CHEMISTRY

The majors offered by the Department of Chemistry prepare students to enter the chemical industry or graduate school and provide an excellent foundation for professional studies in medicine, forensics, law, and other areas. Students interested in chemistry and secondary education are encouraged to consider the five-year combined B.S./M.Ed. program.

Majors

- **B.S.** in **Biochemistry**—modern studies at the interface of chemistry and biology, also an excellent pathway for pre-med
- **B.S.** in **Chemistry**—classic and innovative development of theory and laboratory skills
- **B.S.** in **Chemistry-Business**—practical training in business skills and technical knowledge, can be combined with an accelerated MBA Track
- **B.A.** in **Biochemical Studies**—optimal pathway for pre-pharmacy, including partnerships with Temple and Howard universities
- **4+1** Track in **Forensic Chemistry**—accelerated B.S./P.S.M. with Temple University
- **4+1** Tracks in **Biotechnology, Bioinformatics,** and **Bioinnovation**

Mission

Through rigorous studies of chemical principles, hands-on laboratory analysis and original research, we cultivate students for advancement in their fields by equipping each with tools to be careful thinkers, creative problem solvers, clear communicators, and skilled experimentalists. We examine the handiwork of God — the display of His glory evident in the molecular complexity of the natural world — so students called to science can lead meaningful lives of service as effective stewards and agents of God's redemptive purposes.

The Major for the B.S. in Biochemistry

Accredited by the American Society for Biochemistry and Molecular Biology (ASBMB)

Code	Title	Credit Hours
CHEM 121 & CHEM 123	General Chemistry I and General Chemistry Laboratory I	4
CHEM 122 & CHEM 124W	General Chemistry II and General Chemistry Laboratory II	4
CHEM 211 & CHEM 213W	Organic Chemistry I and Organic Chemistry Laboratory I: Techniques	4
CHEM 212 & CHEM 214	Organic Chemistry II and Organic Chemistry Laboratory II: Reactions	4
CHEM 320 & CHEM 322	Biochemistry I and Biochemistry Laboratory	4
CHEM 321	Biochemistry II	3
CHEM 390	Thermodynamics & Kinetics	4
CHEM 420 or CHEM 495	Chemical Research Internship	5
CHEM 425W	Project Presentation	1
CHEM 450	Chemistry Seminar	1
BIOL 311	Cell Biology	4
BIOL 344 & BIOL 345	Molecular Biology and Molecular Biology Laboratory	4
Select one of the following:		3-4
BIOL 310	Animal Physiology	
BIOL 312	Genetics	
CHEM 341	Structural Basis of Human Disease	
CHEM 360	Advanced Organic Chemistry	
CHEM 380	Instrumental Analysis	
PHYS 151	Introduction to University Physics (Calculus-Based)	4
PHYS 152	Introduction to University Physics (Calculus-Based)	4
MATH 160	Calculus I	3
Total Credit Hours		**56-57**

Recommended schedule:

Course	Title	Credit Hours
First Year		
CHEM 100	Chemical Foundations [optional]	2
CHEM 121	General Chemistry I	3
CHEM 122	General Chemistry II	3
CHEM 123	General Chemistry Laboratory I	1
CHEM 124W	General Chemistry Laboratory II	1
BIOL 152	General Biology II [optional]	4
MATH 160	Calculus I	3
	Credit Hours	**17**
Sophomore Year		
CHEM 195	Preparation for Organic Chemistry [optional]	1
CHEM 211	Organic Chemistry I	3
CHEM 212	Organic Chemistry II	3
CHEM 213W	Organic Chemistry Laboratory I: Techniques	1
CHEM 214	Organic Chemistry Laboratory II: Reactions	1
Select one of the following:		8
PHYS 151 & PHYS 152	Introduction to University Physics (Calculus-Based) and Introduction to University Physics (Calculus-Based)	
BIOL 311 & BIOL 344	Cell Biology and Molecular Biology	
	Credit Hours	**17**
	Total Credit Hours	**34**

The Major for the B.S. in Chemistry

Code	Title	Credit Hours
CHEM 121 & CHEM 123	General Chemistry I and General Chemistry Laboratory I	4
CHEM 122 & CHEM 124W	General Chemistry II and General Chemistry Laboratory II	4
CHEM 211 & CHEM 213W	Organic Chemistry I and Organic Chemistry Laboratory I: Techniques	4
CHEM 212 & CHEM 214	Organic Chemistry II and Organic Chemistry Laboratory II: Reactions	4
CHEM 231	Quantitative Analysis	4
CHEM 380	Instrumental Analysis	4
CHEM 390	Thermodynamics & Kinetics	4
CHEM 411	Quantum Chemistry	4

CHEM 420	Chemical Research	5
or CHEM 495	Internship	
CHEM 425W	Project Presentation	1
CHEM 450	Chemistry Seminar	1
Select one of the following:		3-4
CHEM 320 & CHEM 322	Biochemistry I and Biochemistry Laboratory	
CHEM 350	Advanced Inorganic Chemistry	
CHEM 360	Advanced Organic Chemistry	
CHEM 105 & CHEM 304	Introduction to Forensic Chemistry and Chemistry Laboratory Management	
MATH 161	Calculus II	3
PHYS 151	Introduction to University Physics (Calculus-Based)	4
PHYS 152	Introduction to University Physics (Calculus-Based)	4
Total Credit Hours		**53-54**

Recommended for Graduate School preparation:

Code	Title	Credit Hours
CHEM 350	Advanced Inorganic Chemistry	3
CHEM 360	Advanced Organic Chemistry	3
MATH 300	Differential Equations	3

Recommended for work in industry:

Code	Title	Credit Hours
CHEM 360	Advanced Organic Chemistry	3
CHEM 304	Chemistry Laboratory Management	1
BUSA course		3

Required for Secondary Certification:

Code	Title	Credit Hours
CHEM 304	Chemistry Laboratory Management	1

Recommended Schedule:

Course	Title	Credit Hours
First Year		
CHEM 100	Chemical Foundations [optional]	2
CHEM 121	General Chemistry I	3
CHEM 122	General Chemistry II	3
CHEM 123	General Chemistry Laboratory I	1
CHEM 124W	General Chemistry Laboratory II	1
MATH 161	Calculus II [1]	3
	Credit Hours	**13**
Sophomore Year		
CHEM 195	Preparation for Organic Chemistry [optional]	1
CHEM 211	Organic Chemistry I	3
CHEM 212	Organic Chemistry II	3
CHEM 213W	Organic Chemistry Laboratory I: Techniques	1
CHEM 214	Organic Chemistry Laboratory II: Reactions	1
PHYS 151	Introduction to University Physics (Calculus-Based)	4
PHYS 152	Introduction to University Physics (Calculus-Based)	4
MATH 161	Calculus II	3
	Credit Hours	**20**
	Total Credit Hours	**33**

[1] MATH 160 Calculus I if no previous background in calculus

The Major for the B.S. in Chemistry-Business

Code	Title	Credit Hours
CHEM 121 & CHEM 123	General Chemistry I and General Chemistry Laboratory I	4
CHEM 122 & CHEM 124W	General Chemistry II and General Chemistry Laboratory II	4
CHEM 211 & CHEM 213W	Organic Chemistry I and Organic Chemistry Laboratory I: Techniques	4
CHEM 212 & CHEM 214	Organic Chemistry II and Organic Chemistry Laboratory II: Reactions	4
Select one of the following:		4
CHEM 231	Quantitative Analysis	
CHEM 320 & CHEM 322	Biochemistry I and Biochemistry Laboratory	
CHEM 304	Chemistry Laboratory Management	1
CHEM 380	Instrumental Analysis	4
CHEM 450	Chemistry Seminar	1
ACCT 210	Accounting Fundamentals	3
MKTG 202	Principles of Marketing	3
BUSA 221	Business Statistics	3
Select one of the following:		3
MKTG 305	Principles of Sales Management	
BUSA 321	Operations Management	
BUSA 340	Human Resources Management	
BUSA 311W	Business Ethics and Leadership	3
BUSA 350	Business Law	3
BUSA 480	Business Strategy and Policy	3
ECON 203	Macroeconomics	3
FINA 350	Finance for Managers	3
Select one of the following:		3-4
BUSA 495	Internship	
CHEM 495 & CHEM 425W	Internship and Project Presentation	
CHEM 420 & CHEM 425W	Chemical Research and Project Presentation	
Total Credit Hours		**56-57**

Recommended Schedule:

Chemistry sequence can be started in first or second year with CHEM 100 Chemical Foundations (optional in summer), CHEM 121 General Chemistry I/CHEM 123 General Chemistry Laboratory I. Business sequence begins with ACCT 210 Accounting Fundamentals.

The Major for the B.A. in Biochemical Studies

Code	Title	Credit Hours
CHEM 121 & CHEM 123	General Chemistry I and General Chemistry Laboratory I	4
CHEM 122 & CHEM 124W	General Chemistry II and General Chemistry Laboratory II	4
CHEM 211 & CHEM 213W	Organic Chemistry I and Organic Chemistry Laboratory I: Techniques	4
CHEM 212 & CHEM 214	Organic Chemistry II and Organic Chemistry Laboratory II: Reactions	4
CHEM 320 & CHEM 322	Biochemistry I and Biochemistry Laboratory	4
CHEM 321	Biochemistry II	3
CHEM 450	Chemistry Seminar	1
CHEM 495	Internship	3
CHEM 425W	Project Presentation	1
BIOL 152 & 152L	General Biology II and General Biology II Laboratory	4
BIOL 216 & 216L	Introduction to Microbiology and Introduction to Microbiology Laboratory	4
BIOL 233 & 233L	Human Physiology & Anatomy I and Human Physiology & Anatomy I Lab	4
BIOL 234 & 234L	Human Physiology & Anatomy II and Human Physiology and Anatomy II Laboratory	4
BIOL 311 & 311L	Cell Biology and Cell Biology Lab	4
MATH 160	Calculus I	3
PHYS 151	Introduction to University Physics (Calculus-Based)	4
PHYS 152	Introduction to University Physics (Calculus-Based)	4
MATH 220	Elementary Statistics	3
Total Credit Hours		**62**

Recommended Schedule:

First-Year: CHEM 100 Chemical Foundations (optional in summer), CHEM 121 General Chemistry I/CHEM 123 General Chemistry Laboratory I in Fall, and then CHEM 122 General Chemistry II/CHEM 124W General Chemistry II Laboratory, and BIOL 152 General Biology II in Spring.

Biochemistry Minor

Code	Title	Credit Hours
CHEM 122 & CHEM 124W	General Chemistry II and General Chemistry Laboratory II	4
CHEM 211 & CHEM 213W	Organic Chemistry I and Organic Chemistry Laboratory I: Techniques	4
CHEM 212 & CHEM 214	Organic Chemistry II and Organic Chemistry Laboratory II: Reactions	4
CHEM 320 & CHEM 322	Biochemistry I and Biochemistry Laboratory	4
CHEM 321	Biochemistry II	3
Total Credit Hours		**19**

Chemistry Minor

Code	Title	Credit Hours
CHEM 121 & CHEM 123	General Chemistry I and General Chemistry Laboratory I	4
CHEM 122 & CHEM 124W	General Chemistry II and General Chemistry Laboratory II	4
CHEM 211 & CHEM 213W	Organic Chemistry I and Organic Chemistry Laboratory I: Techniques	4
CHEM 212 & CHEM 214	Organic Chemistry II and Organic Chemistry Laboratory II: Reactions	4
Select one of the following:		3
CHEM 231	Quantitative Analysis	
CHEM 350	Advanced Inorganic Chemistry	
CHEM 360	Advanced Organic Chemistry	
CHEM 380	Instrumental Analysis	
CHEM 390	Thermodynamics & Kinetics	
CHEM 408	Industrial Chemistry	
CHEM 411	Quantum Chemistry	
CHEM 420	Chemical Research	
Total Credit Hours		**19**

Forensic Chemistry Minor

Code	Title	Credit Hours
CHEM 105	Introduction to Forensic Chemistry	3
CHEM 121 & CHEM 123	General Chemistry I and General Chemistry Laboratory I	4
CHEM 122 & CHEM 124W	General Chemistry II and General Chemistry Laboratory II	4
CHEM 211 & CHEM 213W	Organic Chemistry I and Organic Chemistry Laboratory I: Techniques	4
BIOL 316	Techniques in Biotechnology	3
Total Credit Hours		**18**

Forensic Chemistry 4+1 Track

The 4+1 forensic chemistry accelerated track leads to a B.S. in Chemistry or Biochemistry from Eastern University followed by a Professional Science Masters (PSM) degree in Forensic Chemistry from Temple University. Graduate coursework begins in the fall of junior year at Eastern. Students take one Temple graduate course per semester until the end of senior year so that an entire year of graduate studies is completed concurrent with the undergraduate degree. Students who meet the requirements are guaranteed admission to Temple following graduation from Eastern to complete the PSM degree in one additional year. The year of full-time graduate studies at Temple includes a professional internship.

Professional Science Tracks

Students majoring in B.S. Biochemistry can pursue a 4+1 track leading to a Professional Science Masters (PSM) degree from Temple University in any of the following growth areas: Biotechnology, Bioinformatics,

Bioinnovation or Scientific Writing. Graduate coursework begins in the fall of junior year at Eastern.