

CHEMISTRY - BS

The BS program in Chemistry is arranged so that a student obtains a comprehensive, solid foundation in all of the major branches of chemistry, combined with a suitable measure of individual flexibility. The latter objective is met in part by a strong emphasis on involving the undergraduate BS chemistry major in exciting, innovative, state-of-the-art research programs. Most students in the BS program become involved in research during their junior year and continue this until graduation. Students frequently receive research scholarships and fellowships, which include opportunities for summer research programs. It is not uncommon for an undergraduate chemistry major to be a coauthor of scientific publications in major research journals before graduation.

Undergraduate chemistry research activities involve substantial use of modern scientific equipment, including major instrumentation. The student involved in this activity also gains considerable insight into the profession by means of substantial individual contact with chemistry department faculty.

The BS degree in Chemistry is the appropriate program for students planning advanced degree programs in chemistry, biochemistry, forensics, chemical physics and other fields. Students planning careers in chemical industry should also choose the BS degree in Chemistry. Students may wish to choose electives suggested in the biological or environmental chemistry tracks. This degree program satisfies fully the accreditation requirements of the American Chemical Society.

Program Requirements

First Year

Fall		Semester Credit Hours
CHEM 100	Horizons in Chemistry	1
CHEM 119	Fundamentals of Chemistry I ¹	4
ENGL 104	Composition and Rhetoric	3
HIST 105	History of the United States ²	3
MATH 151 or MATH 171	Engineering Mathematics I or Calculus I	4
Semester Credit Hours		15

Spring

CHEM 120	Fundamentals of Chemistry II ¹	4
HIST 106	History of the United States ²	3
MATH 152 or MATH 172	Engineering Mathematics II or Calculus II	4
PHYS 206	Newtonian Mechanics for Engineering and Science	3
PHYS 226	Physics of Motion Laboratory for the Sciences	1
Semester Credit Hours		15

Second Year

Fall		Semester Credit Hours
CHEM 227	Organic Chemistry I ¹	3
CHEM 231	Techniques of Organic Chemistry	2
PHYS 207	Electricity and Magnetism for Engineering and Science	3

PHYS 227	Electricity and Magnetism Laboratory for the Sciences	1
Select one of the following		4
MATH 221	Several Variable Calculus	
MATH 251	Engineering Mathematics III	
MATH 253	Engineering Mathematics III	
Semester Credit Hours		13

Spring

CHEM 228	Organic Chemistry II ¹	3
CHEM 234	Organic Synthesis and Analysis ³	3
CHEM 362	Descriptive Inorganic Chemistry	3
Select one of the following:		3
MATH 304	Linear Algebra	
MATH 308	Differential Equations	
STAT 211	Principles of Statistics I	
Mathematics elective (http://catalog.tamu.edu/undergraduate/course-descriptions/math/) ⁴		
Statistics elective (http://catalog.tamu.edu/undergraduate/course-descriptions/stat/) ⁴		

Select one of the following: ⁵ 3

Communication (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication)		
Creative arts (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts)		
Cultural discourse (http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/)		
International and cultural diversity (http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/)		
Language, philosophy and culture (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture)		
Social and behavioral sciences (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences)		
Semester Credit Hours		15

Third Year

Fall		Semester Credit Hours
CHEM 315	Fundamentals of Quantitative Analysis	3
CHEM 318	Quantitative Analysis Laboratory	1
CHEM 327	Physical Chemistry I	3
CHEM 433	Advanced Inorganic Chemistry Laboratory	2
POLS 206	American National Government	3
Select one of the following: ⁵		3

Communication (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication)		
Creative arts (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts)		

Cultural discourse (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/>)

International and cultural diversity (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>)

Language, philosophy and culture (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture>)

Social and behavioral sciences (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences>)

Semester Credit Hours 15

Spring

CHEM 325 Physical Chemistry Laboratory I 1

CHEM 328 Physical Chemistry II 3

POLS 207 State and Local Government 3

Select three of the following: ⁵ 9

Communication (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication>)

Creative arts (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts>)

Cultural discourse (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/>)

International and cultural diversity (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>)

Language, philosophy and culture (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture>)

Social and behavioral sciences (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences>)

Semester Credit Hours 16

Fourth Year

Fall

CHEM 326 Physical Chemistry Laboratory II 1

CHEM 415 Analytical Chemistry 3

CHEM 491 Research ⁶ 3

Select one of the following: ⁷ 3

CHEM 446 Organic Chemistry III

CHEM 456 Chemical Biology

CHEM 462 Inorganic Chemistry

CHEM 464 Nuclear Chemistry

CHEM 466 Polymer Chemistry

CHEM 468 Materials Chemistry of Inorganic Materials

CHEM 470 Industrial Chemistry

CHEM 483 Green Chemistry

CHEM 489 Special Topics in...

BICH 410 Comprehensive Biochemistry I

BICH 411 Comprehensive Biochemistry II

BICH 440 Biochemistry I

BICH 441 Biochemistry II

PHYS 309 Modern Physics

Select two of the following: ⁵ 6

Communication (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication>)

Creative arts (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts>)

Cultural discourse (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/>)

International and cultural diversity (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>)

Language, philosophy and culture (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture>)

Social and behavioral sciences (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences>)

Semester Credit Hours 16

Spring

CHEM 434 Analytical Instrumentation Laboratory 2

CHEM 481 Seminar ³ 2

CHEM 491 Research ⁶ 3

Select one of the following: ⁷ 3

CHEM 446 Organic Chemistry III

CHEM 456 Chemical Biology

CHEM 462 Inorganic Chemistry

CHEM 464 Nuclear Chemistry

CHEM 466 Polymer Chemistry

CHEM 468 Materials Chemistry of Inorganic Materials

CHEM 470 Industrial Chemistry

CHEM 483 Green Chemistry

CHEM 489 Special Topics in...

BICH 410 Comprehensive Biochemistry I

BICH 411 Comprehensive Biochemistry II

BICH 440 Biochemistry I

BICH 441 Biochemistry II

PHYS 309 Modern Physics

Select two of the following: ⁵ 5

Communication (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication>)

Creative arts (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts>)

Cultural discourse (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/>)

International and cultural diversity (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>)

Language, philosophy and culture (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture>)

Social and behavioral sciences (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences>)

General elective

Semester Credit Hours	15
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Total Semester Credit Hours	120
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- ¹ Select a section designated for chemistry majors.
- ² Students may substitute any 6 hours of American history courses approved by the University Core Curriculum to fulfill this requirement, but no more than 3 hours may be in Texas history. Students seeking teacher certification must take HIST 105 and HIST 106.
- ³ This is a designated C- or W-course.
- ⁴ Must be selected in consultation with an advisor.
- ⁵ These electives must include 12 hours of courses which meet the language, philosophy and culture (3 hours), creative arts (3 hours), social and behavioral science (3 hours) and communication (3 hours) requirements of the University Core Curriculum (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/>). In addition, 3 hours of courses must be in the area of International and Cultural Diversity (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>) and 3 hours must be in the area of Cultural Discourse (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/>). These may be in addition to the previous 12 hours of University Core Curriculum (<http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/>) courses, or if a course in this category satisfies an area of the Core, it can be used to meet both requirements. Electives should be chosen in consultation with the chemistry advisor. Electives should be chosen in consultation with the chemistry advisor and should be selected to meet the residency requirement (36 hours at 300-400 level must be taken at TAMU). Electives recommended in the various track programs should be strongly considered.
- ⁶ The total hours of CHEM 485 and CHEM 491 taken by BS chemistry majors on a graded (A–F) basis may not exceed 15. Additional hours of these courses may be taken on a satisfactory/unsatisfactory basis.
- ⁷ Students wishing to complete an American Chemical Society certified degree program must take at least one semester of biochemistry (i.e., BICH 410 or BICH 440).