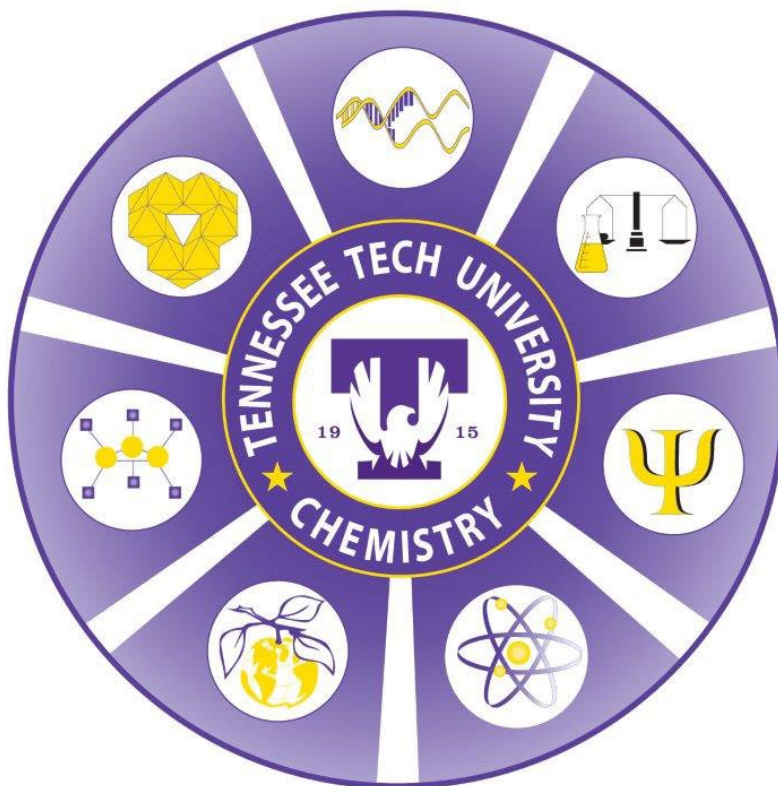


# Undergraduate Programs of Study



**Department of Chemistry**

**Tennessee Tech University**

**Fall 2023**

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# Chemistry Advisors



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## Undergraduate Degree Programs

Chemistry students have a variety of goals for their future. Some wish to prepare for graduate study and future research careers, while others plan to seek immediate employment or advanced study in other scientific or technical fields. Recognizing this, we offer eight concentration areas leading to the bachelor of science degree in chemistry:

<p><b><u>Pure Chemistry</u></b> B.S. in chemistry for students preparing for a career as a professional chemist, including preparation for graduate study in chemistry. The curriculum focuses on chemistry, mathematics and physics. This curriculum exceeds the standards for certification set by the American Chemical Society.</p>	<p><b><u>Biochemistry</u></b> B.S. in chemistry for students whose interests lie in careers at the biology/chemistry interface. This curriculum is designed to prepare for graduate study in biochemistry or a related field. It is also often preferred by students pursuing a pre-health program.</p>
<p><b><u>Environmental Chemistry</u></b> B.S. in chemistry for students interested in the study of chemical and biochemical phenomena in natural places. It is an interdisciplinary field that includes atmospheric, aquatic and soil chemistry. Opportunities in this area include entry-level positions as well as graduate study.</p>	<p><b><u>Forensic Chemistry</u></b> B.S. in chemistry for students interested in the application of chemistry in a legal or criminal setting. A forensic chemist can assist in the identification of unknown materials found at a crime scene. Opportunities are available in government or private laboratories, or in graduate study.</p>
<p><b><u>Health Science Chemistry</u></b> B.S. in chemistry for students pursuing pre-health career studies. This curriculum meets the requirements for entry into professional school programs in medicine, dentistry, pharmacy or optometry. A "3+1" option is available for pharmacy or med tech career track students.</p>	<p><b><u>Business Chemistry</u></b> B.S. in chemistry for students interested in an entry-level position as a chemist in industry. However, it includes the equivalent of a minor in business for the student that may seek a later management position.</p>
<p><b><u>Industrial Chemistry</u></b> B.S. in chemistry for students interested in an entry-level position as a chemist in industry. This curriculum focuses more on the necessary skills for success in a laboratory environment.</p>	<p><b><u>Custom Chemistry</u></b> B.S. in chemistry that lies outside of the preceding established fields. A student, with the aid of their advisor, can construct a personalized program of study. Examples of past such curricula include food science or cosmetic chemistry.</p>
<p><b><u>A.C.S. Certification</u></b> A student in any chemistry concentration may attain certification by the American Chemical Society as determined by the chemistry faculty. The Department of Chemistry defines specific areas of ACS certification including, but not restricted to, Pure Chemistry, Biochemistry, Environmental Chemistry, Health Science Chemistry and Forensic Chemistry. While Pure Chemistry exceeds these requirements, certification requirements for all other areas are above and beyond the curricular requirements of the concentrations.</p>	

# Student Organizations in the Chemistry Department

## Student Members of the American Chemical Society (SMACS)

Do you love chemistry? Learn why chemistry is called the central science, how you can get involved in undergraduate research and get to know others who share your love of chemistry. The ACS student members are not only a cohesive group of chemistry majors, but we have members from all different majors across campus. We are group active in outreach because we want to inspire others to see the value chemistry brings to their lives. As a member of SMACS, you'll also have the opportunity to become a national member of the ACS, the largest organization in the world dedicated to a single discipline. National members receive a subscription of the weekly magazine, Chemical and Engineering News. Our chapter is ranked as an Outstanding chapter which places us in the top level of student chapters both domestically and internationally. We achieve this awards status due to our number, diversity and quality of outreach, professional development and social activities. The many other benefits of membership (as well as a lot of great chemistry resources) can be found at the **ACS** website

<https://www.acs.org/content/acs/en/education/students/college/studentaffiliates.html>).

Contact **Dr. Amanda Carroll** ([acarroll@tntech.edu](mailto:acarroll@tntech.edu)) or check out the SMACS Facebook page (<https://www.facebook.com/groups/SMACSTTU/>) for more information.

## Student Chapter of the American Society of Biochemistry and Molecular Biology (ASBMB)

Are you interested in the cross-disciplinary field of biochemistry and molecular biology? If so, then this club may be just for you! The ASBMB is a club that brings together students in chemistry, chemical engineering, biology and any other majors with interests in the molecular biosciences. Local and regional speakers provide career advisement through the presentation of symposia, the offering of plant tours and academic curricular decision-making. Plus, it brings students together with similar interests and career goals. Student affiliates receive an online subscription to the Journal of Biological Chemistry and many more opportunities as an ASBMB member. More information can be found at the **ASBMB** website (<https://www.asbmb.org/>).

Contact **Dr. Derek Cashman** ([dcashman@tntech.edu](mailto:dcashman@tntech.edu)) for more information. Or you may go to the Tennessee Tech Student Affiliates ASBMB Facebook site (<https://www.facebook.com/ttuasbmb/>).

## Chemical-Medical Sciences Club

Are you interested in a professional career in health sciences? Do you aspire to become a physician, a dentist or dental hygienist, an optometrist or pharmacist or one of many other medical professionals? If this is your goal, then you simply must be a member of the Chem-Med Club. This club puts you in touch with the professionals you need to know if you are interested in a professional career. Medical professionals visit the Chem-Med Club meetings and share the ins and outs of their profession and help you understand what it takes to be successful, and what it takes to get into a professional graduate program as well! The club meets every first and third Tuesday of the month at 11 a.m. in the Lab Science Commons Room 126. Contact **Ms. Ann Marie Carrick** ([acarrick@tntech.edu](mailto:acarrick@tntech.edu)) for more information.

# 41-Hour General Education Core

## Communication – 9 hours

### **6 hours in English composition**

ENGL 1010	English Composition I	3
ENGL 1020	English Composition II	3

### **3 hours in English oral presentational communication**

COMM 2025	Fundamentals of Communication	3
PC 2500	Communicating in the Professions	3

## Mathematics – 3 hours

MATH 1010	Math for General Studies	3
MATH 1420	Geometry Concepts for Teachers	3
MATH 1530	Introductory Statistics	3
MATH 1630	Finite Mathematics	3
MATH 1710	Pre-Calculus Algebra	3
MATH 1720	Pre-Calculus Trigonometry	3
MATH 1730	Pre-Calculus Mathematics	5
MATH 1830	Applied Calculus	3
MATH 1910	Calculus I	4

## History – 6 hours

HIST 2010	Early United States History	3
HIST 2020	Modern United States History	3

## Humanities and/or Fine Arts – 9 hours

**At least one literature course, selected from those marked with an asterisk (\*) must be included in the 9 hours**

ART 1035	Introduction to Art	3
ART 2000	Art History Survey I	3
ART 2020	Art History Survey II	3
*ENGL 2130	Topics in American Literature	3
*ENGL 2235	Topics in British Literature	3
*ENGL 2330	Topics in World Literature	3
FLST 2520 (3520)	The Cultures and Peoples of North Africa	3
FREN 2510	French Culture and Civilization	3
GERM 2520	German Culture and Civilization	3
HIST 2210	Early Western Civilization	3
HIST 2220	Modern Western Civilization	3
HIST 2310	Early World History	3
HIST 2320	Modern World History	3
HIST 1310	Science and World Cultures	3
MUS 1030	Music Appreciation	3
PHIL1030	Introduction to Philosophy	3

RELS 2010	Introduction to Religious Studies	3
SPAN 2510	Spanish Culture and Civilization	3
SPAN 2550	Latin American Culture and Civilization	3
THEA 1030	Introduction to Theater	3

**Social/Behavioral Sciences – 6 hours**

AGBE 2010	World Food and Society	3
ANTH 1100	Introduction to Anthropology	3
ECON 2010	Microeconomics	3
ECON 2020	Macroeconomics	3
ESS 1100	Introduction to Environmental Studies	3
EXPW 2015	Concepts of Health and Wellness	3
GEOG 1012	Cultural Geography	3
GEOG 1130	Geography of Natural Hazards	3
JOUR 1110	Media and Social Institutions	3
POLS 1030	American Government	3
PSY 1030	Introduction to Psychology	3
SOC 1010	Introduction to Sociology	3
WGS 2010	Women and Gender Studies	3

**Natural Sciences – 8 hours**

ASTR 1010	Introduction to Modern Astronomy I	4
ASTR 1020	Introduction to Modern Astronomy II	4
BIOL 1010	Introduction to Biology	4
BIOL 1020	Diversity of Life	4
BIOL 1080	Concepts of Biology	3
BIOL 1113	General Biology I	4
BIOL 1123	General Biology II	4
BIOL 2010	Human Anatomy and Physiology I	4
BIOL 2020	Human Anatomy and Physiology II	4
BIOL 2310	General Botany	4
CHEM 1010	Introductory Chemistry I	4
CHEM 1020	Introductory Chemistry II	4
CHEM 1110	General Chemistry I	4
CHEM 1120	General Chemistry II	4
CHEM 1310	Concepts of Chemistry	3
GEOG 2100	Weather and Climate Systems	4
GEOL 1040	Physical Geology	4
GEOL 1045	Earth, Environment, Resources and Society	4
GEOL 1070	Concepts of Geology	3
PHYS 1310	Concepts of Physics	3
PHYS 2010	Algebra-based Physics I	4
PHYS 2020	Algebra-based Physics II	4
PHYS 2110	Calculus-based Physics I	4
PHYS 2120	Calculus-based Physics II	4

High School GPA of 3.6 = 19 ACT

### TENNESSEE TECH MATH PLACEMENT by Tenn. Tech Mathematics Department

ACT Math	OLD SAT Math Before 3/2016	NEW SAT Math	DSPM	Next Gen. ACCUPLACER Test		Course
				QAS (C34)	AAF (C35)	
<15	<350	<380	1	≤224	N/A	Receive Tutoring/Retest
15-16	350-390	380-450	2	225-237	N/A	L section 1010, 1530, 1710
17-18	400-450	460-500	3	238-249	N/A	L section 1010, 1530, 1710
SAILS (May need permit.)	N/A	N/A	4	N/A	N/A	Equiv. to ACT 19 1010, 1410, 1530, 1630, 1710
19	460-470	510	4	250-300	N/A	1010, 1410, 1530, 1630, 1710
<b>Branch to AAF at QAS score of 255</b>				<b>≤230</b>	<b>Place by QAS Score</b>	
22 or SAILS+	520-530	540	N/A	N/A	231-250	1720
25	570-580	590-600	N/A	N/A	251-259	1730, 1830, 1845
27+	610+	630+	N/A	N/A	260-300	1910

**QAS** – Quantitative Reasoning, Algebra, and Statistics

**AAF** - Advanced Algebra and Function

Revised 2-14-2022





## Bachelor of Science, Chemistry Major Pure Chemistry Concentration

<b>CHEMISTRY</b> (56 hrs)	
1110 General Chemistry I	4
1120 General Chemistry II	4
1500 First-Year Interactions	1
2010 Intro Inorganic Chem	3
2910 Undergr. Research Methods	1
3010 Organic Chemistry I	4
3020 Organic Chemistry II	4
3410 Quantitative Analysis	4
3510 Physical Chemistry I	4
3520 Physical Chemistry II	4
4110 Inorganic Chemistry	3
4150 Inorganic Laboratory	1
4210 Chemistry of Polymers	3
4520 Instrumental Analysis	4
4610 General Biochemistry I	3
4910 Chemistry Seminar	2
4991 Undergraduate Research	1
Advanced Chemistry Courses	6
<b>MATHEMATICS</b> (14-15 hrs)	
1910 Calculus I	4
1920 Calculus II	4
2110 Calculus III	4
Elective	2-3

<b>PHYSICS</b> (8 hrs)	
2110 Calculus-Based Physics I	4
2120 Calculus-Based Physics II	4

<b>ENGLISH</b> (6 hrs)	
1010 English Composition I	3
1020 English Composition II	3

<b>HUMANITIES</b> (9 hrs)	
Literature	3
	3
	3

<b>HISTORY</b> (6 hrs)	
2010 Early US History	3
2020 Modern US History	3

<b>COMMUNICATION</b> (3 hrs)	
	3

<b>Social Science</b> (6 hrs)	
	3
	3

<b>ELECTIVES</b> (11-12 hrs)	
<b>TOTAL</b>	120

## Bachelor of Science, Chemistry Major Pure Chemistry Concentration

<b>FRESHMAN YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	1110,1120	General Chemistry I,II	8
CHEM	1500	First-Year Connections/Advisement	1
MATH	1910,1920	Calculus I,II	8
ENGL	1010,1020	English Composition I,II	6
SS	-----	Social Science (Gen Ed)	6
<b>TOTAL</b>			29
<b>SOPHOMORE YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	2010	Introduction to Inorganic Chemistry	3
CHEM	2910	Undergraduate Research Methods	1
CHEM	3010,3020	Organic Chemistry I,II	8
MATH	2110	Calculus III	4
MATH	-----	Mathematics Elective*	3
PHYS	2110,2120	Calculus-Based Physics I,II	8
HUM	-----	Humanities (Gen Ed)	6
<b>TOTAL</b>			33
<b>JUNIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	3410	Quantitative Analysis	4
CHEM	3510,3520	Physical Chemistry I,II	8
HIST	2010,2020	Early and Modern US History	6
COM	-----	Communication (Gen Ed)	3
HUM	-----	Humanities (Gen Ed)	3
ELEC	-----	Electives	5
<b>TOTAL</b>			29
<b>SENIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	4110,4150	Inorganic Chemistry & Laboratory	4
CHEM	4210	Chemistry of Polymers	3
CHEM	4520	Instrumental Analysis	4
CHEM	4610	General Biochemistry	3
CHEM	4910	Chemistry Seminar	2
CHEM	4991	Undergraduate Research	1
CHEM	-----	Chemistry Electives**	6
ELEC	-----	Electives	6
<b>TOTAL</b>			29
*Chosen from MATH 2010,2120,3070 or PHYS 2920.			
**Chosen from CHEM 4310,4320,4410,4620,4650,4710,4720.			

## Bachelor of Science, Chemistry Major Biochemistry Concentration

<b>CHEMISTRY</b> (37 hrs)		
1110	General Chemistry I	4
1120	General Chemistry II	4
1500	First-Year Connections	1
3010	Organic Chemistry I	4
3020	Organic Chemistry II	4
3410	Quantitative Analysis	4
3420	Analytical Applications	3
3500	Elements of Physical Chem.	3
4610	General Biochemistry I	3
4620	General Biochemistry II	3
4650	Biochemistry Lab	2
4910	Chemistry Seminar	2

<b>BIOLOGY</b> (26 hrs)		
1113	General Biology I	4
1123	General Biology II	4
3140	Cell Biology	4
3230	Microbiology	4
3810	General Genetics	4
4150	Molecular Genetics	3
4040 or 4060		3

<b>MATHEMATICS</b> (7 hrs)		
1910	Calculus I	4
3070	Statistical Methods	3

<b>PHYSICS</b> (8 hrs)		
2010	Algebra-Based Physics I	4
2020	Algebra-Based Physics II	4

<b>ENGLISH</b> (6 hrs)		
1010	English Composition I	3
1020	English Composition II	3

<b>HUMANITIES</b> (9 hrs)		
	Literature	3
		3
		3

<b>HISTORY</b> (6 hrs)		
2010	Early US History	3
2020	Modern US History	3

<b>SOCIAL SCIENCE</b> (6 hrs)		
		3
		3

<b>COMMUNICATION</b> (3 hrs)		
		3

<b>ELECTIVES</b> (12 hrs)		
<b>TOTAL</b>		120

## Bachelor of Science, Chemistry Major Biochemistry Concentration

<b>FRESHMAN YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	1110,1120	General Chemistry I,II	8
CHEM	1500	First-Year Connections/Advisement	1
BIOL	1113,1123	General Biology I,II	8
MATH	1910	Calculus I	4
ENGL	1010,1020	English Composition I,II	6
SS	-----	Social Science (Gen Ed)	3
		<b>TOTAL</b>	30
<b>SOPHOMORE YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	3410,3420	Quant. Analysis, Analytical Appl'ns	7
BIOL	3810	General Genetics	4
BIOL	3230	Health Science Microbiology	4
PHYS	2010,2020	Algebra-Based Physics I,II	8
HUM	-----	Humanities (Gen Ed)	6
SS	-----	Social Science (Gen Ed)	3
		<b>TOTAL</b>	32
<b>JUNIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	3010,3020	Organic Chemistry I,II	8
CHEM	3500	Elements of Physical Chemistry	3
BIOL	3140	Cell Biology	4
HIST	2010,2020	Early and Modern US History	6
COM	-----	Communication (Gen Ed)	3
HUM	-----	Humanities (Gen Ed)	3
ELEC	-----	Elective	3
		<b>TOTAL</b>	30
<b>SENIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	4610,4620	General Biochemistry	6
CHEM	4650	Biochemistry Laboratory	2
CHEM	4910	Chemistry Seminar	2
BIOL	4150	Molecular Genetics	3
BIOL	4040 or 4060	Immunology or Hormones	3
MATH	3070	Statistical Methods I	3
ELEC	-----	Electives	9
		<b>TOTAL</b>	28

## Bachelor of Science, Chemistry Major Environmental Chemistry Concentration

<b>CHEMISTRY</b> (42 hrs)		
1110	General Chemistry I	4
1120	General Chemistry II	4
1500	First-Year Connections	1
2010	Intro Inorganic Chemistry	3
3010	Organic Chemistry I	4
3020	Organic Chemistry II	4
3410	Quantitative Analysis	4
3500	Elements of Physical Chem.	3
4520	Instrumental Analysis	4
4910	Chemistry Seminar	2
Advanced Chemistry Courses		
4710	Environmental Chemistry	3
4720	Advanced Environmental Chem	3
4XXX	CHEM Elective	3

<b>BIOLOGY</b> (8 hrs)		
1113	General Biology I	4
1123	General Biology II	4

<b>MATHEMATICS</b> (7 hrs)		
1530	Introductory Statistics	3
1910	Calculus I	4

<b>PHYSICS</b> (8 hrs)		
2010	Algebra-Based Physics I	4
2020	Algebra-Based Physics II	4

<b>ENGLISH</b> (6 hrs)		
1010	English Composition I	3
1020	English Composition II	3

<b>HUMANITIES</b> (9 hrs)		
Literature		3
		3
		3

<b>HISTORY</b> (6 hrs)		
2010	Early US History	3
2020	Modern US History	3

<b>SOCIAL SCIENCE*</b> (6 hrs)		
		3
		3

<b>COMMUNICATION</b> (3 hrs)		
		3

<b>Technical Requirements*</b> (15 hrs)		
BIOL 3120	General Ecology	3
Chosen from:		12
AGRN 3230, 4220		
BIOL 4130, 4840		
GEOG 4510		
GEOL 4300, 4711		
<b>Electives</b> (9-11 hrs)		
<b>TOTAL</b>		120

## Bachelor of Science, Chemistry Major Environmental Chemistry Concentration

<b>FRESHMAN YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	1110,1120	General Chemistry I,II	8
CHEM	1500	First-Year Connections/Advisement	1
BIOL	1113,1123	General Biology I,II	8
MATH	1910	Calculus I	4
ENGL	1010,1020	English Composition I,II	6
GE/HUM	-----	Humanities	3
		<b>TOTAL</b>	30
<b>SOPHOMORE YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	2010	Introduction to Inorganic Chemistry	3
CHEM	3410	Quantitative Analysis	4
CHEM	3500	Elements of Physical Chemistry	3
BIOL	3120	General Ecology	3
PHYS	2010,2020	Algebra-Based Physics I,II	8
DTR	-----	Technical Requirement*	3
GE/SS	-----	Social Science	3
GE/COM	COMM or PC	2025 or 2500	3
		<b>TOTAL</b>	30
<b>JUNIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	3010,3020	Organic Chemistry I,II	8
CHEM	4520	Instrumental Analysis	4
MATH	1530	Introductory Statistics	3
HIST	2010,2020	Early and Modern US History	6
ENGL	-----	Literature 2130, 2235 or 2330	3
DTR	-----	Technical Requirements*	6
		<b>TOTAL</b>	30
<b>SENIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	4910	Chemistry Seminar	2
CHEM	4710,4720	Environmental Chemistry	6
CHEM	4XXX	CHEM Elective (see advisor)	3
GE/HUM	-----	Humanities	3
DTR	-----	Technical Requirement*	3
GE/SS	-----	Social Science	3
ELEC	-----	Electives	10
		<b>TOTAL</b>	30

## Bachelor of Science, Chemistry Major Forensic Chemistry Concentration

<b>CHEMISTRY</b> (41 hrs)		
1110	General Chemistry I	4
1120	General Chemistry II	4
1500	First-Year Connections	1
2010	Intro Inorganic Chemistry	3
3010	Organic Chemistry I	4
3020	Organic Chemistry II	4
3410	Quantitative Analysis	4
3500	Elements of Physical Chem.	3
4520	Instrumental Analysis	3
4910	Chemistry Seminar	2
Advanced Chemistry Courses		
4410	Forensic Chemistry	4
4610	Biochemistry I	3
4650	Biochemistry Laboratory	2

<b>BIOLOGY</b> (8 hrs)		
1113	General Biology I	4
1123	General Biology II	4

<b>MATHEMATICS</b> (7 hrs)		
1530	Introductory Statistics	3
1910	Calculus I	4

<b>PHYSICS</b> (8 hrs)		
2010	Algebra-Based Physics I	4
2020	Algebra-Based Physics II	4

<b>ENGLISH</b> (6 hrs)		
1010	English Composition I	3
1020	English Composition II	3

<b>HUMANITIES</b> (9 hrs)		
Literature		3
		3
		3

<b>HISTORY</b> (6 hrs)		
2010	Early US History	3
2020	Modern US History	3

<b>SOCIAL SCIENCE</b> (6 hrs)		
		3
		3

<b>COMMUNICATION</b> (3 hrs)		
		3

<b>Technical Requirements</b> (16 hrs)		
BIOL 3810	General Genetics	4
BIOL 4150	Molecular Genetics	3
CJ 2660	Intro to Crim. Just.	3
CJ 4250	Drugs & Behav. Phar.	3
BIOL 3330	Entomology OR	
CJ 3640	Cybercrime	3
<b>Electives</b> (8-10 hrs)		
<b>TOTAL</b>		120

## Bachelor of Science, Chemistry Major Forensic Chemistry Concentration

<b>FRESHMAN YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	1110,1120	General Chemistry I,II	8
CHEM	1500	First-Year Connections/Advisement	1
BIOL	1113,1123	General Biology I,II	8
MATH	1910	Calculus I	4
ENGL	1010,1020	English Composition I,II	6
GE/HUM	-----	Humanities	3
		<b>TOTAL</b>	30
<b>SOPHOMORE YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	2010	Introduction to Inorganic Chemistry	3
CHEM	3410	Quantitative Analysis	4
CHEM	3500	Elements of Physical Chemistry	3
BIOL	3810	General Genetics	4
PHYS	2010,2020	Algebra-Based Physics I,II	8
CJ	2660	Introduction to Criminal Justice	3
MATH	1530	Introductory Statistics	3
GE/COM	COMM or PC	2025 or 2500	3
		<b>TOTAL</b>	31
<b>JUNIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	3010,3020	Organic Chemistry I,II	8
CHEM	4520	Instrumental Analysis	4
BIOL	4150	Molecular Genetics	3
CJ	4250	Drugs & Behavioral Pharmacology	3
HIST	2010,2020	Early and Modern US History	6
ENGL	-----	Literature 2130, 2235 or 2330	3
GE/SS	-----	Social Science	3
		<b>TOTAL</b>	30
<b>SENIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	4910	Chemistry Seminar	2
CHEM	4410	Forensic Chemistry	4
CHEM	4610	Biochemistry I	3
CHEM	4650	Biochemistry Lab	2
GE/HUM	-----	Humanities	3
DTR	BIOL or CJ	3330 Entomology or 3640 Cybercrime	3
GE/SS	-----	Social Science	3
ELEC	-----	Electives	9
		<b>TOTAL</b>	29



## Bachelor of Science, Chemistry Major Health Science Chemistry Concentration

<b>CHEMISTRY</b> (41 hrs)		
1110	General Chemistry I	4
1120	General Chemistry II	4
1500	First-Year Connections	1
2010	Intro Inorganic Chemistry	3
3010	Organic Chemistry I	4
3020	Organic Chemistry II	4
3410	Quantitative Analysis	4
3420	Analytical Applications	3
3500	Elements of Physical Chem.	3
4910	Chemistry Seminar	2
Advanced Chemistry Courses		
4610	Biochemistry I	3
4620	Biochemistry II	3
4XXX	CHEM Elective	3

<b>BIOLOGY</b> (8 hrs)		
1113	General Biology I	4
1123	General Biology II	4

<b>MATHEMATICS</b> (7 hrs)		
1530	Introductory Statistics	3
1910	Calculus I	4

<b>PHYSICS</b> (8 hrs)		
2010	Algebra-Based Physics I	4
2020	Algebra-Based Physics II	4

<b>ENGLISH</b> (6 hrs)		
1010	English Composition I	3
1020	English Composition II	3

<b>HUMANITIES</b> (9 hrs)		
Literature		3
		3
		3

<b>HISTORY</b> (6 hrs)		
2010	Early US History	3
2020	Modern US History	3

<b>SOCIAL SCIENCE*</b> (6 hrs)		
		3
		3

<b>COMMUNICATION</b> (3 hrs)		
		3

<b>Technical Requirements</b> (15-16 hrs)		
BIOL 2010	Anatomy & Phys. I	4
BIOL 2020	Anatomy & Phys. II	4
BIOL 3230	HS Microbiology	4
Chosen from:		3-4
BIOL 3810, 4040 or 4150		
<b>Electives</b> (8-11 hrs)		
<b>TOTAL</b>		120

## Bachelor of Science, Chemistry Major Health Science Chemistry Concentration

<b>FRESHMAN YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	1110,1120	General Chemistry I,II	8
CHEM	1500	First-Year Connections/Advisement	1
BIOL	1113,1123	General Biology I,II	8
MATH	1910	Calculus I	4
ENGL	1010,1020	English Composition I,II	6
GE/SS	-----	Social Science	3
		<b>TOTAL</b>	30
<b>SOPHOMORE YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	2010	Introduction to Inorganic Chemistry	3
CHEM	3010,3020	Organic Chemistry I,II	8
BIOL	2010,2020	Anatomy & Physiology I & II	8
PHYS	2010,2020	Algebra-Based Physics I,II	8
MATH	1530	Introductory Statistics	3
		<b>TOTAL</b>	30
<b>JUNIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	3410,3420	Quant. Analysis, Analytical Appl'ns	7
CHEM	3500	Elements of Physical Chemistry	3
BIOL	3230	Health Science Microbiology	4
HIST	2010,2020	Early and Modern US History	6
ENGL	-----	Literature 2130, 2235 or 2330	3
GE/SS	-----	Social Science	3
GE/HUM	-----	Humanities	3
		<b>TOTAL</b>	29
<b>SENIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	4910	Chemistry Seminar	2
CHEM	4610,4620	Biochemistry I & II	6
CHEM	4XXX	CHEM Elective (see advisor)	3
BIOL	-----	Technical Requirement*	3-4
GE/COM	COMM or PC	2025 or 2500	3
GE/HUM	-----	Humanities	3
ELEC	-----	Electives	10-11
		<b>TOTAL</b>	31

\* Technical Requirement, see previous page

## Bachelor of Science, Chemistry Major Business Chemistry Concentration

<b>CHEMISTRY</b> (41 hrs)	
1110 General Chemistry I	4
1120 General Chemistry II	4
1500 First-Year Connections	1
2010 Intro Inorganic Chemistry	3
3010 Organic Chemistry I	4
3020 Organic Chemistry II	4
3410 Quantitative Analysis	4
3420 Analytical Applications	3
3500 Elements of Physical Chem.	3
4910 Chemistry Seminar	2
Advanced Chemistry Courses (Approved by advisor)	9

<b>BIOLOGY</b> (8 hrs)	
1113 General Biology I	4
1123 General Biology II	4

<b>MATHEMATICS</b> (7 hrs)	
1530 Introductory Statistics	3
1910 Calculus I	4

<b>PHYSICS</b> (8 hrs)	
2010 Algebra-Based Physics I	4
2020 Algebra-Based Physics II	4

<b>ENGLISH</b> (6 hrs)	
1010 English Composition I	3
1020 English Composition II	3

<b>HUMANITIES</b> (9 hrs)	
Literature	3
	3
	3

<b>HISTORY</b> (6 hrs)	
2010 Early US History	3
2020 Modern US History	3

<b>SOCIAL SCIENCE</b> (6 hrs)	
ECON 2010 Microeconomics	3
ECON 2020 Macroeconomics	3

<b>COMMUNICATION</b> (3 hrs)	
	3

<b>Technical Requirements</b> (15 hrs)	
ACCT 3720 Surv. of Account.	3
BMGT 3510 Management	3
FIN 3210 Prin. of Finance	3
MKT 3400 Prin. of Marketing	3
DS 3620 or LAW 2810	3
<b>Electives</b> (9-11 hrs)	
<b>TOTAL</b>	120

## Bachelor of Science, Chemistry Major Business Chemistry Concentration

<b>FRESHMAN YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	1110,1120	General Chemistry I,II	8
CHEM	1500	First-Year Connections/Advisement	1
BIOL	1113,1123	General Biology I,II	8
MATH	1910	Calculus I	4
ENGL	1010,1020	English Composition I,II	6
GE/HUM	-----	Humanities	3
		<b>TOTAL</b>	30
<b>SOPHOMORE YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	2010	Introduction to Inorganic Chemistry	3
CHEM	3410,3420	Quant.Analysis, Analytical Appl'ns	7
ACCT	3720	Survey of Accounting	3
PHYS	2010,2020	Algebra-Based Physics I,II	8
ECON	2010,2020	Micro- & Macroeconomics (GE-SS)	6
GE/COM	COMM or PC	2025 or 2500	3
		<b>TOTAL</b>	30
<b>JUNIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	3010,3020	Organic Chemistry I,II	8
CHEM	3500	Elements of Physical Chemistry	3
MATH	1530	Introductory Statistics	3
HIST	2010,2020	Early and Modern US History	6
ENGL	-----	Literature 2130, 2235 or 2330	3
BMGT	3510	Management & Organizational Behavior	3
MKT	3400	Principles of Marketing	3
		<b>TOTAL</b>	29
<b>SENIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	4910	Chemistry Seminar	2
CHEM	4XXX	Advanced CHEM Courses (See advisor)	9
GE/HUM	-----	Humanities	3
FIN	3210	Principles of Managerial Finance	3
DTR	-----	Technical Requirement*	3
ELEC	-----	Electives	11
		<b>TOTAL</b>	31

\* See previous page.

# Bachelor of Science, Chemistry Major Industrial Chemistry Concentration

<b>CHEMISTRY</b> (41 hrs)	
1110 General Chemistry I	4
1120 General Chemistry II	4
1500 First-Year Connections	1
2010 Intro Inorganic Chemistry	3
3010 Organic Chemistry I	4
3020 Organic Chemistry II	4
3410 Quantitative Analysis	4
3420 Analytical Applications	3
3500 Elements of Physical Chem.	3
4910 Chemistry Seminar	2
Advanced Chemistry Courses	
4210 Chemistry of Polymers	3
4520 Instrumental Analysis	4
4710 Environmental Chemistry	3

<b>BIOLOGY</b> (8 hrs)	
1113 General Biology I	4
1123 General Biology II	4

<b>MATHEMATICS</b> (7 hrs)	
1530 Introductory Statistics	3
1910 Calculus I	4

<b>PHYSICS</b> (8 hrs)	
2010 Algebra-Based Physics I	4
2020 Algebra-Based Physics II	4

<b>ENGLISH</b> (6 hrs)	
1010 English Composition I	3
1020 English Composition II	3

<b>HUMANITIES</b> (9 hrs)	
Literature	3
	3
	3

<b>HISTORY</b> (6 hrs)	
2010 Early US History	3
2020 Modern US History	3

<b>SOCIAL SCIENCE*</b> (6 hrs)	
	3
	3

<b>COMMUNICATION</b> (3 hrs)	
	3

<b>Technical Requirements</b> (15-16 hrs)	
MET 1100 Intro to MET	2
MET 2000 Occupational Safety	2
MET 2400 Statics & Strengths	3
PC 3250 Professional Comm.	3
COOP 2010, 2020, 2030	3
ACCT 3720, MET 3100, 3740 OR	
COOP 4010, 4020, 4030	2-3
<b>Electives</b> (7-10 hrs)	
<b>TOTAL</b>	120

## Bachelor of Science, Chemistry Major Industrial Chemistry Concentration

<b>FRESHMAN YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	1110,1120	General Chemistry I,II	8
CHEM	1500	First-Year Connections/Advisement	1
BIOL	1113,1123	General Biology I,II	8
MATH	1910	Calculus I	4
ENGL	1010,1020	English Composition I,II	6
MET	1100	Intro. to Manufacturing/Engineering	2
GE/HUM	-----	Humanities	3
		<b>TOTAL</b>	32
<b>SOPHOMORE YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	2010	Introduction to Inorganic Chemistry	3
CHEM	3410,3420	Quant. Analysis, Analytical Appl'ns	7
PHYS	2010,2020	Algebra-Based Physics I,II	8
MET	2000	Occupational Safety	2
MET	2400	Statics & Strengths of Materials	3
MATH	1530	Introductory Statistics	3
GE/COM	COMM or PC	2025 or 2500	3
		<b>TOTAL</b>	29
<b>JUNIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	3010,3020	Organic Chemistry I,II	8
CHEM	3500	Elements of Physical Chemistry	3
CHEM	4520	Instrumental Analysis	4
CHEM	4710	Environmental Chemistry	3
HIST	2010,2020	Early and Modern US History	6
ENGL	-----	Literature 2130, 2235 or 2330	3
PC	3520	Professional Communications	3
		<b>TOTAL</b>	30
<b>COOP 2010-2030</b>		After Junior Year (3 semesters)	3
<b>SENIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	4910	Chemistry Seminar	2
CHEM	4210	Chemistry of Polymers	3
GE/HUM	-----	Humanities	3
DTR	-----	Technical Requirement	2-3
GE/SS	-----	Social Science	6
ELEC	-----	Electives	12
		<b>TOTAL</b>	28

## Bachelor of Science, Chemistry Major Custom Chemistry Concentration

<b>CHEMISTRY</b> (41 hrs)	
1110 General Chemistry I	4
1120 General Chemistry II	4
1500 First-Year Connections	1
2010 Intro Inorganic Chemistry	3
3010 Organic Chemistry I	4
3020 Organic Chemistry II	4
3410 Quantitative Analysis	4
3420 Analytical Applications	3
3500 Elements of Physical Chem.	3
4910 Chemistry Seminar	2
Advanced Chemistry Courses (Approved by advisor)	9

<b>BIOLOGY</b> (8 hrs)	
1113 General Biology I	4
1123 General Biology II	4

<b>MATHEMATICS</b> (7 hrs)	
1530 Introductory Statistics	3
1910 Calculus I	4

<b>PHYSICS</b> (8 hrs)	
2010 Algebra-Based Physics I	4
2020 Algebra-Based Physics II	4

<b>ENGLISH</b> (6 hrs)	
1010 English Composition I	3
1020 English Composition II	3

<b>HUMANITIES</b> (9 hrs)	
Literature	3
	3
	3

<b>HISTORY</b> (6 hrs)	
2010 Early US History	3
2020 Modern US History	3

<b>SOCIAL SCIENCE</b> (6 hrs)	
	3
	3

<b>COMMUNICATION</b> (3 hrs)	
	3

<b>Technical Requirements</b> (14 hrs)	
(Approved by advisor)	
<b>Electives</b> (9-11 hrs)	
<b>TOTAL</b>	120

## Bachelor of Science, Chemistry Major Custom Chemistry Concentration

<b>FRESHMAN YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	1110,1120	General Chemistry I,II	8
CHEM	1500	First-Year Connections/Advisement	1
BIOL	1113,1123	General Biology I,II	8
MATH	1910	Calculus I	4
ENGL	1010,1020	English Composition I,II	6
GE/HUM	-----	Humanities	3
		<b>TOTAL</b>	30

<b>SOPHOMORE YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	2010	Introduction to Inorganic Chemistry	3
CHEM	3410,3420	Quant. Analysis, Analytical Appl'ns	7
PHYS	2010,2020	Algebra-Based Physics I,II	8
MATH	1530	Introductory Statistics	3
DTR	-----	Technical Requirement*	4
GE/SS	-----	Social Science	3
GE/COM	COMM or PC	2025 or 2500	3
		<b>TOTAL</b>	31

<b>JUNIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	3010,3020	Organic Chemistry I,II	8
CHEM	3500	Elements of Physical Chemistry	3
HIST	2010,2020	Early and Modern US History	6
ENGL	-----	Literature 2130, 2235 or 2330	3
GE/SS	-----	Social Science	3
DTR	-----	Technical Requirements*	6
		<b>TOTAL</b>	29

<b>SENIOR YEAR</b>			
<b>DISC</b>	<b>NUMBER</b>	<b>SUBJECT</b>	<b>HOURS</b>
CHEM	4910	Chemistry Seminar	2
CHEM	4XXX	Advanced CHEM Courses (see advisor)	9
GE/HUM	-----	Humanities	3
DTR	-----	Technical Requirement*	4
ELEC	-----	Electives	12
		<b>TOTAL</b>	30

\* Technical Requirements, see previous page



## ACS Certification Checklist

Effective Fall 2023

These requirements apply only to ACS certification. The student must still meet the requirements specified for their particular concentration. Note that the **Pure Chemistry** concentration already meets ACS requirements.

Introductory Chemistry				In-Depth Courses/Specific Areas			
Class	Title	Hrs	Lab	Class	Title	Hrs	Lab
1110	General Chemistry I	4	(1)	<b>Biochemistry</b>			
1120	General Chemistry II	4	(1)	4620	Biochemistry II	3	0
1500	First-Year Conn.	1		4650	Biochemistry Lab	2	2
2910	UG Research Methods	1		4xxx	Elective	3	1
<b>Foundation Courses</b>							
Class	Title	Hrs	Lab				
2010	Intro. to Inorganic	3	0				
3010	Organic Chemistry I	4	1	<b>Environmental Chemistry</b>			
3410	Quantitative Anal.	4	2	4710	Environ'l Chem.	3	0
3510	Physical Chem. I *	4	1	4720	Adv. Env. Chem.	3	1
4610	Biochemistry I	3	0	4650	Biochemistry Lab	2	2
Required In-Depth Courses				<b>Health Sciences Chemistry</b>			
Class	Title	Hrs	Lab	4620	Biochemistry II	3	0
3020	Organic Chemistry II	4	1	4650	Biochemistry Lab	2	2
4210	Chem. of Polymers	3	0	4xxx	Elective	3	1
4520	Instrumental Anal. *	4	1				
4910	Seminar	2	0	<b>Forensic Chemistry</b>			
4991	Intro. to Research	1	1	4410	Forensic Chem.	4	1
				4650	Biochemistry Lab	2	2
<b>Mathematics</b>				4xxx	Elective	3	0
1910	Calculus I	4					
1920	Calculus II	4					
<b>Physics</b>							
2110 or 2010		4					
2120 or 2020		4					
* CHEM 3510 & 4520 replace 3500 & 3420, respectively in all curricula except Pure Chemistry.							

# Reading a Course Schedule

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
CHEM	1110	001	80498	General Chemistry I	LEC	4	MWF	08:00 AM	08:50 AM	SLH 126	40	40	80	K Rust
CHEM	1110	002	80499	General Chemistry I	LEC	4	MWF	10:00 AM	10:50 AM	SLH 126	90	-10	80	A Carroll
CHEM	1110	003	80500	General Chemistry I	LEC	4	MWF	11:00 AM	11:50 AM	SLH 126	90	-10	80	A Carroll
CHEM	1110	101	80505	General Chemistry I	LAB	0	M	09:00 AM	11:50 AM	LSC 1305	45	3	48	STAFF
CHEM	1110	102	80506	General Chemistry I	LAB	0	M	10:00 AM	12:50 PM	LSC 1327	24	24	48	STAFF
CHEM	1110	103	80507	General Chemistry I	LAB	0	M	12:00 PM	2:50 PM	LSC 1305	27	21	48	STAFF

- A. SUBJECT – This three or four-letter term describes the general subject or department that houses the course.
- B. COURSE NUMBER – This four-digit number represents a specific course. Courses with 1000 numbers are typically freshman or introductory courses. Increasing numbers represent higher level courses, 2000 (sophomore), 3000 (junior) and 4000 (senior).
- C. SECTION – This three-digit number designates a particular class for the course indicated. Most courses offer multiple sections, representing different times and places. Numbers beginning with “0” indicate a lecture section. Those starting with “1” are laboratory sections. Most science classes require enrollment in one lecture and one lab. Other section types are “5” TTU online lectures, “6” off-campus classes, “8” honors classes, and “R” TN eCampus courses.
- D. CRN – Course registration number. This five-digit number correlates to the course and section. It is entered into Eagle Online when enrolling in the designated class.
- E. TITLE – This title describes the course and correlates to the “Course Number.”
- F. TYPE – This indicates the primary activity for the given section. Possible values are lecture (LEC), laboratory (LAB), recitation (REC), seminar (SEM) and independent study (IND).
- G. CREDIT HRS – The number of credit hours assigned for the course in question. Values can usually range from 1-5 hours, depending upon the nature of the course. Lecture courses account for the largest credit hours, with the value roughly corresponding to the amount of meeting time per week. The most common value is “3”, which would be typical of a course that meets for 55 minutes/period, three periods/week. A lab section displaying 2-4 actual “clock hours” would be equivalent to 1 credit hour, since it is an activity. The credit is usually folded into the corresponding lecture and the lab is assigned “0” credit hours.
- H. DAYS – The days when the class actually meets. Abbreviations are Monday (M), Tuesday (T), Wednesday (W), Thursday (R) and Friday (F).
- I. BEGIN TIME – The time at which the section starts. Most lecture classes run 50 minutes. With a 10-minute break between classes, the next period usually begins on the next hour. Exceptions are two-day courses that may begin on the half-hour.
- J. END TIME – The time when the class should end. This assumes a 50-minute period for a 3-credit class occurring three days/week. Some classes may be MW or TR and run for 75 minutes per period, but for only 2 days/week.
- K. LOCATION - The building and room where the class meets. Consult the campus map for the meaning of the abbreviations.
- L. ENROLLMENT – The number of students enrolled in the given section.
- M. AVAILABLE SEATS – The number of open seats in the section. If this number is 0 or (-), then the section is considered closed.
- N. MAX SEATS - The total number of seats allowed for a given section.
- O. INSTRUCTOR – The faculty member responsible for the given section. Sections listed as STAFF, are typically assigned an instructor at a later date.

Last Name		First		Email	
Class Meeting Time	List Course (Ex. ENGL 1010) for each period.				
	MONDAY (M)	TUESDAY (T)	WEDNESDAY (W)	THURSDAY (R)	FRIDAY (F)
8:00-8:50		8:00			
9:00-9:50		9:00			
		9:30			
10:00-10:50		10:00			
11:00-11:50		11:00  Dead Hour		Dead Hour	
12:00-12:50		12:00			
1:00-1: 50		1:00			
		1:30			
2:00-2:50		2:00			
3:00-3:50		3:00			
4:00-4:50		4:00			
		4:30			
5:00-5:50		5:00			
6:00-6:50					
7:00-7:50					
8:00-8:50					

# EAGLE ONLINE INFORMATION AND REGISTRATION WORKSHEET

NAME: \_\_\_\_\_ TERM: \_\_\_\_\_

T# \_\_\_\_\_ ALTERNATE PIN: \_\_\_\_\_

Access the internet at <https://www.tntech.edu/studyabroad/exchange-students/class-registration.php>. You will be guided through the registration process. Your appointment day/time and alt PIN are obtained from your academic advisor.

TRIAL SCHEDULE						
CRN	DISC	NUMBER	SECTION	DAYS	TIME	CR HRS

ALTERNATE COURSES						

## Course Listing

**CHEM 1000. Chemistry Problem Solving.** Lec. 3. Credit 3. An introductory course for students without sufficient high school background in chemistry. Topics include metric system, atomic structure, bonding stoichiometry, solutions and some descriptive chemistry. Not degree credit as chemistry course. May be used for elective credit in some programs.

**CHEM 1010-20. Introductory Chemistry.** Fall, Spring. Lec. 3. Lab. 3. Credit 4. Prerequisites: CHEM 1010 is a prerequisite to 1020. Overview of chemical principles and applications. Laboratories emphasize general principles of chemistry.

**CHEM 1050. Foundations of Chemistry Laboratory.** Lab. 2. Credit 1. Corequisite: CHEM 1000. Selected experiments to complement lecture material in CHEM 1000.

**CHEM 1110. General Chemistry I.** Fall, Spring. Lec. 3. Lab. 3. Credit 4. General chemistry course for students pursuing a degree in a STEM-related field. Topics include atomic and molecular level structure and properties, stoichiometry, aqueous reactions, thermochemistry and properties of gases. Associated laboratory supports lecture content and incorporates elements of atomic emission spectroscopy and stoichiometric calculations.

**CHEM 1120. General Chemistry II.** Fall, Spring. Lec. 3. Lab. 3. Credit 4. Prerequisite: CHEM 1110, with a grade of C or better. General chemistry course for students pursuing a degree in a STEM-related field. Topics include properties of liquids and solids, solutions, kinetics, thermodynamics, equilibrium and electrochemistry. Associated laboratory supports lecture content and incorporates elements of molecular absorption spectroscopy and equilibrium calculations.

**CHEM 1111. General Chemistry I Honors Recitation.** Rec. 1. Credit 0. Corequisite: CHEM 1110. An ACT score of 30 or higher is also recommended. Selected topics to add depth to the understanding of the material in CHEM 1110. Honors students can receive honors credit for CHEM 1110 by satisfactorily completing both CHEM 1110 and CHEM 1111.

**CHEM 1121. General Chemistry II Honors Recitation.** Rec. 1. Credit 0. Co-requisite: CHEM 1120. A grade of "A" or "B" in CHEM 1110 is also recommended. Selected topics to add depth to the understanding of the material in CHEM 1120. Honors students can receive honors credit for CHEM 1120 by satisfactorily completing both CHEM 1120 and CHEM 1121.

**CHEM 1210. Chemistry for the Life Sciences.** Fall. Lec. 4. Lab. 0. Credit 4. Introduction to chemical principles and their applications to health and disease, which will include chemical structures, moles, organic chemistry, and biochemistry. A knowledge of general mathematics is needed for the use of conversion factors, making of solutions, calculation of dosages, and dilutions. This course will not count as part of a chemistry sequence. (This course is specifically designed for nursing students.)

**CHEM 1310. Concepts of Chemistry.** Lec. 2. Lab. 2. Credit 3. Basic principles of chemistry including atomic structure, chemical bonding, basic stoichiometry, organic and inorganic compounds and kinetic theory. Will not count as part of a chemistry sequence.

**CHEM 1500. First-Year Interactions and Advisement.** Lec. 1. Act. 1. Credit 1. This course engages the student in meaningful classroom and out-of-the classroom activities. This is intended for chemistry majors and emphasizes information, activities and requirements important to becoming an active and competent chemist.

**CHEM 1971, 1972, 1973. Special Topics in General Chemistry.** Fall, Spring. Lec. 0-3. Lab. 0-3. Credit 1, 2, 3. Prerequisites: Consent of chair and instructor. Timely topics in chemistry. Course may be taken for credit more than once.

**CHEM 2010. Introduction to Inorganic Chemistry.** Fall. Lec. 3. Credit 3. Prerequisite: CHEM 1120. Introduction to the basic principles of inorganic chemistry including bonding, nomenclature, coordination chemistry, molecular orbital theory and basic transition metal organometallic chemistry.

**CHEM 2720. Clinical Pharmacology.** Fall. Lec. 2. Credit 2. Prerequisite: CHEM 3010. Principles of pharmacology including chemical structures, actions, and reactions of drugs. Does not count as technical elective in chemistry.

**CHEM 2910. Undergraduate Research Methods.** Fall. Lec. 1. Credit 1. Prerequisite: Permission of the instructor. This course is designed to introduce undergraduate students to the methods used in conducting research. The course is designed to teach students key skills utilized in a research setting, methods of data analysis, as well as how to disseminate information obtained through research. Upon completion of this course, students will be prepared to work effectively in a chemistry department research lab.

**CHEM 2920. Undergraduate Research Methods II.** Spring. Lec. 1. Lab 3. Credit 2. Prerequisite: Successful completion of CHEM 2910 with a B or better. CHEM 292 is designed to apply and utilize the skills obtained in Undergraduate Research Methods (CHEM 2910) in a laboratory setting. Students will work with a faculty mentor on the research project that was assigned to them in CHEM 2910. Work on this project will allow students to build practical research skills that can be transferred to other research projects. Students will also disseminate the findings of their project at Research and Creative Inquiry Day.

**CHEM 3005. Elementary Organic Chemistry.** Fall, Spring. Lec. 3. Lab. 3. Credit 4. Prerequisite: CHEM 1020 or 1120. Aliphatic and aromatic organic chemistry for students in agriculture, home economics, and pre-medical technology. Not for chemistry majors.

**CHEM 3010. Organic Chemistry I.** Fall, Spring. Lec. 3. Lab. 3. Credit 4. Prerequisite: CHEM 1120 with a grade of "C" or better. Study of carbon-containing compounds using the functional group approach and an emphasis in simple mechanisms of aliphatic and aromatic compounds.

**CHEM 3020. Organic Chemistry II.** Fall, Spring. Lec. 3. Lab. 3. Credit 4. Prerequisite: CHEM 3010 with a grade of "C" or better. Study of carbon-containing compounds using the functional group approach and an emphasis in simple mechanisms of aliphatic and aromatic compounds.

**CHEM 3410. Quantitative Analysis.** Fall. Lec. 2. Lab. 6. Credit 4. Prerequisite: CHEM 1120. Introduction to chemical analysis including titrimetric and gravimetric methods involving acid-base, oxidation-reduction and complexometric techniques. Application of mass action, equilibria, and indicators to chemical analysis. Introduction to instrumental analysis including electrochemical and spectroscopic methods.

**CHEM 3420. Analytical Applications.** Spring. Lec. 2. Lab. 6. Credit 4. Prerequisite: CHEM 3410. The application of wet chemical and instrumental methods of analysis to real problems in chemistry, biochemistry and the environment.

**CHEM 3500. Elements of Physical Chemistry.** Spring. Lec. 3. Credit 3. Prerequisite: CHEM 1120 and MATH 1830 or 1910. Survey of physical chemistry designed for those desiring the B.S. degree with a major in chemistry, education, pre-professional studies, biology, or students in general.

**CHEM 3510. Physical Chemistry I.** Fall, Lec. 3. Lab. 3. Credit 4. Prerequisites: CHEM 1120, MATH 1920 and PHYS 2020 or 2110 (2110 may be taken concurrently). Introduction to modern, molecular approach to physical chemistry. A moderately rigorous introduction to quantum chemistry covering symmetry, bonding, molecular spectroscopy and statistical mechanics to set a stage for the molecular treatment of thermodynamics and kinetics in CHEM 3520. Lectures are reinforced by a systematic set of modern spectroscopy laboratory experiments.

**CHEM 3520. Physical Chemistry II.** Spring, Lec. 3. Lab. 3. Credit 4. Prerequisite: CHEM 3510. Kinetic theory of gases and Boltzmann distribution, classical thermodynamics, adiabatic changes and Maxwell equations, heat capacity and equipartition theorem, thermodynamic and statistical entropy, chemical equilibrium, electrochemistry, phase transitions and thermodynamic aspects of phases, introduction to chemical kinetics and reaction dynamics. Lectures are reinforced by a systematic set of classical experiments in thermodynamics and kinetics.

**CHEM 3990. Special Problems in Chemical Education.** Lab. 1. Credit 1. Prerequisites: CHEM 1110, 1120, six additional hours of chemistry, and consent of a faculty research mentor and the departmental chairperson. Independent study of special topics in chemical education under the direction of a faculty mentor. Must be taken twice, preferably in consecutive semesters. Restricted to secondary education chemistry majors.

**CHEM 4110/5110. Inorganic Chemistry.** Fall. Lec. 3. Credit 3. Prerequisites: CHEM 2010 and CHEM 3500 or 3510. Correlation of physical and chemical properties of inorganic compounds and atomic structure.

**CHEM 4150/5150. Inorganic Chemistry Laboratory.** Lab. 3. Credit 1. Corequisite: CHEM 4110/5110. Synthesis, isolation, and characterization of inorganic compounds, using conventional as well as microscale and inert gas techniques.

**CHEM 4210/5210. Chemistry of Polymers.** Fall. Lec. 3. Credit 3. Prerequisites: CHEM 3020 and CHEM 3500 or 3510. Preparation, structure and physical and chemical properties of organic and inorganic polymers. Experimental determination of average molar mass and its correlation to physical properties. Thermal and viscoelastic behavior.

**CHEM 4310/5310. Nuclear Chemistry and Radiochemistry.** Spring. Lec. 2. Lab. 3. Credit 3. Prerequisite: CHEM 3500 or 3510 (may be taken concurrently). Introduction to theory of nuclear stability and decay processes. The laboratory emphasizes the detection, safe handling, and use of radioisotopes in chemical investigations.

**CHEM 4320/5320. Spectrometric Identification of Organic Compounds.** Spring. Lec. 2. Lab. 2. Credit 3. Prerequisites: CHEM 3020 and CHEM 3500 or 3510. The isolation and identification of organic compounds by both chemical and physical means with emphasis on spectroscopic methods.

**CHEM 4410/5410. Forensic Chemistry.** Lec. 3 Lab. 1. Credit 4. Prerequisites: CHEM 1120, 3020 and 3410. This course will examine the application of chemical concepts and methods to the analysis of crime scene evidence.

**CHEM 4500. Nutritional Biochemistry.** Spring. Lec. 3. Lab. 0. Credit 3. Prerequisite: CHEM 3005. Introductory survey course of the chemistry of proteins, lipids, carbohydrates and nucleic acids as related to the study of metabolism, nutrition and physiological function. Not for chemistry majors.

**CHEM 4520/5520. Instrumental Analysis.** Fall. Lec. 3. Lab. 3. Credit 4. Prerequisites: CHEM 3410, 3510. Theory and practice of atomic spectroscopy, chromatography and electroanalysis; discussion of selected instrumental techniques for analysis of surfaces, molecules and particles.

**CHEM 4610/5610. General Biochemistry I.** Fall, Spring. Lec. 3. Credit 3. Prerequisite: CHEM 3010 and 3020 or consent of instructor. Chemistry of proteins, lipids, carbohydrates and nucleic acids. Includes study of pH, buffer system, and biological separation methods.

**CHEM 4620/5620. General Biochemistry II.** Spring. Lec. 3. Credit 3. Prerequisite: CHEM 4610/5610. Intermediary metabolism and its regulation, bioenergetics and photosynthesis, biosynthesis of proteins and nucleic acids.

**CHEM 4650/5650. General Biochemistry Laboratory.** Spring. Lab 6 Credit 2. Prerequisite: CHEM 4610/5610 or 4300. Laboratory techniques associated with contemporary general biochemistry to include buffer preparation, pKa determination, amino acid analysis, protein expression, separation and purification techniques, protein determination, enzymology, equilibrium and binding constant determinations and carbohydrate analysis. CHEM 5650 students will be subjected to more involved procedures in some of the experiments.

**CHEM 4710/5710. Environmental Chemistry.** Lec. 3. Credit 3. Prerequisites: CHEM 3005 or 3010, and CHEM 3410 or 3500 or 3510 (courses from the latter group may be taken concurrently). Basic concepts of environmental chemistry.



**CHEM 4720/5720. Advanced Environmental Chemistry.** Lec. 3. Credit 3. Prerequisites: CHEM 4710/5710. Advanced topics within environmental chemistry including emphasis on organic, inorganic and analytical environmental chemistry. Case studies and contemporary literature in the field will be discussed.

**CHEM 4910. Chemistry Seminar.** Fall. Lec. 2. Credit 2. Prerequisite: One year of chemistry. Chemical literature, report writing, statistics, computers in chemistry, employment and interviewing.

**CHEM 4940. Internship in Chemistry.** Credit 6. Prerequisites: 18 hrs of chemistry, Junior-Senior standing and consent of the chair. Supervised chemical work experience in a private or public agency that is related to the student's career goals. A minimum equivalent to ten weeks of half-time employment is required. Cannot be used to replace core or required elective CHEM courses within the major requirements.

**CHEM 4970/5970. Special Topics.** Lec. 1-3. Lab.0-3. Credit 1-4. Prerequisite: Consent of instructor. Timely topics in chemistry. Course may be taken for credit more than once.

**CHEM 4980. Distinction in Chemistry Research.** Lec. 0. Credit 1. Dissemination of independent research conducted with a chemistry faculty advisor through participation in meetings (national meetings, state meetings and/or Research and Creative Inquiry Day), departmental seminar and mini-thesis.

**CHEM 4991, 4992, 4993. Undergraduate Research.** Lab. 3,6,9. Credit 1,2,3. Prerequisite: Consent of the instructor and departmental chairperson. Study in chemical research; to provide experience in methodology of experimental investigation. (Maximum credit toward degree is four hours.) May not be repeated to improve grade.

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**#CASR200-PRNT-23**



## Department of Chemistry

TENNESSEE TECH

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Student ID (T #) \_\_\_\_\_

I give my TTU academic advisor \_\_\_\_\_ permission to release  
(advisor name)

any information regarding my academic record to the following people:

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Name Relationship

I also give my above advisor permission to release my academic information in the form of recommendation or reference letters for the purpose of applications to employment or post-graduate education.

I understand that the above Release Authorization pertains to all periods of enrollment. I further understand that I may void this authorization at any time in writing, by fax or mail.

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Student Signature Date

### Photo/Video Image Release Authorization

I hereby give the Department of Chemistry of TTU permission to use my photo/video for promotional purposes as they see fit. I understand that I will not be compensated for allowing the department to use my name and likeness.

I understand that the above Release Authorization pertains to all periods of enrollment. I further understand that I may void this authorization at any time in writing, by fax or mail.

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