

# 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 that emphasizes materials chemistry. All three B.S. degrees 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.

### 124 hours (minimum)

Any student earning a Bachelor of Science (BS) 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 2024-2025 UK Catalog.

### UK Core Requirements

See the *UK Core* section of the 2024-2025 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

**Graduation Composition and Communication Requirement hours (GCCR)**..... **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

or

\*MA 137 Calculus I with Life Science Application .....4

MA 114 Calculus II

or

MA 138 Calculus II With Life Science Applications.....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**

– CONTINUED –

The University of Kentucky is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) to award associate, baccalaureate, masters, educational specialist, and doctorate degrees. The University of Kentucky also may offer credentials such as certificates and diplomas at approved degree levels. Questions about the accreditation of the University of Kentucky may be directed in writing to the Southern Association of Colleges and Schools Commission on Colleges at 1866 Southern Lane, Decatur, GA 30033-4097, by calling (404) 679-4500, or by using information available on SACSCOC's website ([www.sacscoc.org](http://www.sacscoc.org)).

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## Other Course Work Required for the Major

### From the Major Department:

|  |   |
|--|---|
| Chemistry Major Field Options .....  | 6 |
| Choose 6 hours from the following: CHE 395; or any CHE 500-level course except for those required. CHE 395 is strongly recommended for students having a minimum 3.0 GPA in chemistry courses. |   |

### 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 .....** 124

*^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     |
| <b>Second Semester</b>                             |       |
| 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 I .....        | 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:<br>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 412 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     |
| <b>Second Semester</b>                        |       |
| 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.