

Chemistry, Molecular Theory and Simulation (BSCh)

Total Hours Required: 120

Plan of Study

The Plan of Study is a suggested four-year course sequence to support academic planning and serves as a helpful guide. Currently enrolled students should meet with their academic advisor to tailor their course selections and timelines to their individual goals and circumstances.

Course	Title	Hours
Year 1		
Semester 1		
CH 301C	Foundations of Chemistry I	3
M 408C	Differential and Integral Calculus	4
RHE 306	Rhetoric and Writing	3
<u>Visual and Performing Arts (050)</u>		3
<u>First-Year Signature Course (090)</u>		3
Hours		16
Semester 2		
CH 302C	Foundations of Chemistry II	3
CH 204	Introduction to Chemical Practice	2
M 408D	Sequences, Series, and Multivariable Calculus	4
<u>Social and Behavioral Sciences (080)</u>		3
<u>U.S. History (060)</u>		3
Hours		15
Year 2		
Semester 1		
CH 328C	Structure and Reactivity of Organic Molecules I	3
CH 128K	Organic Chemistry Laboratory	1
PHY 301	Mechanics	3
PHY 101L	Laboratory for Physics 301	1
M 427J	Differential Equations with Linear Algebra	4
CH 119C	Professional Development for Chemists	1
Free Elective		3
Hours		16
Semester 2		
CH 329C	Structure and Reactivity of Organic Molecules II	3
CH 128L	Organic Chemistry Laboratory	1
PHY 316	Electricity and Magnetism	3
PHY 116L	Laboratory for Physics 316	1
SDS 320E	Elements of Statistics	3
<u>American and Texas Government (070)</u>		3
Hours		14
Year 3		
Semester 1		
CH 353	Physical Chemistry I	3
<u>American and Texas Government (070)</u>		3
CH 354P	Advanced Chemistry: Molecular Biophysics	3
<u>Humanities (040)</u>		3
NSC 326	Introduction to Scientific Programming	3
Hours		15
Semester 2		
CH 153K	Physical Chemistry Laboratory	1
CH 354	Quantum Chemistry and Spectroscopy	3
CH 354M	Introduction to Computational Methods in Chemistry	3
Hours chosen from: Focus Area Elective		3
<u>U.S. History (060)</u>		3
Hours		13

Year 4		
Semester 1		
CH 354C	Statistical Mechanics	3
Hours chosen from: Focus Area Elective		3
NSC 326	Introduction to Scientific Programming	3
<u>U.S. History (060)</u>		3
Free Elective		4
Hours		16
Semester 2		
CH 378L	Capstone Research and Thesis	3
Hours chosen from: Focus Area Elective		3
Hours chosen from: Focus Area Elective		3
Free Elective		6
Hours		15
Total Hours		120

Requirements

All requirements are listed below, starting with the most specialized moving to the most general. Additional requirements may follow the table, so be sure to read the entire page. Some required courses listed below may also satisfy General Education requirements, including Core Curriculum.

Code	Title	Hours
Concentration		
CH 354C	Statistical Mechanics	3
CH 354M	Introduction to Computational Methods in Chemistry	3
CH 378L	Capstone Research and Thesis	3
NSC 326	Introduction to Scientific Programming	3
Hours chosen from:		15
CH 354P	Advanced Chemistry: Molecular Biophysics	
CH 354S	Elements of Spectroscopy	
CH 154K	Physical Chemistry Laboratory	
CH 365N	Structures and Function of DNA Materials	
CH 366D	Bio-inorganic Chemistry and Spectroscopy	
CH 367C	Materials Chemistry	
CH 367P	Introduction to Polymer Science	
CH 368	Advanced Topics in Chemistry	
CH 369K	Techniques of Research	
CH 375C	Physical Organic Chemistry	
CH 375K	Individual Study in Chemistry	
CH 379H	Chemistry Honors Tutorial Course	
M 368K	Numerical Methods for Applications	
PHY 333	Modern Optics	
PHY 345	Biophysics	
PHY 375S	Introductory Solid-State Physics	
SDS 374C	Parallel Computing for Science and Engineering	
Subtotal		27
Degree (see details below)		47
Free electives: Additional coursework to reach total hours required.		12
Subtotal		59
General Education		
<u>Core Curriculum</u>		34
<u>Foreign Language other than English, Beginning Proficiency</u>		
Subtotal		34
<u>College Requirements - Natural Sciences</u>		

Total Hours	120
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Degree-Bachelor of Science in Chemistry (BSCh)

Six degree plans lead to the Bachelor of Science in Chemistry. Chemical Physics & Instrumentation, Molecular Theory & Simulation, Materials Chemistry, and Synthesis & Chemical Biology are intended to prepare students for professional careers, either upon graduation or after graduate study in chemistry or related fields. Teaching is intended to prepare students to enter the teaching profession. Chemistry Honors is intended to prepare students for academic or research careers. Students who plan to follow Chemistry Honors must be admitted to the [Dean's Scholars, Health Science Scholars, or Polymathic Scholars Honors Program](#).

The six degree plans may also serve as the basis for work in many areas outside pure chemistry, such as materials science, medicine and other health-related fields, pharmacology, patent law, business, computation, or environmental science. Supporting work in mathematics and physics is an integral part of the degree programs. Compared to the program leading to the bachelor of science and arts degree, the Bachelor of Science in Chemistry degree programs are more thorough and demanding and potentially more rewarding to the student planning a career in chemistry.

Code	Title	Hours
Degree		
Choose a sequence below:		8
Sequence 1:		
M 408C	Differential and Integral Calculus	
M 408D	Sequences, Series, and Multivariable Calculus	
Sequence 2:		
M 408N	Differential Calculus for Science	
M 408S	Integral Calculus for Science	
M 408M	Multivariable Calculus	
M 427J	Differential Equations with Linear Algebra	4
SDS 320E	Elements of Statistics	3
Choose a sequence below:		8
Sequence 1:		
PHY 301	Mechanics	
PHY 101L	Laboratory for Physics 301	
PHY 316	Electricity and Magnetism	
PHY 116L	Laboratory for Physics 316	
Sequence 2:		
PHY 303K	Engineering Physics I	
PHY 105M	Laboratory For Physics 302K, 303K, and 317K	
PHY 303L	Engineering Physics II	
PHY 105N	Laboratory For Physics 302L, 303L, and 317L	
CH 401	Principles of Chemistry I	4
or CH 401C	Foundations of Chemistry I	
Choose a sequence below:		4
Sequence 1:		
CH 402	Principles of Chemistry II	
Sequence 2:		
CH 402C	Foundations of Chemistry II	
Sequence 3:		
CH 302	Principles of Chemistry II	

CH 204	Introduction to Chemical Practice	
Sequence 4:		
CH 302C	Foundations of Chemistry II	
CH 204	Introduction to Chemical Practice	
Choose a sequence below:		8
Sequence 1:		
CH 328C	Structure and Reactivity of Organic Molecules I	
CH 329C	Structure and Reactivity of Organic Molecules II	
CH 128K	Organic Chemistry Laboratory	
CH 128L	Organic Chemistry Laboratory	
Sequence 2:		
CH 320M	Organic Chemistry I	
CH 320N	Organic Chemistry II	
CH 220C	Organic Chemistry Laboratory	
Sequence 3:		
CH 328M	Organic Chemistry I	
CH 328N	Organic Chemistry II	
CH 128K	Organic Chemistry Laboratory	
CH 128L	Organic Chemistry Laboratory	
CH 119C	Professional Development for Chemists	1
CH 353	Physical Chemistry I	3
or CH 353M	Physical Chemistry I for Life Sciences	
CH 153K	Physical Chemistry Laboratory	1
CH 354	Quantum Chemistry and Spectroscopy	3
All students must complete at least 36 semester hours of upper-division coursework; at least 21 semester hours of upper-division coursework in chemistry must be completed in residence at the University.		
Total Hours		47

Additional Requirements and Policies

Students in all concentrations must fulfill both the University's [General Requirements](#) for graduation and the [college requirements](#). They must also earn a grade of at least C- in each mathematics and science course required for the degree, and a University grade point average in these courses of at least 2.00. More information about grades and the grade point average is given in the [General Information Catalog](#).

Order and Choice of Work

Students begin the Bachelor of Science in Chemistry degree program with eight or nine hours of introductory chemistry for science majors (CH 401 or CH 401C, and CH 402, CH 402C, or CH 302 and CH 204), as well as M 408C or M 408N. Students should consult with their academic advisors about planning to choose a chemistry degree focus area, appropriate course in mathematics and physical sciences, and about course load and balance between laboratory and lecture courses. Most students will select a degree focus area by the end of the second year and take at least 21 hours of upper-division coursework in the major requirements in the third and fourth years.

E S 301; and M E 377K upon approval of the project by the UTeach Program.