The Department of Chemistry provides several undergraduate degree programs for chemistry majors and general course offerings for non-majors. All B.S. chemistry degrees are designed to comply with American Chemical Society (ACS) standards and provide a strong foundation in chemistry that prepares students to be highly qualified to work as professional chemists, pursue advanced studies leading to the Ph.D. degree in chemistry or biochemistry, or gain admission to professional schools in medicine, dentistry, optometry, pharmacy, as well as forensic chemists in regional, state, and federal forensic laboratories, work as professional chemists in industrial or government laboratories, or pursue certification to be chemistry educators. Students must accumulate 400 hours of pre-approved laboratory experiences beyond general chemistry in order for their degree to qualify for an ACS certificate.

The department offers the following ACS-approved B.S. degrees in chemistry as well as a minor in chemistry:

1. Major in Chemistry
2. Major in Chemistry with a Biochemistry Track
3. Major in Chemistry with a Chemical Education Track
4. Major in Chemistry with a Forensic Chemistry Track
5. Major in Chemistry with a Polymer Chemistry Track

The B.S. degree in chemistry with a biochemistry track, or a B.S. degree in chemistry, with biology as a minor, is recommended for students with career interests in medicine, dentistry, optometry, pharmacy, or other health-related fields. Students whose interests include careers in federal, state, or local forensic laboratories are encouraged to obtain a degree in chemistry with the forensic chemistry track.

The required curricula associated with the B.S. degree in chemistry with available options, and a suggested program of study, are available from the Department of Chemistry Advising Office and on the Department of Chemistry website (www.uab.edu/chemistry).

An exciting feature of the Department of Chemistry’s B.S. degree is the opportunities for undergraduate chemistry majors to participate in world-class research programs. Students are encouraged to become involved in research early in their undergraduate careers. Students are engaged in all aspects of meaningful and significant research programs that cover a variety of projects and encompass every area of chemistry, and biochemistry, and extend into interdisciplinary programs within the UAB biomedical research complex. Students demonstrating success in their research projects are encouraged to present their work at regional and national scientific meetings and are supported by departmental travel scholarships.

All students majoring in chemistry are required to meet with the Undergraduate Advisor (Mr. James Grimes) each term prior to registration. The advisor’s contact information is chemadvise@uab.edu or 205-934-7529.

Grade Point Average

At least a 2.0 average for all required chemistry courses and a 2.0 average for all required chemistry courses taken at UAB are compulsory for either a major or minor in chemistry. The current UAB course repeat policy and course forgiveness policy will be used in calculating the grade point average. Courses taken on a pass/fail basis do not count toward a CH minor.

Transfer Credit / Residency

All chemistry minors must take at least two of the following courses (with laboratories) at UAB, and at least one of these courses with laboratory must be at the 200 level or higher: CH 235/CH 236, CH 237/CH 238, CH 235, CH 345, CH 333, CH 355/CH 355L, CH 426, CH 440, CH 444, CH 450, CH 460, CH 480/CH 480L, or CH 481/CH 481L. Chemistry majors must also take CH 493 or CH 495 at UAB, and at least two of these courses at UAB (if not already satisfied by the residency requirement mentioned above): CH 333, CH 426, CH 440, CH 444, CH 463 or CH 464, CH 480/CH 480L, CH 481/CH 481L, or CH 497 (which can only count once, for three credit hours, toward this requirement). Students will not be given more semester-hours credit toward the major or minor than awarded for equivalent courses at UAB. Chemistry credit from another institution cannot be applied toward requirements for a chemistry major or minor at UAB if the grade is W, WP, WF, D, or F. Courses taken through the Cooperative Exchange Program must be approved in advance and in writing by the chemistry department chair in order for courses to apply toward requirements for a chemistry major or minor.

Core Curriculum for Chemistry

Refer to Core Curriculum

Graduate Programs

The Department of Chemistry offers graduate study leading to the degrees of Doctor of Philosophy and Master of Science. Further information may be obtained from the Graduate Program Director of the Department of Chemistry, the UAB Graduate School Catalog, or the departmental web site (http://www.uab.edu/chemistry).

5th year master’s degree in biochemistry

This is a research intensive degree program and to be eligible for admission in the senior year, students must start their undergraduate research experience as early as possible, preferably in their sophomore year.

Admission Requirements:

- achieved status of Senior chemistry major
- GPA of 3.0 or higher
- enrolled in CHEM 497 (Introduction to Undergraduate Research) by the Fall semester of the Junior year
- selection of faculty research mentor (in the Department of Chemistry or Department of Biochemistry & Molecular Genetics) by Spring semester of the Junior year and enroll in CHEM 497 (Undergraduate Research) by Spring semester of the Junior year

Admission to the 5th-year MS program will additionally require:

- satisfactory performance on Graduate Record Exam (GRE) taken in the Senior year (first term)
Department of Chemistry

- strong letter of nomination for admission to the program from their undergraduate research mentor

The 5th-year M.S. Chemistry/Biochemistry Oversight Committee, composed of two faculty members from the Department of Chemistry (including the Department of Chemistry Graduate Program Director) and two faculty members from the Department of Biochemistry (GBS-BSSB theme including the GBS-BSSB Graduate Program Director) will review applicants and approve admission to the program.

Bachelor of Science with a Major in Chemistry

Required Courses in Core Curriculum

Students, in consultation with their academic advisor, must sequence requirements to meet any stated prerequisite requirements for specific courses in their curriculum, including UAB Core Curriculum requirements stated in this catalog. These courses are required for this major and can also fulfill core curriculum requirements:

Area III Sciences: CH 115, CH 116, CH 117, CH 118, or CH 125, CH 126, CH 127, CH 128

Area III Mathematics: MA 125, or MA 225

Requirements Hours
Mathematics Requirement 4
MA 126/226 Calculus II

Physics
Select one of the following: 8
PH 201 College Physics I
& PH 202 and College Physics II
PH 221 General Physics I
& PH 222 and General Physics II 1

Chemistry Requirements
Organic Chemistry 8
CH 235/245 Organic Chemistry I
CH 236/246 Organic Chemistry I Laboratory
CH 237/247 Organic Chemistry II
CH 238/248 Organic Chemistry II Laboratory

Analytical / Inorganic / Physical Chemistry 12
CH 325 Physical Chemistry I with Calculus: Thermodynamics and Chemical Kinetics
CH 333 Synthetic and Physical Laboratory Methods
CH 345 Inorganic Chemistry: Principles and Applications of Chemical Periodicity
CH 355 & 355L Quantitative Analysis and Quantitative Analysis Laboratory

Physical/Transition Metal/Instrumental Chemistry
Select upper division lab: 2
CH 444 Spectroscopic and Separations Laboratory Methods
Select one of the following: 3
CH 426 Physical Chemistry II: Structure/Bonding and Molecular Spectroscopy 2
CH 440 Transition Metal Chemistry 2
CH 450 Instrumental Analysis 2

Biochemistry 3
CH 460 Fundamentals of Biochemistry

Chemistry Electives
Select one of the following: 3-6

CH 426 Physical Chemistry II: Structure/Bonding and Molecular Spectroscopy 2
CH 430 Physical Organic Chemistry
CH 440 Transition Metal Chemistry 2
CH 450 Instrumental Analysis 2
CH 451 Chemometrics
CH 461 Advanced Biochemistry
CH 463 Biochemistry Laboratory
CH 464 Physical Biochemistry Laboratory
CH 471 Medicinal Chemistry and Drug Discovery
CH 472 Chemistry of Natural Products
CH 480 Polymer Chemistry I. Basic Principles
CH 481 Polymer Chemistry II. Fundamental Properties
CH 497 Undergraduate Research (two terms strongly recommended)

Capstone Requirement
Select one of the following: 3-4
CH 493 Chemistry in Culture & Ethics
or CH 495 & CH 497 Ethics in Chemical Research and Undergraduate Research

Total Hours 46-50

1 The calculus-based PH 221 - PH 222 sequence is strongly recommended.
2 Each of these courses can only count once toward the chemistry major.

GPA Requirement

• At least a 2.0 average in all required chemistry courses and a 2.0 average in all required chemistry courses taken at UAB are mandatory for a major in chemistry.
• The current UAB course forgiveness policy will be used in calculating the grade point average.

Additional Requirements

Requirements Hours
General Electives 15-19
Students must take general electives (and the FYE/FLC requirement, if applicable) to reach the 120 semester hour requirement.

Total Hours 15-19

Bachelor of Science with a Major in Chemistry and a Biochemistry Track

Required Courses in Core Curriculum

Students, in consultation with their academic advisor, must sequence requirements to meet any stated prerequisite requirements for specific courses in their curriculum, including UAB Core Curriculum requirements stated in this catalog. These courses are required for this major and can also fulfill core curriculum requirements:

Area III Sciences: CH 115, CH 116, CH 117, CH 118, or CH 125, CH 126, CH 127, CH 128

Area III Mathematics: MA 125, or MA 225
Requirements | Hours
--- | ---
**Mathematics Requirements** | 4
MA 126/226 Calculus II

**Biology** | 8
BY 123 Introductory Biology I
BY 124 Introductory Biology II

**Biology**
Select one of the following: 3-4
BY 210 Genetics
BY 271 Biology of Microorganisms
BY 330 Cell Biology

**Physics**
Select one of the following: 8
PH 201 College Physics I
& PH 202 and College Physics II
PH 221 General Physics I
& PH 222 and General Physics II

**Organic Chemistry** | 8
CH 235/245 Organic Chemistry I
CH 236/246 Organic Chemistry I Laboratory
CH 237/247 Organic Chemistry II
CH 238/248 Organic Chemistry II Laboratory

**Analytical/Inorganic/Physical Chemistry** | 12
CH 325 Physical Chemistry I with Calculus: Thermodynamics and Chemical Kinetics
CH 345 Inorganic Chemistry: Principles and Applications of Chemical Periodicity
CH 333 Synthetic and Physical Laboratory Methods
CH 355 Quantitative Analysis
& 355L and Quantitative Analysis Laboratory

**Physical/Transition Metal/Instrumental Chemistry**
Select one of the following: 2
CH 444 Spectroscopic and Separations Laboratory Methods

Select one of the following: 3
CH 426 Physical Chemistry II: Structure/Bonding and Molecular Spectroscopy
CH 440 Transition Metal Chemistry
CH 450 Instrumental Analysis

**Biochemistry** | 3
CH 460 Fundamentals of Biochemistry
CH 461 Advanced Biochemistry

**Biochemistry Elective**
Select one of the following: 3
CH 463 Biochemistry Laboratory
CH 464 Physical Biochemistry Laboratory

**Capstone Requirement**
Select one of the following: 3-4
CH 493 Chemistry in Culture & Ethics
or CH 495 Ethics in Chemical Research
& CH 497 and Undergraduate Research

GPA Requirement
- At least a 2.0 average in all required chemistry courses and a 2.0 average in all required chemistry courses taken at UAB are mandatory for a major in chemistry.

**Additional Requirements**

**Requirements** | Hours
--- | ---
**General Electives**
Students must take general electives (and the FYE/FLC requirement, if applicable) to reach the 120 semester hour requirement. | 15-19

**Total Hours** | 15-19

**Bachelor of Science with a Major in Chemistry and a Forensic Chemistry Track**

**Required Courses in Core Curriculum**
Students, in consultation with their academic advisor, must sequence requirements to meet any stated prerequisite requirements for specific courses in their curriculum, including UAB Core Curriculum requirements stated in this catalog. These courses are required for this major and can also fulfill core curriculum requirements:

**Area II (non-Literature option)**: CMST 101

**Area III Sciences**: CH 115, CH 116, CH 117, CH 118, or CH 125, CH 126, CH 127, CH 128

**Area III Mathematics**: MA 125, or MA 225

**Requirements** | Hours
--- | ---
**Mathematics Requirements** | 4
MA 126/225 Calculus II

**Biology** | 17
BY 123 Introductory Biology I
BY 124 Introductory Biology II
BY 210 Genetics
BY 311 Molecular Genetics
BY 429 Evolution
or BY 431 Principles of DNA Technology

**Physics**
Select one of the following: 8
PH 201 College Physics I
& PH 202 and College Physics II
PH 221 General Physics I
& PH 222 and General Physics II

**Organic Chemistry** | 8
CH 235/245 Organic Chemistry I
CH 236/246 Organic Chemistry I Laboratory
CH 237/247 Organic Chemistry II
CH 238/248 Organic Chemistry II Laboratory

**Analytical/Inorganic/Physical Chemistry** | 20
CH 325 Physical Chemistry I with Calculus: Thermodynamics and Chemical Kinetics
CH 333 Synthetic and Physical Laboratory Methods
CH 345 Inorganic Chemistry: Principles and Applications of Chemical Periodicity
CH 355 Quantitative Analysis
& 355L and Quantitative Analysis Laboratory
CH 426 Physical Chemistry II: Structure/Bonding and Molecular Spectroscopy

1 The calculus based PH 221 & PH 222 is strongly recommended.

1 The current UAB course forgiveness policy will be used in calculating the grade point average.

**Department of Chemistry**

1 The calculus based PH 221 & PH 222 is strongly recommended.
## Required Courses in Core Curriculum

Students, in consultation with their academic advisor, must sequence requirements to meet any stated prerequisite requirements for specific courses in their curriculum, including UAB Core Curriculum requirements stated in this catalog. **These courses are required for this major and can also fulfill core curriculum requirements:**

| Area III Sciences: CH 115, CH 116, CH 117, CH 118, or CH 125, CH 126, CH 127, CH 128 |
| Area III Mathematics: MA 125, or MA 225 |

## GPA Requirement

- At least a 2.0 average in all required chemistry courses and a 2.0 average in all required chemistry courses taken at UAB are mandatory for a major in chemistry.
- The current UAB course forgiveness policy will be used in calculating the grade point average.

## Additional Requirements

### FYE/FLC Requirement

Students must also fulfill the FYE/FLC Requirement, if applicable.

**Bachelor of Science with a Major in Chemistry and a Chemical Education Track**

## Physics

Select one of the following: 8

| PH 201 | College Physics I |
| PH 202 | College Physics II |
| PH 221 | General Physics I |
| PH 222 | General Physics II |

## Organic Chemistry

8

| CH 235/245 | Organic Chemistry I |
| CH 236/246 | Organic Chemistry I Laboratory |
| CH 237/247 | Organic Chemistry II |
| CH 238/248 | Organic Chemistry II Laboratory |

## Analytical/Inorganic Chemistry

7

| CH 345 | Inorganic Chemistry: Principles and Applications of Chemical Periodicity |
| CH 355 | Quantitative Analysis |
| 355L | Quantitative Analysis Laboratory |

## Physical Chemistry

Select one of the following: 2

| CH 333 | Synthetic and Physical Laboratory Methods |
| CH 444 | Spectroscopic and Separations Laboratory Methods |

Select one of the following: 3

| CH 325 | Physical Chemistry I with Calculus: Thermodynamics and Chemical Kinetics |
| CH 426 | Physical Chemistry II: Structure/Bonding and Molecular Spectroscopy |

## Biochemistry

3

| CH 460 | Fundamentals of Biochemistry |

## Chemistry Electives

Select one of the following: 3-6

| CH 325 | Physical Chemistry I with Calculus: Thermodynamics and Chemical Kinetics |
| CH 426 | Physical Chemistry II: Structure/Bonding and Molecular Spectroscopy |
| CH 440 | Transition Metal Chemistry |
| CH 450 | Instrumental Analysis |
| CH 451 | Chemometrics |
| CH 459 | Special Topics in Analytical Chemistry |
| CH 461 | Advanced Biochemistry |
| CH 463 | Biochemistry Laboratory |
| CH 464 | Physical Biochemistry Laboratory |
| CH 471 | Medicinal Chemistry and Drug Discovery |
| CH 472 | Chemistry of Natural Products |
| CH 480 | Polymer Chemistry I: Basic Principles |
| CH 481 | Polymer Chemistry II: Fundamental Properties |
| CH 497 | Undergraduate Research (two terms strongly recommended) |

## Chemistry Teaching Methods

3

| CH 498 | Chemistry Teaching Methods |

## Capstone Requirement

Select one of the following: 3-4

| CH 493 | Chemistry in Culture & Ethics |
| 495 | Ethics in Chemical Research |
| 497 & Undergraduate Research |

Total Hours: 44-48

1. The calculus based sequence PH 221-PH 222 is strongly recommended.
Each of these courses can only count once toward the chemistry major.

This program alone **DOES NOT** lead to certification to teach chemistry. **Advising in the School of Education is STRONGLY recommended.**

### GPA Requirement

- At least a 2.0 average in all required chemistry courses and a 2.0 average in all required chemistry courses taken at UAB are mandatory for a major in chemistry.
- The current UAB course forgiveness policy will be used in calculating the grade point average.

### Additional Requirements

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Electives</td>
<td>Any required chemistry courses (and the FYE/FLC requirement, if applicable) to reach the 120 semester hour requirement.</td>
</tr>
</tbody>
</table>

**Total Hours:** 29-35

---

**Bachelor of Science with a Major in Chemistry and a Polymer Chemistry Track**

**Required Courses in Core Curriculum**

Students, in consultation with their academic advisor, must sequence requirements to meet any stated prerequisite requirements for specific courses in their curriculum, including UAB Core Curriculum requirements stated in this catalog. **These courses are required for this major and can also fulfill core curriculum requirements:**

| Area III Sciences: | CH 115, CH 116, CH 117, CH 118, or CH 125, CH 126, CH 127, CH 128 |
| Area III Mathematics: | MA 125, or MA 225 |

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Mathematics Requirement</td>
<td>MA 126/226 Calculus II</td>
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<tr>
<td>Physics</td>
<td>8</td>
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<tr>
<td>Select one of the following:</td>
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</tr>
<tr>
<td>PH 201 College Physics I &amp; PH 202 College Physics II</td>
<td></td>
</tr>
<tr>
<td>PH 221 General Physics I &amp; PH 222 General Physics II</td>
<td></td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>8</td>
</tr>
<tr>
<td>CH 235/245 Organic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>CH 236/246 Organic Chemistry I Laboratory</td>
<td></td>
</tr>
<tr>
<td>CH 237/247 Organic Chemistry II</td>
<td></td>
</tr>
<tr>
<td>CH 238 Organic Chemistry II Laboratory or CH 248 Organic Chemistry II Laboratory (Honors)</td>
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</table>

| Analytical/Inorganic/Physical Chemistry | 12 |
| CH 325 Physical Chemistry I with Calculus: Thermodynamics and Chemical Kinetics |
| CH 333 Synthetic and Physical Laboratory Methods |
| CH 345 Inorganic Chemistry: Principles and Applications of Chemical Periodicity |

### Sample Program of Study for a Major in Chemistry

**ACS Approved**

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 115 or 125</td>
<td>3</td>
<td>CH 117 or 127</td>
<td>3</td>
</tr>
<tr>
<td>CH 116 or 126</td>
<td>1</td>
<td>CH 118 or 128</td>
<td>1</td>
</tr>
<tr>
<td>EH 101</td>
<td>3</td>
<td>EH 102</td>
<td>3</td>
</tr>
<tr>
<td>MA 125 or 225</td>
<td>4</td>
<td>MA 126 or 226</td>
<td>4</td>
</tr>
</tbody>
</table>
### Sample Program of Study for a Major in Chemistry with a Biochemistry Track

**ACS Approved**

<table>
<thead>
<tr>
<th>Freshman</th>
<th>First Term</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FYE Course (hours may vary)</td>
<td>1 CH 117 or 127</td>
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<td></td>
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</tr>
<tr>
<td>CH 115 or 125</td>
<td>3 CH 118 or 128</td>
<td>1</td>
<td></td>
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<tr>
<td>CH 116 or 126</td>
<td>1 BY 123</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA 125 or 225</td>
<td>4 BY 123L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EH 101</td>
<td>3 MA 126 or 226</td>
<td>4</td>
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<td></td>
</tr>
<tr>
<td>Core Curriculum (e.g., HY 101)</td>
<td>3 EH 102</td>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td>FYE (credit hours may vary)</td>
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### Sophomore

<table>
<thead>
<tr>
<th>First Term</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
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<tr>
<td>CH 235 or 245</td>
<td>3 CH 237 or 247</td>
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<tr>
<td>CH 236 or 246</td>
<td>1 CH 238 or 248</td>
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<tr>
<td>PH 221 (^2)</td>
<td>4 PH 222</td>
<td>4</td>
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</tr>
<tr>
<td>PH 221L</td>
<td>PH 222L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PH 221R</td>
<td>PH 222R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Core Curriculum (e.g., EH 213)</td>
<td>3 Core Curriculum (e.g., PY 101)</td>
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<tr>
<td>Core Curriculum (e.g., SOC 100)</td>
<td>3 Core Curriculum (e.g., HY 102)</td>
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<tr>
<td>Electives</td>
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### Junior

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<th>First Term</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 345</td>
<td>3 CH 355 &amp; 355L</td>
<td>4</td>
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</tr>
<tr>
<td>CH Elective (400 level) (^1)</td>
<td>3 Core Curriculum (e.g., PHL 116)</td>
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<tr>
<td>Core Curriculum (e.g., THR 100)</td>
<td>3 Electives</td>
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<tr>
<td>Electives</td>
<td>Electives</td>
<td>2</td>
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### Senior

<table>
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<tr>
<th>First Term</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 325</td>
<td>3 CH 426 or 440 (^3)</td>
<td>3</td>
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</tr>
<tr>
<td>CH 333</td>
<td>2 CH 444</td>
<td>2</td>
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</tr>
<tr>
<td>CH 460</td>
<td>3 CH 493</td>
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</tr>
<tr>
<td>Electives</td>
<td>7 Electives</td>
<td>8</td>
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</tbody>
</table>

### Total credit hours: 120

1. See GPS for list of courses that can satisfy core and/or major requirements.
2. The calculus-based physics sequence, PH 221 & PH 222, is strongly recommended instead of the PH 201 & PH 202 sequence.
3. CH 450 can substitute for CH 426 or CH 440.

### Sample Program of Study for a Major in Chemistry with a Chemical Education Track

**ACS Approved**

<table>
<thead>
<tr>
<th>Freshman</th>
<th>First Term</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>FYE Course (hours may vary)</td>
<td>1 CH 117 or 127</td>
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<td>CH 115 or 125</td>
<td>3 CH 118 or 128</td>
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<td>CH 116 or 126</td>
<td>1 BY 123</td>
<td>4</td>
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</tr>
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<td>MA 125 or 225</td>
<td>4 BY 123L</td>
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<td>EH 101</td>
<td>3 MA 126 or 226</td>
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<td></td>
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</tr>
<tr>
<td>Core Curriculum (e.g., HY 101) (^1)</td>
<td>3 EH 102</td>
<td>3</td>
<td></td>
<td></td>
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</table>

### Sophomore

<table>
<thead>
<tr>
<th>First Term</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 235 or 245</td>
<td>3 CH 237 or 245</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CH 236 or 246</td>
<td>1 CH 238 or 248</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BY 124</td>
<td>4 PH 221 (^2)</td>
<td>4</td>
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<tr>
<td>BY 124L</td>
<td>PH 221L</td>
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<tr>
<td>Core Curriculum (e.g., EH 213)</td>
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<tr>
<td>Core Curriculum (e.g., THR 100)</td>
<td>3 Core Curriculum (e.g., PHL 116)</td>
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<tr>
<td>Core Curriculum (e.g., HY 101)</td>
<td>3 Core Curriculum (e.g., HY 102)</td>
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</tr>
<tr>
<td>Elective</td>
<td>Elective</td>
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### Junior

<table>
<thead>
<tr>
<th>First Term</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 345</td>
<td>3 CH 355 &amp; 355L</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CH 460</td>
<td>3 CH 461 (^5)</td>
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</tr>
<tr>
<td>PH 222 (^2)</td>
<td>4 CH 464</td>
<td>3</td>
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<tr>
<td>PH 222L</td>
<td>BY 210 (^3)</td>
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<tr>
<td>PH 222R</td>
<td>Core Curriculum (e.g., SOC 100)</td>
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<td>Electives</td>
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### Senior

<table>
<thead>
<tr>
<th>First Term</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 325</td>
<td>3 CH 426 or 440 (^4)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CH 333</td>
<td>2 CH 444</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Core Curriculum (e.g., CMST 101)</td>
<td>3 CH 493</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>7 Electives</td>
<td>4</td>
<td></td>
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</tbody>
</table>

### Total credit hours: 120

1. See GPS for list of courses that can satisfy core and/or major requirements.
2. The calculus-based physics sequence, PH 221 & PH 222, is strongly recommended instead of the PH 201 & PH 202 sequence.
3. May also choose BY 330 or BY 271/BY 271L.
4. CH 450 may substitute for CH 426 or CH 440.
5. CH 483 may substitute for CH 464.

### Sample Program of Study for a Major in Chemistry with a Chemical Education Track

**ACS Approved**

<table>
<thead>
<tr>
<th>Freshman</th>
<th>First Term</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>FYE (Credit hours may vary)</td>
<td>1 Core Curriculum (e.g., PHL 115)</td>
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### Sophomore

<table>
<thead>
<tr>
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<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CH 115 or 125</td>
<td>3 CH 117 or 127</td>
<td>3</td>
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</tr>
<tr>
<td>CH 116 or 126</td>
<td>1 CH 118 or 128</td>
<td>1</td>
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<tr>
<td>MA 125 or 225</td>
<td>4 MA 126 or 226</td>
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<td>EH 101</td>
<td>3 EH 102</td>
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<td>FYE (credit hours may vary)</td>
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### Junior

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<thead>
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<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CH 345</td>
<td>3 CH 355 &amp; 355L</td>
<td>4</td>
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<tr>
<td>CH 460</td>
<td>3 CH 461 (^5)</td>
<td>3</td>
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</tr>
<tr>
<td>PH 222 (^2)</td>
<td>4 CH 464</td>
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<tr>
<td>PH 222L</td>
<td>BY 210 (^3)</td>
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<td>PH 222R</td>
<td>Core Curriculum (e.g., SOC 100)</td>
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### Senior

<table>
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<tr>
<th>First Term</th>
<th>Hours</th>
<th>Second Term</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 325</td>
<td>3 CH 426 or 440 (^4)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CH 333</td>
<td>2 CH 444</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Core Curriculum (e.g., CMST 101)</td>
<td>3 CH 493</td>
<td>3</td>
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<tr>
<td>Electives</td>
<td>7 Electives</td>
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### Total credit hours: 120
### Core Curriculum (e.g. HY 101)

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CH 235 or 245</td>
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<td>CH 237 or 247</td>
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<tr>
<td>CH 236 or 246</td>
<td>1</td>
<td>CH 238 or 248</td>
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</tr>
<tr>
<td>PH 221</td>
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<td>PH 222</td>
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</tr>
<tr>
<td>&amp; 221R &amp; 222L²</td>
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<td>&amp; 222R &amp; 222L²</td>
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<tr>
<td>Core Curriculum (e.g. EH 213)¹</td>
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<td>Core Curriculum (e.g. CMST 101)¹</td>
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<td>Core Curriculum (e.g. THR 100)¹</td>
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<td>Elective</td>
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### Junior

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Hours</th>
<th>Sophomore</th>
<th>Hours</th>
<th>Junior</th>
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</thead>
<tbody>
<tr>
<td>CH 345</td>
<td>3</td>
<td>CH 355</td>
<td>4</td>
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<tr>
<td>&amp; 355L</td>
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<td>&amp; 355L</td>
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<tr>
<td>CH 460</td>
<td>3 Chemistry Elective (400 level)¹</td>
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<td>Core Curriculum (e.g. ANTH 101)¹</td>
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<td>PH 221 &amp; 222R &amp; 222L²</td>
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<tr>
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<td></td>
<td>14</td>
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<td>&amp; 222R &amp; 222L²</td>
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<tr>
<td></td>
<td>14</td>
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<td></td>
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<table>
<thead>
<tr>
<th>Senior</th>
<th>Hours</th>
<th>Senior</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CH 325³</td>
<td>3 CH 498</td>
<td>3</td>
<td>CH 325</td>
</tr>
<tr>
<td>CH 333</td>
<td>2 CH 493</td>
<td>3</td>
<td>CH 333</td>
</tr>
<tr>
<td>Electives</td>
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<td>CH 450</td>
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</tbody>
</table>

Total credit hours: 120

This program alone DOES NOT lead to certification to teach chemistry. Advising in the School of Education is STRONGLY recommended.

¹ See GPS for list of courses that can satisfy core and/or major requirements.
² The calculus-based physics sequence, PH 221 and PH 222, is strongly recommended, instead of the PH 201 and PH 202 sequence.
³ CH 426/440 can substitute for CH 325/333

### Sample Program of Study for a Major in Chemistry with a Forensic Chemistry Track

**ACS Approved**

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Hours</th>
<th>Sophomore</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 115 or 125</td>
<td>3 CH 117 or 127</td>
<td>3</td>
<td>CH 235 or 245</td>
</tr>
<tr>
<td>CH 116 or 126</td>
<td>1 CH 118 or 128</td>
<td>1</td>
<td>CH 236 or 246</td>
</tr>
<tr>
<td>MA 125 or 225</td>
<td>4 MA 126 or 226</td>
<td>4</td>
<td>CJ 302</td>
</tr>
<tr>
<td>EH 101</td>
<td>3 EH 102</td>
<td>3</td>
<td>BY 124</td>
</tr>
<tr>
<td>CJ 110</td>
<td>3 BY 123</td>
<td>4</td>
<td>BY 124L</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Core Curriculum (e.g. EH 213)¹</td>
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<tr>
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<td></td>
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<td>Core Curriculum (e.g. HY 101)¹</td>
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<td></td>
<td>Core Curriculum (e.g. SOC 100)¹</td>
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</table>

### Sample Program of Study for a Major in Chemistry with a Polymer Chemistry Track

**ACS Approved**

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Hours</th>
<th>Sophomore</th>
<th>Hours</th>
<th>Junior</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 115 or 125</td>
<td>3 CH 117 or 127</td>
<td>3</td>
<td>CH 235 or 245</td>
<td>3 CH 237 or 247</td>
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</tr>
<tr>
<td>CH 116 or 126</td>
<td>1 CH 118 or 128</td>
<td>1</td>
<td>CH 236 or 246</td>
<td>1 CH 238 or 248</td>
<td>1</td>
</tr>
<tr>
<td>MA 125 or 225</td>
<td>4 MA 126 or 226</td>
<td>4</td>
<td>CJ 302</td>
<td>3 CH 210</td>
<td>3</td>
</tr>
<tr>
<td>EH 101</td>
<td>3 EH 102</td>
<td>3</td>
<td>BY 124</td>
<td>4 CJ 250 or 350</td>
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<tr>
<td>CJ 110</td>
<td>3 BY 123</td>
<td>4</td>
<td>BY 124L</td>
<td>Core Curriculum (e.g. PHL 116)¹</td>
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<td>Core Curriculum (e.g. EH 213)¹</td>
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<td>Core Curriculum (e.g. HY 101)¹</td>
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<td>Core Curriculum (e.g. SOC 100)¹</td>
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</table>

Total credit hours: 124-125

¹ See GPS for list of courses that can satisfy core and/or major requirements.
² The calculus-based physics sequence, PH 221 and PH 222, is strongly recommended, instead of the PH 201 and PH 202 sequence.
³ CH 463 can substitute for CH 464.
### Minor in Chemistry

#### Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CH 115</td>
<td>General Chemistry I</td>
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</tr>
<tr>
<td>CH 116</td>
<td>General Chemistry I Laboratory</td>
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<tr>
<td>CH 117</td>
<td>General Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CH 118</td>
<td>General Chemistry II Laboratory</td>
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</tr>
<tr>
<td>CH 235</td>
<td>Organic Chemistry I</td>
<td>3</td>
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<tr>
<td>CH 236</td>
<td>Organic Chemistry I Laboratory</td>
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</tr>
<tr>
<td>CH 237</td>
<td>Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CH 238</td>
<td>Organic Chemistry II Laboratory</td>
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<tr>
<td>CH 325</td>
<td>Physical Chemistry I with Calculus: Thermodynamics and Chemical Kinetics</td>
<td>3-4</td>
</tr>
<tr>
<td>CH 345</td>
<td>Inorganic Chemistry: Principles and Applications of Chemical Periodicity</td>
<td>3-4</td>
</tr>
<tr>
<td>CH 355</td>
<td>Quantitative Analysis</td>
<td>3-4</td>
</tr>
<tr>
<td>CH 426</td>
<td>Physical Chemistry II: Structure/Bonding and Molecular Spectroscopy</td>
<td>3-4</td>
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<tr>
<td>CH 440</td>
<td>Transition Metal Chemistry</td>
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<td>CH 450</td>
<td>Instrumental Analysis</td>
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<td>CH 451</td>
<td>Chemometrics</td>
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<tr>
<td>CH 459</td>
<td>Special Topics in Analytical Chemistry</td>
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<tr>
<td>CH 460</td>
<td>Fundamentals of Biochemistry</td>
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<tr>
<td>CH 461</td>
<td>Advanced Biochemistry</td>
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<tr>
<td>CH 463</td>
<td>Biochemistry Laboratory</td>
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<tr>
<td>CH 464</td>
<td>Physical Biochemistry Laboratory</td>
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</tr>
<tr>
<td>CH 471</td>
<td>Medicinal Chemistry and Drug Discovery</td>
<td>3-4</td>
</tr>
<tr>
<td>CH 472</td>
<td>Chemistry of Natural Products</td>
<td>3-4</td>
</tr>
<tr>
<td>CH 480</td>
<td>Polymer Chemistry I. Basic Principles</td>
<td>3-4</td>
</tr>
<tr>
<td>CH 481</td>
<td>Polymer Chemistry II. Fundamental Properties</td>
<td>3-4</td>
</tr>
</tbody>
</table>

**Total Hours: 120**

1. See GPS for list of courses that can satisfy core and/or major requirements.
2. The calculus-based physics sequence, PH 221 & PH 222, is strongly recommended, instead of the PH 201 & PH 202 sequence.
3. CH 450 can substitute for CH 426 or 440.

### GPA and Residency Requirement

- At least a 2.0 average in required chemistry courses and a 2.0 average in required chemistry courses taken at UAB are mandatory for a minor in chemistry.
- The current UAB course forgiveness policy will be used in calculating the grade point average.
- Chemistry courses in which a grade of W, WP, WF, D or F is earned at another institution cannot be applied toward requirements for the chemistry major or minor.
- Students will not be given more semester-hours credit toward the major or minor than awarded for equivalent courses at UAB.
- All chemistry minors must take at least two of the following courses (at least one with its accompanying laboratory) at UAB: CH 235/CH 236, CH 237/CH 238, CH 325/CH 333, CH 345/CH 333, CH 355/CH 355L, CH 426/CH 444 or CH 440, CH 450/CH 444, CH 460, CH 480/CH 480L, or CH 481/CH 481L.
- Courses taken on a pass/fail basis do not count toward a CH minor.

### Honors Program in Chemistry

#### Purpose

The Chemistry Honors Program is aimed toward outstanding chemistry majors and is designed to enhance the students' problem solving, critical thinking, and communication skills. The program provides an excellent preparation for graduate school or professional careers.

#### Eligibility

Acceptance into the Chemistry Honors Program requires the student to:

- Have earned a 3.25 GPA in required chemistry courses attempted;
- Have earned a 3.0 GPA overall;
**Courses**

**CH 100. Chemical Problem Solving. 3 Hours.**
Development of quantitative skills and introduction to basic chemical concepts to prepare students for CH 115. Successful completion of MA 098 or more advanced math, or placement in a more advanced math, is strongly recommended prior to taking this course.

**Prerequisites:** MAAD 15 or MA 098 [Min Grade: P] or MA 098 [Min Grade: C] or MA 102 [Min Grade: D](Can be taken Concurrently) or MA 105 [Min Grade: D](Can be taken Concurrently) or MA 106 [Min Grade: D](Can be taken Concurrently) or MA 110 [Min Grade: D](Can be taken Concurrently) or MA 125 [Min Grade: D](Can be taken Concurrently) or MA 225 [Min Grade: D](Can be taken Concurrently) or MTH1 75 or MTH2 75 or MTH3 75 or MTH4 75 or MTH5 75 or MA1 75 or MA2 75 or MA3 75 or MA4 75 or MA5 75 or MPL 30

**CH 105. Introductory Chemistry I. 3 Hours.**
Fundamental facts, principles, theory, and applications of chemistry. Qualitative in nature; for non-science majors and nursing students with no previous background in chemistry. Writing assignments structured to build on scientific reasoning. Not applicable to a major or minor in chemistry. Quantitative Literacy is a significant component of this course. This course, when taken with its corresponding laboratory, meets the Core Curriculum requirements for Area III: Natural Sciences. Concurrent enrollment in CH 105R Introductory Chemistry I Recitation required.

**Prerequisites:** MA 098 [Min Grade: P] or MA 098 [Min Grade: C] or MA 102 [Min Grade: D](Can be taken Concurrently) or MA 105 [Min Grade: D](Can be taken Concurrently) or MA 106 [Min Grade: D](Can be taken Concurrently) or MA 110 [Min Grade: D](Can be taken Concurrently) or MA 125 [Min Grade: D](Can be taken Concurrently) or MAAD 15 or MTH1 75 or MTH2 75 or MTH3 75 or MTH4 75 or MTH5 75 or MA1 75 or MA2 75 or MA3 75 or MA4 75 or MA5 75 or MPL 30 or EMA E

**CH 105R. Introductory Chemistry I Recitation. 0 Hours.**
Introductory Chemistry I recitation is used to build problem-solving skills in a study-group environment. Included in these sections are homework, quizzes, lecture related problems, and exams. Concurrent enrollment in CH 105 Introductory Chemistry I required.

**CH 106. Introductory Chemistry I Laboratory. 1 Hour.**
Emphasizes development of lab skills and demonstration of chemical principles covered in CH 105. Writing assignments structured to build on scientific reasoning. Not applicable to a major or minor in chemistry. Quantitative Literacy is a significant component of this course. Concurrent enrollment in or prior completion of CH 105 strongly recommended.

**CH 107. Introductory Chemistry II. 3 Hours.**
Fundamental organic and biochemistry. The second part of the chemistry sequence for non-science majors and nursing students. Covers concepts of organic chemistry and biochemistry. Emphasis on molecules involved in life processes. Writing assignments structured to build on scientific reasoning. Not applicable to a major or minor in chemistry. Quantitative Literacy is a significant component of this course. This course, when taken with its corresponding laboratory, meets the Core Curriculum requirements for Area III: Natural Sciences. Concurrent enrollment in CH 107R Introductory Chemistry II Recitation is required.

**Prerequisites:** CH 105 [Min Grade: C] or CH 115 [Min Grade: C]

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**Requirements**

- Have completed the following courses:
  - **CH 115** General Chemistry I 3
    - or **CH 125** General Chemistry I HONORS
  - **CH 116** General Chemistry I Laboratory 1
    - or **CH 126** General Chemistry I HONORS Laboratory
  - **CH 117** General Chemistry II 3
    - or **CH 127** General Chemistry II HONORS
  - **CH 118** General Chemistry II Laboratory 1
    - or **CH 128** General Chemistry II HONORS Laboratory
  - **CH 235** Organic Chemistry I 3
    - or **CH 245** Organic Chemistry I Honors
  - **CH 236** Organic Chemistry I Laboratory 1
    - or **CH 246** Organic Chemistry I Laboratory (Honors)
  - **CH 237** Organic Chemistry II 3
    - or **CH 247** Organic Chemistry II Honors
  - **CH 238** Organic Chemistry II Laboratory 1
    - or **CH 248** Organic Chemistry II Laboratory (Honors)

- Have arranged with a faculty mentor to do a research project in chemistry; and
- Have submitted the honors program application form and a one-page honors research proposal to the Chemistry Honors Director.

**Benefits**

In addition to the benefits associated with a mentoring program that fosters a spirit of inquiry, independence, and initiative and integrates the student’s prior course work into a working knowledge of chemistry in the laboratory, the student who completes the program will graduate “With Honors in Chemistry.”

**Contact**

For more information and/or admission to the Chemistry Honors Program, contact

Director of the Department of Chemistry Honors Program
Chemistry Building
Birmingham, AL 35294-1240
CH 107R. Introductory Chemistry II Recitation. 0 Hours.
Introductory Chemistry II recitation is used to build problem-solving skills in a study-group environment. Included in these sections are homework, quizzes, lecture related problems, and exams. Concurrent enrollment in CH 107 Introductory Chemistry II required.

CH 108. Introductory Chemistry II Laboratory. 1 Hour.
Emphasizes development of lab skills and demonstration of phenomena covered in CH 107. Not applicable to a major or minor in chemistry. Writing assignments structured to build on scientific reasoning. Quantitative Literacy is a significant component of this course. Concurrent enrollment in or prior completion of CH 107 strongly recommended.

CH 115. General Chemistry I. 3 Hours.
Stoichiometry, quantum theory, atomic structure, chemical bonding, acids-bases, colligative properties and periodicity. Laboratory emphasizes quantitative analysis. Writing assignments structured to build on scientific reasoning. Concurrent enrollment in CH 115R General Chemistry I Recitation required. Quantitative Literacy is a significant component of this course. This course, when taken with its corresponding laboratory, meets the Core Curriculum requirements for Area III: Natural Sciences.

Prerequisites: MA 102 [Min Grade: B] or (MA 105 [Min Grade: C] or MA 105 [Min Grade: P]) or MA 106 [Min Grade: C] (Can be taken Concurrently) or MA 107 [Min Grade: C] (Can be taken Concurrently) or MA 109 [Min Grade: C] (Can be taken Concurrently) or MA 125 [Min Grade: C] (Can be taken Concurrently) or MA 225 [Min Grade: C] (Can be taken Concurrently) or MA 125 [Min Grade: P] or MAC1 17 or MAAD 21 or MTH2 75 or MTH3 75 or MTH4 75 or MTH5 75 or (A02 23 and HSCG 3.5) or (A02 24 and HSCG 3.0) or (A02 25 and HSCG 2.5) or A02 26 or (S02 540 and HSCG 3.50) or (S02 560 and HSCG 3.00) or (S02 580 and HSCG 2.50) or (SAT2 580 and HSCG 3.50) or (SAT2 600 and HSCG 3.00) or (SAT2 620 and HSCG 2.50) or SAT2 640 or S02 600 or MPL 61

CH 115R. General Chemistry I Recitation. 0 Hours.
General Chemistry I recitation is used to build problem-solving skills in a study-group environment. Included in these sections are homework, quizzes, lecture related problems, and exams. Concurrent enrollment in CH 115 General Chemistry I required.

CH 116. General Chemistry I Laboratory. 1 Hour.
Emphasizes development of laboratory skills and quantitative analyses related to CH 115. Writing assignments structured to build on scientific reasoning. Concurrent enrollment or prior completion of CH 115 General Chemistry I recommended. Quantitative Literacy is a significant component of this course.

CH 117. General Chemistry II. 3 Hours.
Solutions, chemical kinetics, chemical thermodynamics, chemical equilibrium and special topics (organic, biochemistry, descriptive chemistry) Writing assignments structured to build on scientific reasoning. Concurrent enrollment in CH 117R General Chemistry II Recitation required. Quantitative Literacy is a significant component of this course. This course, when taken with its corresponding laboratory, meets the Core Curriculum requirements for Area III: Natural Sciences.

Prerequisites: CH 115 [Min Grade: C] or CH 125 [Min Grade: C]

CH 117R. General Chemistry II Recitation. 0 Hours.
General Chemistry II Recitation is used to build problem-solving skills in a study-group environment. Included in these sections are homework, quizzes, lecture related problems, and exams. Concurrent enrollment in CH 117 General Chemistry II required.

CH 118. General Chemistry II Laboratory. 1 Hour.
Emphasizes development of laboratory skills and quantitative analyses related to CH 117. Writing assignments structured to build on scientific reasoning. Concurrent enrollment or prior completion of CH 117 General Chemistry II recommended. Quantitative Literacy is a significant component of this course.

CH 125. General Chemistry I HONORS. 3 Hours.
Stoichiometry, quantum theory, atomic structure, chemical bonding, acids-bases, colligative properties and periodicity using an atoms-first approach. Writing assignments structured to build on scientific reasoning. Students should already have completed a college-level general chemistry course such as AP chemistry or a similar equivalent before taking CH 125. The honors course provides less time covering basic concepts so as to allow time to cover concepts not discussed in the CH 115 course, such as solid state structures and molecular orbital theory. The class size is limited to 60 students. Concurrent enrollment in CH 125R General Chemistry I Recitation required. Quantitative Literacy is a significant component of this course. This course, when taken with its corresponding laboratory, meets the Core Curriculum requirements for Area III: Natural Sciences.

Prerequisites: MA 102 [Min Grade: B] or MA 105 [Min Grade: C] or MA 105 [Min Grade: P] or MA 106 [Min Grade: C] (Can be taken Concurrently) or MA 107 [Min Grade: C] (Can be taken Concurrently) or MA 109 [Min Grade: C] (Can be taken Concurrently) or MA 125 [Min Grade: C] (Can be taken Concurrently) or MA 225 [Min Grade: C] (Can be taken Concurrently) or MA 125 [Min Grade: P] or MAC1 17 or MAAD 21 or MTH2 75 or MTH3 75 or MTH4 75 or MTH5 75 or (A02 23 and HSCG 3.5) or (A02 24 and HSCG 3.0) or (A02 25 and HSCG 2.5) or A02 26 or (S02 540 and HSCG 3.50) or (S02 560 and HSCG 3.00) or (S02 580 and HSCG 2.50) or (SAT2 580 and HSCG 3.50) or (SAT2 600 and HSCG 3.00) or (SAT2 620 and HSCG 2.50) or SAT2 640 or S02 600 or MPL 61

CH 125R. General Chemistry I HONORS Recitation. 0 Hours.
General Chemistry I recitation is used to build problem-solving skills in a study-group environment. Included in these sections are homework, quizzes, lecture related problems, and exams. Concurrent enrollment in CH 125 General Chemistry I required.

CH 126. General Chemistry I HONORS Laboratory. 1 Hour.
Emphasizes development of laboratory skills and quantitative analyses related to CH 125. Writing assignments structured to build on scientific reasoning. (Core Area III) Quantitative Literacy is a significant Component of this course. Permission of instructor or enrollment in Honors College or Chemistry Scholars program required. Concurrent enrollment or prior completion of CH 125 strongly recommended.

CH 127. General Chemistry II HONORS. 3 Hours.
Solutions, chemical kinetics, chemical thermodynamics, chemical equilibrium and special topics (organic, biochemistry, descriptive chemistry) Writing assignments structured to build on scientific reasoning. The honors course provides less time covering basic concepts so as to allow time to cover concepts not discussed in the CH 117 course, such as nuclear chemistry. The class size is limited to 60 students. Concurrent enrollment in CH 127R General Chemistry II Recitation required. Quantitative Literacy is a significant component of this course. This course, when taken with its corresponding laboratory, meets the Core Curriculum requirements for Area III: Natural Sciences.

Prerequisites: CH 115 [Min Grade: A] or CH 125 [Min Grade: B]

CH 127R. General Chemistry II HONORS Recitation. 0 Hours.
General Chemistry II Recitation is used to build problem-solving skills in a study-group environment. Included in these sections are homework, quizzes, lecture related problems, and exams. Concurrent enrollment in CH 127 General Chemistry II required.
CH 128. General Chemistry II HONORS Laboratory. 1 Hour.
Emphasizes development of laboratory skills and quantitative analyses related to CH 127. Writing assignments structured to build on scientific reasoning. (Core Area III) Quantitative Literacy is a significant component of this course. Permission of instructor or enrollment in Honors College or Chemistry Scholars program required. Concurrent enrollment or prior completion of CH 127 strongly recommended.
Prerequisites: CH 115 [Min Grade: A] or CH 125 [Min Grade: B] and CH 116 [Min Grade: A] or CH 126 [Min Grade: B]

CH 199. Bridge Between General and Organic Chemistry. 1 Hour.
This is a one credit hour, pass-fail, 6-week, on-line class designed to prepare general chemistry students for success in the organic chemistry sequence. The course will reinforce topics from general chemistry and introduce basic concepts that will be encountered in organic chemistry. Recommended for transfer students or for students who earned a grade of C in General Chemistry II.
Prerequisites: CH 117 [Min Grade: C] or CH 127 [Min Grade: C]

CH 201. Research Methods in Chemistry. 3 Hours.
Comprehensive approach for developing research skills used in chemistry and biochemistry research laboratories. Permission of instructor required.
Prerequisites: CH 115 [Min Grade: C](Can be taken Concurrently) or CH 125 [Min Grade: C](Can be taken Concurrently)

CH 235. Organic Chemistry I. 3 Hours.
Prerequisites: CH 117 [Min Grade: C] or CH 127 [Min Grade: C]

CH 235R. Organic Chemistry I Recitation. 0 Hours.
Organic Chemistry I recitation is used to build problem-solving skills in study-group environments. Concurrent enrollment in CH 235R Organic I HONORS recitation required.
Prerequisites: CH 117 [Min Grade: C] or CH 127 [Min Grade: C]

CH 236. Organic Chemistry I Laboratory. 1 Hour.
Techniques of organic chemistry. Synthesis, purification, and characterization of organic compounds. Concurrent enrollment or prior completion of CH 235 strongly recommended.
Prerequisites: (CH 117 [Min Grade: C] or CH 127 [Min Grade: C]) and (CH 118 [Min Grade: C] or CH 119 [Min Grade: C] or CH 128 [Min Grade: C])

CH 237. Organic Chemistry II. 3 Hours.
Reactions of aromatic compounds and carbonyl containing functional groups: aldehydes, ketones, acids, esters and amides. Molecules of biological interest, such as proteins and carbohydrates. This Honors course moves at a slightly faster pace than CH 237 and is taught in a slightly nontraditional way with a greater focus on organic synthesis. There is less lecture, more class discussion, and more problem-solving. Concurrent enrollment in CH 247R Organic II Honors Recitation required.
Prerequisites: CH 235 [Min Grade: C] or CH 245 [Min Grade: C]

CH 237R. Organic Chemistry II Recitation. 0 Hours.
Organic Chemistry II recitation is used to build problem-solving skills in study-group environments. Concurrent enrollment in CH 237R Organic II Honors Recitation required.
Prerequisites: CH 235 [Min Grade: A] or CH 245 [Min Grade: C]

CH 245. Organic Chemistry I Honors. 3 Hours.
Structure, nomenclature, properties, and reactivity of compounds with various organic functional groups: alkanes, alkenes, alkynes, alkyl halides and alcohols. Emphasis on the mechanisms of organic reactions and problem solving. This honors course moves at a slightly faster pace than CH 235, and is taught in a slightly nontraditional way. There is less lecture, more class discussion, and more problem-solving. Concurrent enrollment in CH 245R Organic I HONORS Recitation required. Open to Honors College students, Chemistry Scholars, or Permission of Instructor.
Prerequisites: CH 117 [Min Grade: C] or CH 127 [Min Grade: C]

CH 245R. Organic Chemistry I Honors Recitation. 0 Hours.
Organic Chemistry I recitation is used to build problem-solving skills in study-group environments. Concurrent enrollment in CH 245R Organic Chemistry I HONORS required.

CH 246. Organic Chemistry I Laboratory (Honors). 1 Hour.
Emphasis placed on development of techniques used in organic research laboratories and scientific writing. Permission of instructor or enrollment in Honors College or Chemistry Scholars program required.
Prerequisites: CH 245 [Min Grade: C](Can be taken Concurrently)

CH 247. Organic Chemistry II Honors. 3 Hours.
Reactions of aromatic compounds and carbonyl containing functional groups: aldehydes, ketones, acids, esters and amides. Molecules of biological interest, such as proteins and carbohydrates. This Honors course moves at a slightly faster pace than CH 237, and is taught in a slightly nontraditional way with a greater focus on organic synthesis. There is less lecture, more class discussion, and more problem-solving. Concurrent enrollment in CH 247R Organic II Honors Recitation required.
Prerequisites: CH 235 [Min Grade: A] or CH 245 [Min Grade: C]

CH 247R. Organic Chemistry II Honors Recitation. 0 Hours.
Organic Chemistry II recitation is used to build problem-solving skills in study-group environments. Concurrent enrollment in CH 247R Organic II Honors Recitation required.

CH 248. Organic Chemistry II Laboratory (Honors). 1 Hour.
Synthesis, purification, and characterization of organic compounds using instrumental analysis, molecular modeling, scientific writing, and oral presentation. Permission of instructor, or enrollment in Honors College or Chemistry Scholars program required.
Prerequisites: CH 247 [Min Grade: C](Can be taken Concurrently)

CH 325. Physical Chemistry I with Calculus: Thermodynamics and Chemical Kinetics. 3 Hours.
Thermodynamics, chemical equilibria, and chemical kinetics. Lecture and laboratory. Prior completion of PH 221 and CH 355 strongly recommended. Prior completion of, or concurrent enrollment in, MA 227 strongly recommended. Concurrent enrollment in, or prior completion of, CH 325L Physical Chemistry I Lab required.
Prerequisites: (CH 117 [Min Grade: C] or CH 117 [Min Grade: P]) or CH 127 [Min Grade: C] and (MA 126 [Min Grade: C] or MA 226 [Min Grade: C]) or (MA 126 [Min Grade: C] or MA 226 [Min Grade: C]) and (PH 201 [Min Grade: P]) or PH 221 [Min Grade: C] or PH 221 [Min Grade: P])
CH 333. Synthetic and Physical Laboratory Methods. 2 Hours.
Fundamental concepts including chemical equilibrium, kinetics, and
electronic interactions are explored through synthetic design, advanced
spectroscopic methods, and data analysis. Techniques from organic
chemistry are further developed and scientific writing is emphasized.
Prerequisites: (CH 237 [Min Grade: C] or CH 247 [Min Grade: C]) and
(CH 238 [Min Grade: C] or CH 239 [Min Grade: C]) and CH 355 [Min
Grade: C] (Can be taken Concurrently) and CH 355L [Min Grade: C] (Can
be taken Concurrently)

CH 345. Inorganic Chemistry: Principles and Applications of
Chemical Periodicity. 3 Hours.
Systematic coverage of descriptive chemistry. Chemical reactivity
using structural and electronic parameters. Development of chemical
understanding and intuition of elements and their compounds, as well as
industrial and environmental applications.
Prerequisites: (CH 237 [Min Grade: C] or CH 247 [Min Grade: C]) and
(CH 238 [Min Grade: C] or CH 239 [Min Grade: C])

CH 355. Quantitative Analysis. 3 Hours.
Principles of analytical measurements, statistical and volumetric
techniques, spectrophotometric analysis, and chromatography, with
emphasis on equilibrium and applications. Concurrent enrollment, or prior
completion of, CH 355L Quantitative Analysis Lab required.
Prerequisites: CH 117 [Min Grade: C] or CH 127 [Min Grade: C]

CH 355L. Quantitative Analysis Laboratory. 1 Hour.
Quantitative analysis laboratory. Concurrent enrollment or prior
completion of CH 355 Quantitative Analysis required.
Prerequisites: CH 355 [Min Grade: C] (Can be taken Concurrently)

CH 391. Cooperative Education in Chemistry. 2-3 Hours.
Analysis of the concepts and models of chemistry with emphasis on
computational skills for chemistry and science teachers. Appropriate for
students seeking certification as chemistry or science teachers. Junior
or senior standing and minimum GPA of 2.5 or above required. Requires
permission of and evaluation by appropriate faculty advisor.

CH 416. Chemical Demonstrations I. 3 Hours.
Demonstration and analysis of safe, practical and effective experiments
suitable for middle/high school students. At least 50 demonstrations will
be performed. Not applicable to a major or minor in chemistry. Requires
permission of instructor.

CH 417. Chemical Demonstrations II. 3 Hours.
Demonstration and analysis of safe, practical and effective experiments
suitable for middle/high school students. At least 50 demonstrations will
be performed. Not applicable to a major or minor in chemistry. Requires
permission of instructor.

CH 426. Physical Chemistry II: Structure/Bonding and Molecular
Spectroscopy. 3 Hours.
Quantum mechanics, chemical bonding, and molecular spectroscopy.
Prior completion of CH 325 and MA 227 strongly recommended.
Prerequisites: (CH 117 [Min Grade: C] or CH 127 [Min Grade: C] or
CH 117 [Min Grade: P]) and (MA 126 [Min Grade: C] or MA 126 [Min
Grade: P] or MA 226 [Min Grade: C]) and (PH 202 [Min Grade: C] or
PH 222 [Min Grade: C] or PH 222 [Min Grade: P])

CH 429. Special Topics in Physical Chemistry. 1-3 Hour.
Special Topics in selected areas of physical chemistry under the
supervision of faculty sponsor. Requires permission of instructor.

CH 430. Physical Organic Chemistry. 3 Hours.
The course will focus on basic concepts, molecular orbital theory,
and organic reaction mechanisms, built on the foundation of
organic chemistry I and II. The goal is to provide students a deeper
understanding of the general principles, especially structure, mechanism,
and their relationships.
Prerequisites: (CH 237 [Min Grade: C] or CH 247 [Min Grade: C])

CH 439. Special Topics in Organic Chemistry. 1-3 Hour.
Special Topics in selected areas of organic chemistry under the
supervision of faculty sponsor. Requires permission of instructor.

CH 440. Transition Metal Chemistry. 3 Hours.
Relationship between bonding, structure, and properties of compounds
including reactions, mechanisms, and catalysis of organometallic and
bioinorganic chemistry. Concurrent enrollment in, or prior completion of,
CH 427 Molecular Structure and Spectroscopy Laboratory required.
Prerequisites: CH 346 [Min Grade: C]

CH 444. Spectroscopic and Separations Laboratory Methods. 2
Hours.
Fundamental concepts including electronic and vibrational transitions,
nuclear magnetic resonance, and molecular orbital theory are explored
through the use of commonly-accessible laboratory instruments.
Chromatographic theory and quantitative analysis are applied to the
identification and quantitation of analytical standards and unknowns
using industry-standard instrumentation. The second half of the course
reinforces quantitative methods with hands-on practical training.
Prerequisites: (CH 237 [Min Grade: C] or CH 247 [Min Grade: C]) and
(CH 238 [Min Grade: C] or CH 239 [Min Grade: C]) and CH 355 [Min
Grade: C]

CH 449. Special Topics in Inorganic Chemistry. 1-3 Hour.
Special Topics in selected areas of inorganic chemistry under the
supervision of faculty sponsor. Requires permission of instructor.

CH 450. Instrumental Analysis. 3 Hours.
Focus on modern analytical chemistry instrumentation including chemical
separations, spectroscopies (atomic absorption, infrared, UV-visible,
fluorescence), mass spectroscopy, and thermal analysis.
Prerequisites: (CH 117 [Min Grade: C] or CH 127 [Min Grade: C])

CH 451. Chemometrics. 3 Hours.
Introduction to basic data analysis techniques that include testing
hypotheses, establishing tendencies and correlations, experimental
design, etc. The course is designed to provide a support to a research
chemist in effectively solving everyday problems associated with
production and interpretation of experimental data.

CH 459. Special Topics in Analytical Chemistry. 1-3 Hour.
Special Topics in selected areas of analytical chemistry under the
supervision of faculty sponsor. Requires permission of instructor.
Prerequisites: (CH 235 [Min Grade: C] and CH 236 [Min Grade: C]) and
(CH 237 [Min Grade: C] and CH 238 [Min Grade: C]) and CH 355 [Min
Grade: C]

CH 460. Fundamentals of Biochemistry. 3 Hours.
Overview of biochemical principles; chemistry of aqueous solutions,
biochemical building blocks including amino acids, carbohydrates, lipids,
and nucleotides; examination of metabolic pathways and enzymes that
mediate catabolic and anabolic metabolism of carbohydrates, lipids,
amino acids, and nucleic acids. Application of clinical correlations of
metabolism to human nutrition and disease. This course is designed for
Chemistry majors as well as students interested in medicine, dentistry,
ophtalmology, or pharmacy.
Prerequisites: CH 237 [Min Grade: C] or CH 247 [Min Grade: C]
CH 461. Advanced Biochemistry. 3 Hours.
Protein structure and function, enzymology, DNA structure, prokaryotic replication, transcription, and protein synthesis. Membrane structure and function, carbohydrate structure and function. Methods for isolating and characterizing macromolecule structure and function including chromatography, gel electrophoresis, CD, UV, and fluorescence spectroscopy, mass spectroscopy, X-ray crystallography and nuclear magnetic resonance spectroscopy.
Prerequisites: CH 460 [Min Grade: C]

CH 463. Biochemistry Laboratory. 3 Hours.
Introduction to modern biochemical techniques used for the expression, isolation, and characterization of proteins and other biological macromolecules. Space is limited. Students with a Chemistry Major with either the Biochemistry or Forensic Tracks have priority.
Prerequisites: CH 355 [Min Grade: C] and CH 460 [Min Grade: C]

CH 464. Physical Biochemistry Laboratory. 3 Hours.
Physical/analytical approaches (including mass spectroscopy and NMR) toward determination of macromolecular structures, ligand binding, and enzymology. Space is limited. Students with the Chemistry Major with the Biochemistry Track have priority. Concurrent or prior enrollment in CH 461 is recommended.
Prerequisites: CH 450 [Min Grade: C] or CH 460 [Min Grade: C] or CH 461 [Min Grade: C]

CH 469. Special Topics in Biochemistry. 1-3 Hour.
Special topics in selected areas of biochemistry, biophysical chemistry, or structural biochemistry under supervision of faculty sponsor. Requires permission of instructor.
Prerequisites: CH 462 [Min Grade: C]

CH 471. Medicinal Chemistry and Drug Discovery. 3 Hours.
Emphasis on structure-based design strategies for small organic molecule drugs using common macromolecular drug targets. Examples of successful design for experimental and clinically used drugs will be presented.
Prerequisites: CH 237 [Min Grade: C] and CH 460 [Min Grade: C]

CH 472. Chemistry of Natural Products. 3 Hours.
The principal focus of this course will be the introduction of synthesis and medicinal chemistry of natural products. Drug discovery using natural products, with specific examples in the areas of antibacterial, anticancer, and analgesic drugs will be introduced. An overview of structural classes, biosynthetic pathways and application of asymmetric synthesis in the synthesis of specific examples from each class will be discussed. This course is intended for undergraduate students at the senior level. Prior completion of prerequisite courses with a grade of B or better strongly recommended.
Prerequisites: CH 235 [Min Grade: C] or CH 245 [Min Grade: C] and CH 236 [Min Grade: C] and (CH 237 [Min Grade: C] or CH 247 [Min Grade: C]) and CH 238 [Min Grade: C]

CH 477. Radiochemistry for the Life Sciences. 3 Hours.
This course is intended to act as an introduction to radiochemistry. It will cover production, instrumentation, and radiochemistry techniques to make use of radiotracers in the life sciences from basic biological and environmental applications to medical imaging and therapy.

CH 480. Polymer Chemistry I. Basic Principles. 3 Hours.
Basic chemical principles of polymers with the focus on synthesis, characterization, and applications of synthetic and biological macromolecules. Prior completion of CH 237, CH 325, and CH 355 and (MSE 350) for MSE students recommended. Concurrent enrollment in, or prior completion of, CH 480L Polymer Chemistry I Lab is required.
Prerequisites: (CH 117 [Min Grade: C] or CH 127 [Min Grade: C]) and CH 460 [Min Grade: C] and CH 355 [Min Grade: C] and CH 247 [Min Grade: C] and CH 481 [Min Grade: C]

CH 481. Polymer Chemistry II. Fundamental Properties. 3 Hours.
Fundamentals of chemical, physical and molecular properties of polymers in bulk and solution. Concurrent enrollment in CH 481L Polymer Chemistry II Laboratory required. Prior completion of CH 237, CH 325, and CH 355 (and MSE 350) for MSE students recommended. Concurrent enrollment in, or prior completion of, CH 481L Polymer Chemistry II Laboratory is required.
Prerequisites: (CH 117 [Min Grade: C] or CH 127 [Min Grade: C]) and CH 460 [Min Grade: C] and CH 355 [Min Grade: C] and CH 247 [Min Grade: C]

CH 481L. Polymer Chemistry II Laboratory. 1 Hour.
Polymer Chemistry I Laboratory. Concurrent enrollment in CH 480 Polymer Chemistry I required.

CH 489. Special Topics in Polymer Chemistry. 1-3 Hour.
Special topics in selected areas of polymer chemistry under supervision of faculty sponsor. Requires permission of instructor.

CH 492. Research Methods. 1-3 Hour.
This course is required in the UABTEACH program and is specially designed to meet the needs of future teachers. Students meet two hours per week for non-traditional, interactive lectures and two hours per week for lab. The course is cross-listed (Physics, Chemistry, and Biology). It provides students with the tools that scientists use to solve scientific problems; gives students the opportunity to use these tools in a laboratory setting; makes students aware of how scientists communicate with each other through peer-reviewed scientific literature; and enables students to understand how scientists develop new knowledge and insights. The course requires a substantial amount of writing.

CH 493. Chemistry in Culture & Ethics. 3 Hours.
Designed to explore the impact of chemical innovations on society; challenges students to consider ethical use of chemical innovations and broader impacts of chemistry in society. Writing assignments are structured to build on scientific reasoning. Capstone course intended for graduating senior Chemistry majors.
Prerequisites: CH 237 [Min Grade: C] or CH 247 [Min Grade: C] and CH 325 [Min Grade: C]

CH 495. Ethics in Chemical Research. 1 Hour.
Designed to explore the impact of chemical innovations on society; challenges students to consider ethical use of chemical innovations and broader impacts of chemistry in society. Writing assignments are structured to build on scientific reasoning. Capstone course intended for graduating senior Chemistry majors.
Prerequisites: CH 237 [Min Grade: C] or CH 247 [Min Grade: C] and CH 497 [Min Grade: C]

CH 497. Undergraduate Research. 2-3 Hours.
Research project conducted under the supervision of a faculty mentor. Two semesters are highly recommended for minimum accumulation of 6 semester hours. A progress report is required each semester and a comprehensive written report in ACS format is required at the completion of the project. Permission of faculty mentor and instructor required; GPA 2.5 or greater overall; GPA 3.0 or greater in required chemistry courses.
CH 498. Chemistry Teaching Methods. 3 Hours.
This course provides chemistry majors who will be future chemistry
teachers with insights into the fundamental principles of chemistry in a
way that can be transported to the classroom. The course will cover all
aspects of teaching, measurements of effectiveness, and outcomes.
Permission of instructor required.
Prerequisites: CH 235 [Min Grade: C]

CH 499. Honors Research and Thesis. 0-3 Hours.
Research project conducted under the supervision of faculty mentor.
Prior completion of 6 hours of CH 497. Admission to the Chemistry
Honors Program is required; a research proposal must be on file with and
approved by Chemistry Honors Director. The course concludes with a
written honors thesis and oral presentation and defense. Chemistry GPA
3.25 or greater; overall GPA 3.0 or greater required.
Prerequisites: CH 497 [Min Grade: C]