester	
CHM 4930	Seminar: Special Topics in Advanced Chemistry .....	3
	Course offered 3-4 sh per semester	

If not completed at lower division:

CHM 2210/L	Organic Chemistry I/Lab.....	0-4
CHM 2211/L	Organic Chemistry II/Lab.....	0-4

### Major-Related (0-8 sh)

If not completed at the lower division, choose one option:

Option 1

PHY 2048/L	University Physics I/Lab .....	4
PHY 2049/L	University Physics II/Lab .....	4

Option 2

PHY 2053/L	General Physics I/Lab .....	4
PHY 2054/L	General Physics II/Lab .....	4

### Upper Division Electives (13-22 sh)

Sufficient 3000/4000 level electives to meet UWF's requirement of 48 semester hours in the upper division or completion of all departmental requirements at the 3000/4000 level, whichever is greater.

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## CHEMISTRY/BIOCHEMISTRY B.S. SPECIALIZATION

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### General Studies (36 sh)

For additional information see the General Studies section of this *Catalog*.

### Common Prerequisites (32 sh)

State mandated common prerequisites must be completed prior to graduation, but are not required for admission to the program. Courses in brackets indicate substitutes from Florida public community/junior colleges and universities.

+BOT 2010/L	General Botany/Lab.....	4
	[BSC X011/L]	
+CHM 2045/L	General Chemistry I/Lab.....	4
	[CHM X045C, CHM X045E]	
+CHM 2046/L	General Chemistry II/Lab.....	4
	[CHM X046C, CHM X046E]	
+MAC 2311	Analytic Geometry & Calculus I.....	4
	[MAC X311, X281]	
+MAC 2312	Analytic Geometry & Calculus II.....	4
	[MAC X312, X282]	
+ZOO 1010/L	General Zoology/Lab.....	4
	[BSC X010/L]	

Choose one option:

Option 1

CHM 2210/L	Organic Chemistry I/Lab .....	4
	[CHM X210C or CHM X210/L]	
CHM 2211/L	Organic Chemistry II/Lab.....	4
	[CHM X211C or CHM X211/L]	

Option 2

+PHY 2048/L	University Physics I/Lab .....	4
	[PHY X048C or PHY X048/L]	
+PHY 2049/L	University Physics II/Lab .....	4
	[PHY X049C or PHY X049/L]	

or

+PHY 2053/L	General Physics I/Lab .....	4
	[PHY X053C or PHY X053/L]	
+PHY 2054/L	General Physics II/Lab .....	4
	[PHY X054C or PHY X054/L]	

+ Indicates common prerequisites which can be used to satisfy General Studies requirements.

### Lower Division Electives (0-5 sh)

Sufficient 1000/2000 level electives to complete at least 60 semester hours in the lower division. Current UWF students may use elective courses at any level (1000-4999) to meet this elective requirement. Majors should complete the Physics or Organic Chemistry sequence not completed in the Common Prerequisites.

### Major (39-49 Hours)

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 4610L	Inorganic Synthesis.....	1
CHM 4611	Inorganic Chemistry .....	4

With approval of departmental advisor, choose two courses from Group A and two courses from Group B:

Group A

BCH 3034/L	General Biochemistry: Metabolism/Lab .....	4
PCB 3063/L	Genetics/Laboratory.....	4
MCB 3020/L	Microbiology/Laboratory.....	4
PCB 4524/L	Molecular Biology/Laboratory .....	4

Group B

CHM 4130/L	Instrumental Analysis/Lab.....	4
CHM 4455/L	Introduction to Polymer Science/Lab .....	3
CHM 4512	Computational Chemistry.....	3
CHM 4714C	Materials, Chemistry, and Engineering .....	3
CHM 4912	Undergraduate Chemistry Research .....	3
	Course offered 2-4 sh per semester	
CHM 4930	Seminar: Special Topics in Advanced Chemistry .....	3-4
	Course offered 3-4 sh per semester	

If not taken at the Lower Division:

CHM 2210/L	Organic Chemistry I/Lab .....	0-4
CHM 2211/L	Organic Chemistry II/Lab .....	0-4

### Major-Related (0-8 sh)

If not completed at the Lower Division, choose one option:

Option 1

PHY 2048/L	University Physics I/Lab .....	4
PHY 2049/L	University Physics II/Lab.....	4

Option 2

PHY 2053/L	General Physics I/Lab .....	4
PHY 2054/L	General Physics II/Lab.....	4

### Upper Division Electives (11-21 sh)

Sufficient 3000/4000 level electives to meet UWF's requirement of 48 semester hours in the upper division or completion of all departmental requirements at the 3000/4000 level, whichever is greater.

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## BIOLOGICAL CHEMISTRY FAST TRACK BACHELORS/MASTER'S SPECIALIZATION

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This B.S./M.S. program is a 5-year (fast-track) program leading to a bachelor's degree in Chemistry and a master's degree in Biology with a specialization in Biological Chemistry. If students did not complete the admission foreign language in high school or community college, then they must complete it before receiving the bachelor's degree. During the first three years, students will satisfy the foundational requirements of the

Chemistry/Biochemistry Specialization. In the fourth year students will complete most of the requirements for the B.S. degree and will begin graduate work and research in the Biological Chemistry Specialization within the M.S. program in Biology. The two degrees will be awarded concurrently upon completion of all requirements for the M.S. degree.

### General Studies (36 sh)

For additional information see the General Studies section of the *Catalog*.

### Common Prerequisites (32 sh)

Same as Chemistry/Biochemistry Specialization

### Lower Division Electives (0-5 sh)

Same as Chemistry/Biochemistry Specialization

### Major (39-47 sh)

BCH 3033/L	Biochemistry I/Lab .....	4
BCH 3034/L	General Biochemistry: Metabolism/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
MCB 3020/L	Microbiology/Lab .....	4
PCB 3063/L	Genetics/Lab .....	4
PCB 3253/L	Developmental Biology/Lab .....	4
Advisor approved 3000/4000 level course .....		3

If not completed at the lower division:

CHM 2210/L	Organic Chemistry I/Lab .....	0-4
CHM 2211/L	Organic Chemistry II/Lab .....	0-4

### Major-Related (21 sh)

If not completed at the lower division:

PHY 2048/L	University Physics I/Lab .....	0-4
PHY 2049/L	University Physics II/Lab .....	0-4
or		
PHY 2053/L	General Physics I/Lab .....	0-4
PHY 2054/L	General Physics II/Lab .....	0-4

Students must complete all requirements for the MS in Biology (Biological Chemistry Specialization). Upon completion, up to 21 hours will be applied to the baccalaureate degree.

### Master's Requirements

See the Biological Chemistry Fast Track Specialization in the Biology listing of the Master's degree programs.

## BACHELOR OF ARTS

### CHEMISTRY, B.A.

The program is designed for students who need a strong background in chemistry for application in other fields. The tracks within this program are: business, pre-law, and education, and chemical hygiene. Each track has the same core of chemistry courses and a set of required courses which depends on the area of concentration. The education track meets the American Chemical Society recommendations for a Chemistry/Education degree.

### General Studies (36 sh)

Same as Chemistry Bachelor of Science Specialization

### Common Prerequisites (24 sh)

Same as Chemistry Bachelor of Science Specialization

### Lower Division Electives (0-13 sh)

Same as Chemistry Bachelor of Science Specialization

### Major (24-32 sh)

CHM 3120/L	Analytical Chemistry .....	4
CHM 3400C	Basic Physical Chemistry .....	4
CHM 4611	Inorganic Chemistry .....	4

With the approval of the departmental advisor, choose 12 semester hours of coursework from:

CHM 3XX0	Chemistry Internship .....	1-2
	(Course offered 1 sh per semester)	
CHM 3230	Organic Chemistry III .....	3
CHM 3740L	Advanced Laboratory Techniques .....	2
CHM 4130/L	Instrumental Analysis .....	4
CHM 4455/L	Introduction to Polymer Science .....	3
CHM 4512	Computational Chemistry .....	3
CHM 4714C	Materials, Chemistry, and Engineering .....	3
CHM 4912	Undergraduate Chemistry Research .....	3
	(Course offered 3-4 sh per semester)	
CHM 4930	Special Topics in Advanced Chemistry .....	3-4
	(Course offered 2-4 sh per semester)	

If not completed at lower division:

CHM 2210/L	Organic Chemistry I/Lab .....	0-4
CHM 2211/L	Organic Chemistry II/Lab .....	0-4

### Major-Related (15-27 sh)

Choose one of the following options.

#### Business Option (18 sh).

GEB 3032	Business Foundations for Non-Business Majors .....	3
MAR 4403	Sales Management .....	3
MAR 4412	Professional Selling Methods .....	3

Choose one:

STA 2023	Elements of Statistics .....	3
STA 3162C	Applied Statistics .....	3

Choose two courses from:

ACG 3082	Accounting for Non-Majors .....	3
ECO 3003	Principles of Economic Theory and Public Policy .....	3
MAN 3025	Management Fundamentals .....	3

#### Pre-Law Option (15 sh)

CJL 3510	Judicial Process .....	3
PLA 4263	Evidence .....	3
PLA 4308	Criminal Procedure .....	3

Choose two courses from:

EVR 4035	Environmental Law .....	3
PLA 3103	Legal Research and Writing .....	3
PLA 4273	Tort Law .....	3
PLA 4304	Criminal Law .....	3

#### Education Option (15 sh)

EDF 3234	Applied Foundations of Education .....	3
EDG 3323C	General Methods for Teaching K-12 Students .....	3
ESE 4322	Instruction, Management, and Assessment: Secondary Education .....	3
ESE 4940	ESOL/Reading Professional Practicum II .....	3
SCE 4320	Teaching Science in Middle and Secondary Schools .....	3

**Chemical Hygiene Option (18-19)**

ETI 3704	Industrial Safety (OSHA) .....	3
PHC 4XX1	Fundamentals of Occupational Health and Safety .....	3
PHC 4XXX	Fundamentals of Industrial Hygiene .....	3
PHC 4183	Medical Disaster Management .....	3
EVR 4035	Environmental Law .....	3
One additional adviser elective course .....		3-4

**Minor Option**

Students must complete an adviser approved minor or its 15-18 sh equivalent in a field related to the student's career objectives and additional approved 3000/4000 level electives outside chemistry.

**All Options (0-8 sh):**

*If not completed in the lower division*

PHY 2048/L	University Physics I/Lab .....	0-4
PHY 2049/L	University Physics II/Lab .....	0-4
<i>or</i>		
PHY 2053/L	General Physics I/Lab .....	0-4
PHY 2054/L	General Physics II/Lab .....	0-4

**Upper-Division Electives (1-21 sh)**

Sufficient 3000/4000 level electives to meet UWF's requirement of 48 semester hours in the upper division or completion of all departmental requirements at the 3000/4000 level, whichever is greater.

**CHEMISTRY/BIOCHEMISTRY B.A.**

The program is designed for students who need a strong background in chemistry/biochemistry for application in other fields. The tracks within this program are: Environmental, Forensics, Pre-medical, and Medicinal Chemistry. Each track has the same core of chemistry courses and a set of required courses which depends on the area of concentration. The pre-medical track prepares students for admission to medical, dental, and pharmacy schools while providing the broad based education preferred by these institutions.

**General Studies (36 sh)**

Same as Chemistry/Biochemistry Bachelor of Science Specialization

**Common Prerequisites (32 sh)**

Same as Chemistry/Biochemistry Bachelor of Science Specialization

**Lower Division Electives (0-5 sh)**

Same as Chemistry/Biochemistry Bachelor of Science Specialization

**Major (24-32 sh)**

CHM 3120/L	Analytical Chemistry .....	4
CHM 3400C	Basic Physical Chemistry .....	4
CHM 4611	Inorganic Chemistry .....	4

*With the approval of the departmental advisor, choose 12 semester hours of coursework from:*

CHM 3XX0	Chemistry Internship .....	1-2
(Course offered 1 sh per semester)		
CHM 3230	Organic Chemistry III .....	3
CHM 3740L	Advanced Laboratory Techniques .....	2
CHM 4130/L	Instrumental Analysis .....	4
CHM 4455/L	Introduction to Polymer Science .....	3
CHM 4512	Computational Chemistry .....	3
CHM 4714C	Materials, Chemistry, and Engineering .....	3

CHM 4912	Undergraduate Chemistry Research .....	3
(Course offered 2-4 sh per semester)		
CHM 4930	Special Topics in Advanced Chemistry .....	3-4
(Course offered 3-4 sh per semester)		

*If not completed at lower division:*

CHM 2210/L	Organic Chemistry I/Lab .....	0-4
CHM 2211/L	Organic Chemistry II/Lab .....	0-4

**Major-Related (17-28 sh)**

*Choose one of the following options:*

**Environmental Option (19 sh)**

GEO 3260/L	Geography of Soils/Laboratory .....	4
GEO 4280/L	Basic Hydrology/Laboratory .....	4
GLY 2010/L	Physical Geology/laboratory .....	4
GLY 3031C	Environmental Geology .....	4

*Choose one:*

EVR 4035	Environmental Law .....	3
EVR 4037	Environmental Auditing (preferred) .....	3

**Pre-Medical Option (17-18 sh)**

ENC 3250	Professional Writing .....	3
PHI 4633	Biomedical Ethics .....	3

*Choose three:*

BCH 3034/L	General Biochemistry: Metabolism .....	4
MCB 3020/L	Microbiology/lab .....	4
PCB 3063/L	Genetics/Laboratory .....	4
PCB 4703	Human Physiology .....	3

**Forensic Sciences Option (18 sh)**

CCJ 3024	The American Criminal Justice System .....	3
CCJ 3654	Substance Abuse and the Offender .....	3
CCJ 4036	Behavioral Science and the Law .....	3
CJE 3670	Introduction to Forensic Sciences .....	3

*Choose two courses from:*

ANT 3520	Forensic Anthropology .....	3
CCJ 3014	Criminology .....	3
CCJ 4239	Criminal Investigation .....	3
PLA 4263	Evidence .....	3
PLA 4308	Criminal Procedure .....	3

**Medicinal Chemistry Option (19-20)**

BCH 3034/L	General Biochemistry: Metabolism .....	4
PCB 3063/L	Genetics/Laboratory .....	4
PCB 4233/L	Immunology/lab .....	4
PCB 4524/L	Molecular Biology/Lab .....	4
Advisor Approved Elective Course .....		3-4

**Minor Option**

Students must complete an adviser approved minor or its 15-18 sh equivalent in a field related to the student's career objectives and additional approved 3000/4000 level electives outside chemistry.

*If not completed at the lower level choose one option:*

<b>Option 1</b>		
PHY 2048/L	University Physics I/Lab .....	0-4
PHY 2049/L	University Physics II/Lab .....	0-4

**Option 2**

PHY 2053/L	General Physics I/Lab .....	0-4
PHY 2054/L	General Physics II/Lab .....	0-4

**Upper-Division Electives (8-19 sh)**

Sufficient 3000/4000 level electives to meet UWF's requirement of 48 semester hours in the upper division or completion of all departmental requirements at the 3000/4000 level, whichever is greater.

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**MINOR**

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The Minor in Chemistry is designed for students majoring in other science disciplines. Chemistry majors may not earn this minor. The following requirements must be completed.

CHM	2045/L	General Chemistry I/Lab .....	4
CHM	2046/L	General Chemistry II/Lab .....	4
CHM	2210/L	Organic Chemistry I/Lab .....	4
CHM	2211/L	Organic Chemistry II/Lab .....	4
CHM	3120/L	Analytical Chemistry/Lab .....	4
CHM	3400C	Basic Physical Chemistry .....	4
CHM	4611	Inorganic Chemistry .....	4
MAC	2311	Analytic Geometry and Calculus I.....	4
MAC	2312	Analytic Geometry and Calculus II.....	4
Advisor approved 3000/4000 level course .....			3-4

*Choose one option:*

*Option 1:*

PHY	2048/L	University Physics I/Lab.....	4
PHY	2049/L	University Physics II/Lab.....	4

*Option 2:*

PHY	2053/L	General Physics I/Lab.....	4
PHY	2054/L	General Physics II/Lab.....	4