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

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credit Hours</th>
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</thead>
</table>

Fall
- CHEM 100 Horizons in Chemistry 1
- CHEM 119 Fundamentals of Chemistry I 1
- ENGL 104 Composition and Rhetoric 3
- MATH 151 or MATH 171 Engineering Mathematics I or Calculus I 4
- American history (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history) 3

Spring
- CHEM 120 Fundamentals of Chemistry II 1
- 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
- American history (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history) 3

Second Year

<table>
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<tr>
<th>Semester</th>
<th>Credit Hours</th>
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Fall
- CHEM 227 Organic Chemistry I 1

Spring

Semester Credit Hours 15

Select one of the following:

- CHEM 228 Organic Chemistry II 2
- CHEM 234 Organic Synthesis and Analysis 2
- CHEM 362 Descriptive Inorganic Chemistry 3

Select one of the following:

- MATH 304 Linear Algebra 3
- MATH 308 Differential Equations 3
- STAT 211 Principles of Statistics I 3
- Communication (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication) 3

Third Year

<table>
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<th>Semester</th>
<th>Credit Hours</th>
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</table>

Fall
- 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
- Creative arts (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts) 3

Spring
- CHEM 325 Physical Chemistry Laboratory I 1
- CHEM 328 Physical Chemistry II 3
- POLS 207 State and Local Government 3
- Language, philosophy and culture (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture) 3
- Social and behavioral sciences (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences) 3
- General elective 3

Fourth Year

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<th>Semester</th>
<th>Credit Hours</th>
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</table>

Fall
- CHEM 326 Physical Chemistry Laboratory II 1
- CHEM 415 Analytical Chemistry 3
- CHEM 491 Research 4

Select one of the following:

- BICH 410 Comprehensive Biochemistry I 3
- BICH 411 Comprehensive Biochemistry II 3
- BICH 440 Biochemistry I 3
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BICH 441</td>
<td>Biochemistry II</td>
</tr>
<tr>
<td>CHEM 446</td>
<td>Organic Chemistry III</td>
</tr>
<tr>
<td>CHEM 456</td>
<td>Chemical Biology</td>
</tr>
<tr>
<td>CHEM 462</td>
<td>Inorganic Chemistry</td>
</tr>
<tr>
<td>CHEM 464</td>
<td>Nuclear Chemistry</td>
</tr>
<tr>
<td>CHEM 466</td>
<td>Polymer Chemistry</td>
</tr>
<tr>
<td>CHEM 468</td>
<td>Materials Chemistry of Inorganic Materials</td>
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<tr>
<td>CHEM 470</td>
<td>Industrial Chemistry</td>
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<tr>
<td>CHEM 483</td>
<td>Green Chemistry</td>
</tr>
<tr>
<td>CHEM 489</td>
<td>Special Topics in...</td>
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<tr>
<td>PHYS 309</td>
<td>Modern Physics</td>
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General electives 3

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<th>Semester Credit Hours</th>
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**Spring**

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CHEM 434</td>
<td>Analytical Instrumentation Laboratory</td>
</tr>
<tr>
<td>CHEM 481</td>
<td>Seminar 2</td>
</tr>
<tr>
<td>CHEM 491</td>
<td>Research 4</td>
</tr>
</tbody>
</table>

Select one of the following: 5

- BICH 410 Comprehensive Biochemistry I
- BICH 411 Comprehensive Biochemistry II
- BICH 440 Biochemistry I
- BICH 441 Biochemistry II
- 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...
- PHYS 309 Modern Physics

General electives 3

<table>
<thead>
<tr>
<th>Semester Credit Hours</th>
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</table>

**Total Semester Credit Hours** 120

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1. Select a section designated for chemistry majors.
2. This is a designated C- or W-course.
3. Select any course 100-499 not used elsewhere except AERS 100-299, CHEM 222, CHEM 242; MATH 102, MATH 140, MATH 142, MATH 167, MATH 168; MLSC 100-299; NVSC 100-299; PHYS 201, PHYS 202, PHYS 205.
4. Students may substitute 3 hours of CHEM 484 for CHEM 491 in consultation with an advisor.
5. 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).

Graduation requirements include a requirement for 3 hours of International and Cultural Diversity (http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/) courses and 3 hours of Cultural Discourse (http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/) courses. A course satisfying a Core category, a college/department requirement, or a general elective can be used to satisfy this requirement.

The total hours of CHEM 484, 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.

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 Texas A&M).