

CHEMISTRY - BS, MATERIALS CHEMISTRY TRACK

The Department of Chemistry offers a Bachelor of Science in Chemistry with a Materials Chemistry Track. In materials chemistry, molecular-level understanding drives the design, synthesis, and characterization of materials with interesting and useful properties. Insight into catalytic, electronic, optical, or structural characteristics of substances allows them to be tailored for different applications. This track includes a breadth of coverage in both hard and soft materials and prepares students for further study in materials chemistry or employment in a variety of industries.

Program Requirements

First Year

| | | Semester Credit Hours |
|--|---|-----------------------|
| Fall | | |
| CHEM 100 | Horizons in Chemistry | 1 |
| CHEM 119 | Fundamentals of Chemistry I ¹ | 4 |
| ENGL 104 or ENGL 210 | Composition and Rhetoric or Technical and Professional Writing | 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 |
| Semester Credit Hours | | 15 |

| | | |
|--|---|-----------|
| Spring | | |
| CHEM 120 | Fundamentals of Chemistry II ¹ | 4 |
| 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 |
| Semester Credit Hours | | 15 |

Second Year

| | | Semester Credit Hours |
|------------------------------|---|-----------------------|
| Fall | | |
| 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 | | 3-4 |
| 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 ² | 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 | |
| Materials chemistry elective ³ | | 3 |
| Semester Credit Hours | | 15 |

Third Year

| | | Semester Credit Hours |
|------------------------------|--|-----------------------|
| 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 |
| CHEM 468 | Materials Chemistry of Inorganic Materials | 3 |
| CHEM 491 | Research | 3 |
| Semester Credit Hours | | 15 |

Spring

| | | |
|---|---------------------------------|-----------|
| CHEM 325 | Physical Chemistry Laboratory I | 1 |
| CHEM 328 | Physical Chemistry II | 3 |
| CHEM 466 | Polymer Chemistry | 3 |
| CHEM 491 | Research | 3 |
| Communication (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication) | | 3 |
| Materials chemistry elective ³ | | 3 |
| Semester Credit Hours | | 16 |

Fourth Year

| | | Semester Credit Hours |
|--|----------------------------------|-----------------------|
| Fall | | |
| CHEM 326 | Physical Chemistry Laboratory II | 1 |
| CHEM 415 | Analytical Chemistry | 3 |
| POLS 207 | State and Local Government | 3 |
| Creative arts (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts) | | 3 |
| Language, philosophy and culture (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture) | | 3 |
| Materials chemistry elective ³ | | 3 |
| Semester Credit Hours | | 16 |

Spring

| | | |
|--|---------------------------------------|---|
| CHEM 434 | Analytical Instrumentation Laboratory | 2 |
| CHEM 481 | Seminar ² | 2 |
| POLS 206 | American National Government | 3 |
| Social and behavioral sciences (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences) | | 3 |
| Materials chemistry elective ³ | | 3 |

| | |
|------------------------------------|------------|
| General elective ⁵ | 2-3 |
| Semester Credit Hours | 15 |
| Total Semester Credit Hours | 120 |

¹ Select a section designated for chemistry majors.

² This is a designated oral communication (C) or writing (W) course.

³ In consultation with an advisor, select 12 hours from among CHEM 220; CHEM 462; CHEM 470; MEEN 222/MSEN 222 or BMEN 343, MEEN 458.

⁴ Three hours of CHEM 484 may be substituted for 3 hours of CHEM 491 in consultation with an advisor.

⁵ Select any course 100-499 not used elsewhere except AERS 100-299 (<http://catalog.tamu.edu/undergraduate/course-descriptions/aers/>); CHEM 222, CHEM 242; MATH 102, MATH 140, MATH 142, MATH 167, MATH 168; MLSC 100-299 (<http://catalog.tamu.edu/undergraduate/course-descriptions/mlsc/>); NVSC 100-299 (<http://catalog.tamu.edu/undergraduate/course-descriptions/nvsc/>); PHYS 201, PHYS 202, PHYS 205.

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. (<http://catalog.tamu.edu/undergraduate/general-information/degree-information/#requirementsforabaccalaureatedegree>)