

# CHEMISTRY NON-ACS CERTIFIED MAJOR

Department of Chemistry (<https://catalog.washcoll.edu/catalog/departments-programs/chemistry/>)  
Division of Natural Sciences and Mathematics

The non ACS-certified major provides a pathway to be a chemistry major that gives more flexibility in the course of study compared to the ACS-certified major. There are fewer foundational classes, a biochemistry course is not required, and one can choose to take non-calculus based Physics. In addition, one of the in-depth courses can be a course offered in another science department (see requirements).

This major works well for students who are interested in applied chemistry or teaching, as well as for those who want to double major.

## Chemistry Non-ACS Certified Major Requirements

Code	Title	Credits	Notes
CHE 120 & CHE 122	Chem Principles Org Molecules with Lab and Chemical Principles Orgnc Molecules Lab	4	_____
CHE 140 & CHE 142	Reactions of Organic Molecules with Lab and Reactions of Organic Molecules Lab	4	_____
CHE 220 & CHE 222	Quantitative Chemical Analysis with Lab and Quantitative Chemical Analysis Lab	4	_____
CHE 240 & CHE 242	Chemistry of the Elements with Lab and Chemisty of the Elements Lab	4	_____
CHE 305  or CHE 306	Chemical Thermodynamics/Kinetics w/Lab Quantum Chem & Spectro with Lab	4	_____
CHE 340	Synthesis of Organic Molecules with Lab	4	_____
CHE 392	Junior Seminar	2	_____
CHE 200, 300, 400 level <sup>1</sup>		4	_____
CHE 200, 300, 400 level		4	_____
CHE 200, 300, 400 level		4	_____
MAT 111	Differential Calculus	4	_____
MAT 112	Integral Calculus	4	_____
PHY 101 or PHY 111	College Physics I with Lab General Physics I with Lab	4	_____
PHY 102 or PHY 112	College Physics II with Lab General Physics II with Lab	4	_____
<b>CHE SCE</b>	<b>Senior Capstone Experience</b>	<b>4</b>	_____
<b>Total Credits</b>		<b>58</b>	_____

<sup>1</sup> One of the three elective courses for the nonACS-certified degree may be a BIO, ENV or PHY course not counted towards that major.

## Distribution Courses

For distribution credit in Natural Sciences, the Chemistry department offers CHE 110 Chemistry of the Environment with Lab, CHE 120 Chem Principles Org Molecules with Lab, CHE 140 Reactions of Organic Molecules with Lab, CHE 220 Quantitative Chemical Analysis with Lab, and CHE 235 Art in the Anthropocene.

## Advanced Placement Credit

Students who earn a 3 or 4 on the Advanced Placement exam in Chemistry will earn credit for CHE 194 Special Topics. Students who earn a 5 on the Advanced Placement exam in Chemistry will earn credit for CHE 194 Special Topics and CHE 220 Quantitative Chemical Analysis with Lab. Regardless

of a student's score on the AP exam, they should begin their study of chemistry at Washington College with CHE 120 Chem Principles Org Molecules with Lab.

## Transfer Credit

Students transferring to the College with:

- General Chemistry I receive credit for CHE 194 Special Topics
- General Chemistry II receive credit for CHE 220 Quantitative Chemical Analysis with Lab
- Organic Chemistry I and II receive credit for CHE 120 Chem Principles Org Molecules with Lab and CHE 140 Reactions of Organic Molecules with Lab

It is not recommended to seek to take introductory chemistry courses away from Washington College. In exceptional circumstances, students may seek prior approval from the Chair of the Department for permission to take and transfer in such courses.

Students may specialize within a subdiscipline of chemistry or a chemistry-related cross-disciplinary or multidisciplinary area to complete an area of emphasis within the ACS certified or non-ACS certified chemistry majors. Each area of emphasis requires students to complete three 4-credit courses and their SCE in the selected area. Students pursuing the ACS certified option are only be able to count the CHE courses listed for each area of emphasis towards their major. Students who do not choose an area of emphasis, may complete the SCE with any professor of their choice on any topic.

Chemistry Emphases are listed the transcript. A student may only complete one area of emphasis.

### Organic and Medicinal Chemistry Emphasis

This emphasis is for students pursuing graduate study or careers in organic chemistry, medicinal chemistry, or pharmacology. Students gain a strong foundation in organic synthesis and mechanisms, while broadening their knowledge in areas such as drug discovery and pharmacology.

Code	Title	Credits	Notes
<b>SCE specialization in Organic or Medicinal Chemistry</b>			
<b>Select 3 of the following:</b>		<b>12</b>	
CHE 303	Chem of Biological Compounds with Lab		
or CHE 309	Biochemistry with Lab		
CHE 320	Introduction to Medicinal Chemistry		
CHE 403	Advanced Organic Chemistry with Lab		
PSY 205	Drugs & Behavior		
or PSY 305	Psychopharmacology with Lab		
Approved Special Topics Course or Research Experience <sup>1</sup>			

<sup>1</sup> CHE 394 Special Topics/CHE 494 Special Topics or CHE 395 On-Campus Guided Research/CHE 495 On-Campus Guided Research/CHE 396 Off-Campus Research/CHE 496 Off-Campus Research

### Greener Materials Science Emphasis

This emphasis provides a thorough grounding in the basic sciences and engineering of all materials while being exposed to ways to prevent pollution before it is created (Green Chemistry). Students are prepared for graduate study, bench research, consultantships dealing with the production, structure, characterization, properties, and applications of metals, ceramics, polymers, composites, nano- and bio-compatible and electronic materials. Additionally, future chemists and engineers are provided the tools required to minimize the environmental impact of materials production.

Code	Title	Credits	Notes
<b>SCE specialization in Greener Materials Science</b>			
<b>Select 3 of the following:</b>		<b>12</b>	
CHE 235	Art in the Anthropocene		
CHE 310	Greener & Sustainable Chemistry		
CHE 410	Fundamentals of Materials Science		
Approved Special Topics Course or Research Experience <sup>1</sup>			

<sup>1</sup> CHE 394 Special Topics/CHE 494 Special Topics or CHE 395 On-Campus Guided Research/CHE 495 On-Campus Guided Research/CHE 396 Off-Campus Research/CHE 496 Off-Campus Research

## Physical Chemistry Emphasis

This emphasis is for students interested in the physical aspects of chemistry. Students are prepared for graduate school or careers that require a stronger foundation in theoretical or physical areas of chemistry.

Code	Title	Credits	Notes
<b>SCE specialization in Physical Chemistry</b>			
Select 3 of the following:		12	
CHE 305 & CHE 306	Chemical Thermodynamics/Kinetics w/Lab and Quantum Chem & Spectro with Lab		
Approved PHY elective at the 200-level or above			
MAT 210	Multivariable Calculus		
Approved Special Topics Course or Research Experience <sup>1</sup>			

<sup>1</sup> CHE 394 Special Topics/CHE 494 Special Topics or CHE 395 On-Campus Guided Research/CHE 495 On-Campus Guided Research/CHE 396 Off-Campus Research/CHE 496 Off-Campus Research

## Biological Chemistry

This emphasis is for students interested in pursuing graduate study or a career in biological chemistry, chemical biology, pharmacology, or related fields. Students gain a strong background in biomolecular structure and dynamics, techniques utilized in biochemical characterization of biomolecules, and principles of effective drug design.

Code	Title	Credits	Notes
<b>SCE specialization in Biological Chemistry</b>			
Select 3 of the following:		12	
CHE 303	Chem of Biological Compounds with Lab		
CHE 309	Biochemistry with Lab		
CHE 320	Introduction to Medicinal Chemistry		
CHE 305 & CHE 306	Chemical Thermodynamics/Kinetics w/Lab and Quantum Chem & Spectro with Lab		
BIO category II elective at 200-level or above			
Approved Special Topics Course or Research Experience <sup>1</sup>			

<sup>1</sup> CHE 394 Special Topics/CHE 494 Special Topics or CHE 395 On-Campus Guided Research/CHE 495 On-Campus Guided Research/CHE 396 Off-Campus Research/CHE 496 Off-Campus Research

### Major

- Biochemistry and Molecular Biology Major (<https://catalog.washcoll.edu/catalog/interdisciplinary/biochemistry-molecular-biology-major/>)
- Chemistry ACS-certified Major (<https://catalog.washcoll.edu/catalog/departments-programs/chemistry/chemistry-acs-certified-major/>)
- Chemistry Non-ACS certified Major (p. 1)

### Minor

- Chemistry Minor (<https://catalog.washcoll.edu/catalog/departments-programs/chemistry/chemistry-minor/>)

### Certificate

- Secondary Education Certification Program (<https://catalog.washcoll.edu/catalog/departments-programs/education/secondary-education-certification-program/>)