# Planning Sheet: BACHELOR OF SCIENCE in CHEMISTRY

(Effective Fall 2012. This major consists of 18 courses)

## Chemistry Requirements:

<table>
<thead>
<tr>
<th>Term</th>
<th>Grade</th>
<th>Course #</th>
<th>AugCore</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>___</td>
<td>___</td>
<td>CHM 115</td>
<td>NSM-L</td>
<td>General Chemistry 1 (Prereq: MPG 3; high school chemistry recommended)</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>CHM 116</td>
<td>NSM-L</td>
<td>General Chemistry 2 (Prereq: CHM 115)</td>
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<td>___</td>
<td>___</td>
<td>CHM 351</td>
<td></td>
<td>Organic Chemistry I (Prereq: CHM 116)</td>
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<tr>
<td>___</td>
<td>___</td>
<td>CHM 352</td>
<td></td>
<td>Organic Chemistry II (Prereq: CHM 351)</td>
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<tr>
<td>___</td>
<td>___</td>
<td>CHM 353</td>
<td></td>
<td>Quantitative Analytical Chemistry (Prereq: CHM 116 &amp; MPG 3)</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>CHM 361</td>
<td></td>
<td>Physical Chemistry 1 (Prereq: Passed CT assessment or GST 100, CHM 106 or 116, PHY 121 &amp; 122, and MAT 145 &amp; 146)</td>
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<tr>
<td>___</td>
<td>___</td>
<td>CHM 363</td>
<td></td>
<td>Physical Chemistry Lab 1 (.5) (Prereq: ENL 111 or 112 or HON 111 &amp; CHM 361 or concurrent registration)</td>
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<tr>
<td>___</td>
<td>___</td>
<td>CHM 364</td>
<td></td>
<td>Physical Chemistry 2 (Prereq: CHM 361)</td>
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<tr>
<td>___</td>
<td>___</td>
<td>CHM 365</td>
<td></td>
<td>Physical Chem. Lab 2 (.5) (Prereq: CHM 364 or concurrent registration)</td>
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<tr>
<td>___</td>
<td>___</td>
<td>CHM 464</td>
<td></td>
<td>Advanced Organic Chemistry (Prereq: CHM 352, 353, &amp; 361 or consent)</td>
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<tr>
<td>___</td>
<td>___</td>
<td>CHM 481</td>
<td></td>
<td>Advanced Analytical Chemistry (Prereq: CHM 353 &amp; 361 or consent)</td>
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<tr>
<td>___</td>
<td>___</td>
<td>CHM 482</td>
<td></td>
<td>Advanced Inorganic Chemistry (Prereq: CHM 352 &amp; 361 or consent)</td>
</tr>
<tr>
<td>___</td>
<td>___</td>
<td>CHM 491</td>
<td></td>
<td>Chemistry Seminar (Non-credit. 4 semesters)</td>
</tr>
</tbody>
</table>

**Biochemistry Requirement:** Complete 1 Biochemistry course, BIO 369 or other approved ACTC/transfer course. Consult with your faculty advisor.

| ___  | ___   | BIO 369  |         | ☐ Biochemistry (prereq: BIO 253 & CHM 351) |
|      |       |          |         | ☐ Other Approved Biochemistry course: __________________________ |

**Chemistry Electives:** Select and complete 1 of the following courses.

- ___ ___ CHM 367  | ☐ Properties of Polymers (Prereq: CHM 352 & 361) |
- ___ ___ CHM 470  | ☐ Principles of Medicinal Chemistry (Prereq: CHM 352 or consent & BIO 369 recommended) |
- ___ ___ CHM 495  | ☐ Topics in Advanced Chemistry |

**Non-departmental Supporting Requirements:**

- ___ ___ PHY 121  | NSM-L  | General Physics 1 (Prereq: MAT 145 or concurrent registration) |
- ___ ___ PHY 122  | NSM-L  | General Physics 2 (Prereq: PHY 121, & MAT 146 or concurrent registration, and ENL 111 or 112 or HON 111) |
- ___ ___ MAT 145  | NSM    | Calculus 1 (Prereq: MPG 4) |
- ___ ___ MAT 146  | NSM    | Calculus 2 (Prereq: MAT 145) |
- ___ ___ MAT 245  |        | Calculus 3 (Prereq: MAT 146) |

**Notes:**

- **Keystone:** SCI 490: Integrated Science (.5 credit) is recommended to meet the Keystone requirement.
- **B.S. Waiver:** Student completing the B.S. in Chemistry may waive two Liberal Arts Foundation courses (in two different areas), or waive the two-course Modern Language requirement.
- **Abbreviation Key:** ML = Modern Language; SC = Signature Curriculum; EM = Engaging Minneapolis; AE = Augsburg Experience; KC = Senior Keystone Course; NSM = Natural Science & Mathematics - no lab; NSM-L = Natural Science & Mathematics-with lab; SBS = Social & Behavioral Science; FA = Fine Arts; HUM = Humanities

See back for information on graduation skills requirements
Graduation skills, including the Quantitative Reasoning requirements, are completed as follows. Graduation skills in Critical Thinking, Writing, Speaking, and Quantitative Reasoning are required for graduation. Critical Thinking is embedded in all majors. Plans for completion of other graduation skills are determined by the major department. Consult your department chair or faculty advisor to select appropriate courses to meet the Quantitative Reasoning (QR) graduation skill. QR is satisfied by completing one (1) Quantitative Foundational course (QF) and one (1) Quantitative Application course (QA), or one (1) combined QFA course. The most current information on Graduation Skills can be found in the Augsburg College catalog at www.augsburg.edu/catalog/.

Transfer students must consult an advisor about potential adjustments to their course requirements to fulfill each graduation skill.

<table>
<thead>
<tr>
<th>Designated Major Course</th>
<th>GRADUATION SKILLS – Chemistry B.S.</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embedded in major</td>
<td>Writing Requirements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TWO (2) Writing courses</td>
<td></td>
</tr>
<tr>
<td>COM 111 or 115</td>
<td>Speaking</td>
<td></td>
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<tr>
<td></td>
<td>One (1) Speaking course</td>
<td></td>
</tr>
<tr>
<td>Designated Major Course</td>
<td>QUANTITATIVE REASONING</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Completed</td>
<td></td>
</tr>
<tr>
<td>Embedded in major</td>
<td>Quantitative Foundations &amp; Applications</td>
<td>QFA course</td>
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<tr>
<td></td>
<td>One (1) QFA course (Prereq: MPG3)</td>
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<tr>
<td></td>
<td>– OR –</td>
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<tr>
<td>Embedded in major</td>
<td>Quantitative Foundations and Quantitative Applications</td>
<td>QA course</td>
</tr>
<tr>
<td></td>
<td>One (1) QF course (Prereq: MPG 3) and one (1) QA course</td>
<td></td>
</tr>
</tbody>
</table>

**Graduation Tally Checklist**

These requirements were implemented in April 2003 and remain in effect until further notice.

### Cumulative Course Credits
- Minimum number of course credits needed for graduation = 32
- At least 8 credits completed at Augsburg.
- 6 of last 8 credits completed in residence.
- Second degree – minimum of 8 credits completed in residence.

### Grade Point Average (GPA)
- Minimum 2.0 GPA required in major, minor, & overall.
- Some majors require higher GPA.
- Latin Honors GPA requirements:
  - Summa cum laude: 3.9-4.0
  - Magna cum laude: 3.80-3.89
  - Cum laude: 3.60-3.79

### Other Limits
- Overall maximum courses graded Pass/No Pass (P/N)
- Grade of 2.0 or above required to Pass and earn credit for course.
- Maximum of 2 of 6 credits P/N may be in major.
- Major Courses graded Pass/No Pass (P/N)
- Maximum of 2
- Latin Honors courses graded Pass/No Pass (P/N)
- Maximum of 2
- Latin Honors traditionally graded courses
- Minimum of 14
- Internships
- Maximum of 4
- Independent/Directed Studies
- Maximum of 2

### Progress Towards Completion

- Transfer Credits Earned
- + Aug. Credits Earned
- = Total Credits Earned
- # Credits Needed

- Cumulative GPA
- Major 1 GPA
- Major 2 GPA
- Minor GPA
Sample Four-Year Plan (B.S.)
This is a possible plan for the Bachelor of Science in Chemistry, though there are many configurations of courses. Students should complete CHM 115 – 116 and MAT 145 – 146 during the first year. Liberal Arts Foundation (LAF), Modern Language and other Core courses are more flexible. **NOTE: Students completing the B.S. curriculum may waive two Liberal Arts Foundation courses (in two different areas), or waive the two-course Modern Language requirement.**

**Freshman Year**
- **Fall Term (4)**
  - CHM 115
  - MAT 145
  - LAF Course
  - ENL 111
  - AugSem
- **Spring (4)**
  - CHM 116
  - MAT 146
  - LAF Course
  - REL 100
  - HPE 001

**Sophomore Year**
- **Fall Term (4)**
  - CHM 351
  - PHY 121
  - MAT 245
  - Modern Language
- **Spring (4)**
  - CHM 352
  - PHY 122
  - REL 200
  - Modern Language

**Junior Year**
- **Fall Term (4.5)**
  - CHM 361
  - CHM 363 (.5 credit)
  - CHM 353
  - CHM 491 (non-credit)
  - BIO 369 or ACTC Biochemistry
  - COM 115 or COM 111
- **Spring (4.5)**
  - CHM 364
  - CHM 365 (.5 credit)
  - CHM 481
  - CHM 491 (non-credit)
  - LAF Course
  - Minor or Elective

**Senior Year**
- **Fall Term (4)**
  - CHM 482
  - CHM 464
  - CHM 491 (non-credit)
  - Minor or Elective
  - Minor or Elective
- **Spring (3.5)**
  - CHM 367 or CHM 470
  - CHM 491 (non-credit)
  - Keystone: SCI 490 (.5 credit)
  - Minor or Elective
  - Minor or Elective
  - HPE Skill

**Notes:**
- CHM 464 and CHM 482 are offered in the fall; CHM 364 and CHM 481 are in spring.
- CHM 367 and CHM 470 are offered alternating springs.
- Students planning to apply to medical school will want to take certain biology requirements, including BIO 151, 152, 253, and 369. Also recommended for the MCAT are BIO 355, 473, and 476.
- COM 115 or COM 111 fulfills both the speaking skill and a Humanities Liberal Arts Foundation requirement.

**What can I do with a Chemistry major?**
The following jobs are some of the positions that chemistry majors could pursue. Many require professional or graduate school.

For more information on possible careers in chemistry, please talk with your faculty advisor, and also the Center for Service, Work and Learning.

- Biochemist
- Chemist
- Chemical Engineer
- Consultant
- Dietician
- Environmental Health Specialist
- Environmental Lawyer
- Food Scientist
- Forensic Technician
- Forensic Scientist
- Geneticist
- Laboratory Technician
- Patent Attorney
- Pharmaceutical Development
- Pharmaceutical Sales
- Pharmacist
- Pharmacologist
- Physician
- Plant Manager
- Professor
- Public Health
- Quality Control Scientist
- Research Scientist
- Teacher
- Technical Writer
- Toxicologist
- Veterinarian

**Chemistry Department**
The Chemistry Department is located in Science Hall 137. You may contact the following faculty for more information on the major requirements, and also check out the website at: www.augsburg.edu/chemistry.

Joan C Kunz, Ph.D.
Associate Professor, Dept Chair
Phone: 612-330-1078
Email: kunz@augsburg.edu

Ronald L Fedie, Ph.D.
Associate Professor
Phone: 612-330-1069
Email: fedie@augsburg.edu

Vivian Feng, Ph.D.
Assistant Professor
Phone: 612-330-1074
Email: feng@augsburg.edu

Arlin E Gyberg, Ph.D.
Professor
Phone: 612-330-1080
Email: gyberg@augsburg.edu

Sandra L Olmsted, Ph.D.
Associate Professor
Phone: 612-330-1079
Email: olmsteds@augsburg.edu

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