Chemistry - B.S. (Traditional Option) College of Arts and Sciences

The Department of Chemistry offers the Bachelor of Science degree for students who intend to become professional chemists or do graduate work in chemistry or a closely related discipline. There are three options in the B.S. program: a traditional track covering all the major areas of chemistry, an option that emphasizes biochemistry and an option in materials chemistry. The Biochemistry and Traditional Options are certified by the American Chemical Society. A Bachelor of Arts degree program is offered as well for students who want greater flexibility in the selection of courses to perhaps pursue more diverse degree options, including dual and double majors. The Department also offers the Master of Science and the Doctor of Philosophy degree.

123 hours (minimum)
Any student earning a Bachelor of Science (B.S.) degree must complete a minimum of 60 hours in natural, physical, mathematical, and computer science. For a complete description of College requirements for a Bachelor of Science degree, including a specific listing of courses applicable to the 60-hour requirement, see the Arts and Sciences section of the 2023-2024 Undergraduate Catalog.

UK Core Requirements
See the UK Core section of the 2023-2024 Undergraduate Catalog for the complete UK Core requirements. The courses listed below are (a) recommended by the college, or (b) required courses that also fulfill UK Core areas. Students should work closely with their advisor to complete the UK Core requirements.

I. Intellectual Inquiry in Arts and Creativity
Choose one course from approved list..........................3

II. Intellectual Inquiry in the Humanities
Choose one course from approved list..........................3

III. Intellectual Inquiry in the Social Sciences
Choose one course from approved list..........................3

IV. Intellectual Inquiry in the Natural, Physical, and Mathematical Sciences
CHE 105 General College Chemistry I..........................4
CHE 111 General Chemistry I Laboratory.........................1

V. Composition and Communication I
CIS/WRD 110 Composition and Communication I..............3

VI. Composition and Communication II
CIS/WRD 111 Composition and Communication II..............3

VII. Quantitative Foundations
MA 113 Calculus I.........................................................4

VIII. Statistical Inferential Reasoning
Choose one course from approved list..........................3

IX. Community, Culture and Citizenship in the USA
Choose one course from approved list..........................3

X. Global Dynamics
Choose one course from approved list..........................3

UK Core hours ..................................................................33

Graduation Composition and Communication Requirement (GCCR)
WRD 310 Writing in the Natural Sciences........................3

College Requirements
I. Foreign Language (placement exam recommended)...........0-14
II. Disciplinary Requirements
   a. Natural Science (completed by Major Requirements)....
   b. Social Science......................................................3
   c. Humanities.........................................................3
   III. Laboratory or Field Work (completed by Premajor Requirement)
   IV. Race and Ethnicity Requirement................................0-3
   V. Electives..............................................................6

College Requirement hours: .............................................12-29

Premajor Requirements
*MA 113 Calculus I.........................................................4
MA 114 Calculus II..........................................................4
*CHE 105 General College Chemistry I............................4
CHE 107 General College Chemistry II............................3
*CHE 111 General Chemistry I Laboratory......................1
CHE 113 General Chemistry II Laboratory.......................2

Premajor hours: ...............................................................18

Major Requirements
CHE 226 Analytical Chemistry.........................................3
CHE 230 Organic Chemistry I..........................................3
CHE 231 Organic Chemistry Laboratory I........................1
CHE 232 Organic Chemistry II........................................3
CHE 410G Inorganic Chemistry....................................2
CHE 412 Inorganic Chemistry Laboratory........................2
CHE 422 Instrumental Analysis.......................................4
CHE 441 Physical Chemistry Laboratory..........................2
CHE 442G Thermodynamics and Kinetics......................3
CHE 532 Spectrometric Identification of Organic Molecules..2
CHE 533 Advanced Organic Chemistry Laboratory..........2
CHE 547 Principles of Physical Chemistry I.....................3
CHE 550 Biological Chemistry I
or
CHE 552 Biological Chemistry II.................................3

Major Core hours: ..........................................................33

Other Course Work Required for the Major
From the Major Department:
Chemistry Major Field Options.....................................6
Choose six hours from the following: up to six hours of CHE 395, any CHE 500-level course except for those required (CHE 422/532/533/ [550 or 552]).

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From the Mathematics Department
MA 213 Calculus III ................................................................. 4
MA 322 Matrix Algebra and Its Applications ............................ 3

From the Physics Department
*PHY 231/232 General University Physics .................................. 8
*PHY 241/242 General University Physics Laboratory .................. 2

Other Major hours: ................................................................. 23

Total Minimum hours
Required for Degree .............................................................. 123

*Any language may be used to satisfy the College Foreign Language requirements – German is recommended.

*Course used towards completion of a UK Core Requirement.

Curriculum for B.S. in Chemistry

Traditional Option

Freshman Year

First Semester Hours
CHE 105 General College Chemistry I ........................................... 4
CHE 111 General Chemistry I Laboratory ........................................ 1
CIS/WRD 110 Composition and Communication I ......................... 3
MA 113 Calculus I ........................................................................ 4
UK 101 Academic Orientation ...................................................... 1
UK Core – Arts and Creativity ...................................................... 3

Second Semester
CHE 107 General College Chemistry II ........................................ 3
CHE 113 General Chemistry II Laboratory ..................................... 2
MA 114 Calculus II ...................................................................... 4
CIS/WRD 111 Composition and Communication II ....................... 3
UK Core – Humanities .............................................................. 3

Sophomore Year

First Semester Hours
CHE 226 Analytical Chemistry ..................................................... 3
CHE 230 Organic Chemistry I ....................................................... 3
MA 213 Calculus III .................................................................... 4
PHY 231 General University Physics .......................................... 4
PHY 241 General University Physics Laboratory .......................... 1

Second Semester
CHE 231 Organic Chemistry Laboratory ...................................... 1
CHE 232 Organic Chemistry II ..................................................... 3
MA 322 Matrix Algebra and Its Applications ................................. 3
PHY 232 General University Physics .......................................... 4
PHY 242 General University Physics Laboratory .......................... 1
UK Core – Social Sciences .......................................................... 3

Junior Year

First Semester Hours
CHE 532 Spectrometric Identification of Organic Molecules .......... 2
CHE 547 Principles of Physical Chemistry I .................................. 3
Foreign Language I* ................................................................ 4
STA 210 Making Sense of Uncertainty: An Introduction to Statistical Reasoning ......................................................... 3
A&S Humanities .................................................................. 3

Second Semester
CHE 410G Inorganic Chemistry .................................................. 2
CHE 441 Physical Chemistry Laboratory ...................................... 2
CHE 442G Thermodynamics and Kinetics .................................. 3
CHE 533 Advanced Organic Chemistry Laboratory ..................... 2
Foreign Language II* ............................................................... 4
UK Core – Citizenship - USA .................................................... 3

Senior Year

First Semester Hours
CHE 421 Inorganic Chemistry Laboratory .................................... 2
CHE 422 Instrumental Analysis ................................................... 4
CHE 550 Biological Chemistry I .................................................. 3
WRD 310 Writing in the Natural Sciences .................................... 3
Major Field Option ................................................................. 3
Foreign Language III* ............................................................ 3

Second Semester
Major Field Option ................................................................. 3
A&S Social Science ................................................................. 3
Electives ........................................................................... 6
UK Core – Global Dynamics .................................................... 3

*Any foreign language sequence satisfying the College of Arts and Sciences requirement in foreign languages may be taken. German is recommended.

Certification Requirements

The B.S. degree is certified by the American Chemical Society.