

CHEMISTRY - BS, MATERIALS CHEMISTRY TRACK

The Materials Chemistry track for the Bachelor of Science in Chemistry 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.

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.

Program Requirements

First Year

Fall		Semester Credit Hours
CHEM 100	Horizons in Chemistry	1
CHEM 119	Fundamentals of Chemistry I ¹	4
Select one of the following:		3
ENGL 103	Introduction to Rhetoric and Composition	
ENGL 104	Composition and Rhetoric	
ENGL 210	Technical and Professional Writing	
MATH 151	Engineering Mathematics I	4
or MATH 171	or Calculus I	
American history (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history)		3

Semester Credit Hours 15

Spring		Semester Credit Hours
CHEM 120	Fundamentals of Chemistry II ¹	4
MATH 152	Engineering Mathematics II	4
or MATH 172	or Calculus II	
PHYS 206	Newtonian Mechanics for Engineering and Science	3
PHYS 226	Physics of Motion Laboratory for the Sciences	1
American history (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history)		3

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:		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

Fall

CHEM 315	Fundamentals of Quantitative Analysis ¹	3
CHEM 318	Quantitative Analysis Laboratory	1
CHEM 327	Physical Chemistry I	3
CHEM 433	Advanced Inorganic Chemistry Laboratory	2
CHEM 466	Polymer Chemistry	3
CHEM 491	Research	3

Semester Credit Hours 15

Spring

CHEM 325	Physical Chemistry Laboratory I	1
CHEM 328	Physical Chemistry II	3
CHEM 491	Research	3
POLS 207	State and Local Government	3
Communication (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication)		3
Materials chemistry elective ³		3

Semester Credit Hours 16

Fourth Year

Fall

CHEM 326	Physical Chemistry Laboratory II	1
CHEM 415	Analytical Chemistry	3
CHEM 468	Materials Chemistry of Inorganic Materials	3
Creative arts (https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts)		3
Language, philosophy and culture (https://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 (https://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 (<https://catalog.tamu.edu/undergraduate/course-descriptions/aers/>); CHEM 222, CHEM 242; MATH 102, MATH 140, MATH 142, MATH 167, MATH 168; MLSC 100-299 (<https://catalog.tamu.edu/undergraduate/course-descriptions/mlsc/>); NVSC 100-299 (<https://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 (<https://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>) courses and 3 hours of Cultural Discourse (<https://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. (<https://catalog.tamu.edu/undergraduate/general-information/degree-information/#requirementsforabacalaureatedegree>)