Request for Undergraduate Addition, Deletion, or Change of a Major or Program

1. Prepare one paper copy and obtain signatures from the Department Chair/Head, Librarian, and College Dean. 2. Submit the form to your College Curriculum Committee. 3. After attaining the signature of the College Curriculum Chair, send the paper copy to the current University Curriculum Committee (UCC) Chair. 4. Send an identical (sans signatures) ELECTRONIC COPY and all supporting documentation in PDF format by email to the current UCC Chair.

College: Science  Department/Division: Chemistry
Contact Person: Michael Castellani  Phone: 6-6486

ACTION REQUESTED:

Check action requested:  ___Addition  ___Deletion  x Change

Name of Major (provide code if this is an existing major): SC50, BS Forensic Chemistry

RATIONALE:
The department has long offered two tracks of physical chemistry: CHM 357 and 358 for American Chemical Society-certified degrees, and CHM 307 for all other chemistry majors. CHM 307 was a broad survey course, offered every spring, and did not offer sufficient depth to students preparing for graduate and professional schools. With this change, students will be allowed to choose CHM 357 (fall) or CHM 358 (spring). This will offer students more flexibility in scheduling and a curriculum tailored to their career goals.

CURRICULUM: (If addition or change, number of hours and courses; indicate if required or optional) May be submitted as separate document.

Change a required course, "CHM 307," to "CHM 357 or CHM 358".

NOTIFICATION REQUIREMENTS:

Attach a copy of written notification regarding this curriculum request to the following:

1. Statement of Non-Duplication: If this major will be similar in title or content to an existing major at the university, please send a memo to the affected department and include it with this packet, as well as, the response received from the affected department.
2. If your department/division requires additional faculty, equipment, or specialized materials, attach an estimation of money and time required to secure these items.
3. Send a copy of this completed form to the Marshall University Catalog Editor.

SIGNATURES: (If disapproved at any level, do not sign. Return to previous signer.)

Department Chair/Division Head:  
Date: 1/21/2016

College Dean:  
Date: 1/27/2016

College Curriculum Chair:  
Date: 01/27/2016

University Curriculum Committee Chair:  
Date: 

Faculty Senate Chair:  
Date: 

VP Academic Affairs/VP Health Science:  
Date: 

University Curriculum Committee – Major Addition/Change/Deletion Form  Revised 02/2013
Courses offered by the Department of Chemistry provide programs of study that allow the individual to:

1. Obtain high quality instruction in chemistry as a scientific discipline.
2. Obtain a sound background in preparation for advanced studies.
3. Meet the qualifications of professional chemists and accrediting agencies.
4. Prepare for a professional career in chemistry, medicine, dentistry, pharmacy, medical technology, engineering, nursing and other fields.

High school students planning to major in chemistry are advised to take one year of high school chemistry, one year of high school physics, and at least three years of high school mathematics (including geometry, algebra, and trigonometry).

The curriculum and facilities of the department have been approved by the Committee on Professional Training of the American Chemical Society.

Curricula in Chemistry

B.S. Degree, Major in Chemistry: This major in chemistry is intended for students needing a broadly based, flexible science background. The requirements are as follows:

Requirements                                             Credit Hours
A. Science                                              59-75
   Chemistry 211, 212, 217, 218, 305, 355, 356, 361,
   387 (or 357 or 358 or 345, 432, 448)                33
   Upper division Chemistry electives                 3
   Capstone Experience - Chemistry 490 or 491         2
   Mathematics through 229 or 140                     3-8
   Physics 201-204 or (211, 202, 213, 204)            8
   Science and Mathematics electives                 10-19
B. General Electives from any college                  9-21

Students interested in careers in technical sales, management and marketing in the chemical industry are encouraged to take the following courses as electives: Economics 250, 253, Marketing 340, 440 or 442, Management 320.

* In this case, CHM 358 counts as an upper division elective.

B.S. Degree, Major in Biochemistry - Students completing the Biochemistry degree will be prepared for career opportunities in the biotechnology, forensics, environmental, pharmaceutical, agricultural, and medical fields. Students will also be well prepared for graduate-level study in biochemistry, biotechnology, and genetics and molecular biology. Additionally, Biochemistry is an excellent choice for students preparing for careers in Medicine, Dentistry, Pharmacy, Law or Engineering. The requirements are:

Requirements                                             Credit Hours
A. Science                                              80-88
   Chemistry 211, 212, 217, 218, 305, 355, 356, 361,
   345, 387 (or 357 or 358) 345, 365, 366, 432, 467   72-75
Upper division Chemistry electives† 3
Capstone Experience (Biochemistry Related) - Chemistry 490 or 481 2
Mathematics through either 229 (preferred) or 140 3.5
Physics 201-204 or (211, 202, 213, 204) 8
Biological Sciences 120, 121, 322, 324, and 450 19

B. General Electives from any college ................................................................. 11-14

*Recommended for students considering graduate school. CHM 358 counts as an upper division elective in this major.
†CHM 358 or 411 is recommended for students considering graduate school.

Note: The BSC coursework provides a Biological Sciences minor.

**B.S. Degree, Major in Forensic Chemistry:** This major is intended for students who wish to pursue a career in fields involving forensics. Students are strongly encouraged to engage in a Forensic Chemistry related Capstone Experience (CHM 491). The requirements are:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Science</td>
<td>80-82</td>
</tr>
<tr>
<td>Chemistry 211, 212, 217, 218, 305, 355, 356, 361, 345, 307 or 357 or 358, 365, 411, 432</td>
<td>36-40</td>
</tr>
<tr>
<td>Upper division Chemistry elective</td>
<td>3</td>
</tr>
<tr>
<td>Capstone Experience - Chemistry 490 or 491</td>
<td>2</td>
</tr>
<tr>
<td>Mathematics 140 or 229</td>
<td></td>
</tr>
<tr>
<td>Mathematics 225 or 345</td>
<td>6-8</td>
</tr>
<tr>
<td>Physics 201-204 or (211, 202, 213, 204)</td>
<td>8</td>
</tr>
<tr>
<td>Biology 120, 121 and either 322 or 324</td>
<td>12</td>
</tr>
<tr>
<td>Integrated Science and Technology 160, 341 and 445</td>
<td>7</td>
</tr>
<tr>
<td>Two courses from IST 340, BSC† 324, 450, or CHM† 428 or 467</td>
<td>6-8</td>
</tr>
</tbody>
</table>

B. General Humanities and Social Science Requirements ..................................... 6
Criminal Justice 314, and either 323 or 422

*In this case, CHM 358 counts as an upper division elective.
†Selection of one of the BSC courses provides a Biological Sciences minor, while selection of the IST course provides an Integrated Science and Technology minor. Chemistry courses may not be counted both as a chemistry elective and in this category.

**B.S. Degree, Major in Environmental Chemistry:** Students completing the environmental chemistry major will be prepared for career opportunities in environmental chemistry, toxicology, environmental policy, and consulting. Additionally, Environmental Chemistry is an excellent choice for students desiring to attend Professional training in Law, or Safety, or Industrial Hygiene. The requirements for this major are:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Science</td>
<td>82-90</td>
</tr>
<tr>
<td>Chemistry 211, 212, 217, 218, 305, 355, 356, 361, 307 or 357 or 358, 365, 411, 423, 432</td>
<td>36-40</td>
</tr>
<tr>
<td>Capstone Experience (Environmental chemistry related) - 490 or 491</td>
<td>2</td>
</tr>
<tr>
<td>Statistics: either BSC 417, IST 424, or MTH 345</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics through 140 or 229</td>
<td>3.5</td>
</tr>
<tr>
<td>Physics 201-204 or (211, 202, 213, 204)</td>
<td>8</td>
</tr>
<tr>
<td>Biological Sciences 120, 320, and 445</td>
<td>11</td>
</tr>
<tr>
<td>Integrated Science &amp; Technology 322 and 323</td>
<td>8</td>
</tr>
<tr>
<td>Geology 200</td>
<td>3</td>
</tr>
<tr>
<td>Environmental Science Electives†</td>
<td>(continued) 8</td>
</tr>
</tbody>
</table>
B. General College Humanities and Social Science Requirements

GEO 416 or 422

*Recommended for students considering graduate school, CHM 358 counts as an upper division elective in this major.

*Students should choose at least 8 credit hours from courses in the list below. Courses from a maximum of two departments may be selected. Students wishing a physical science emphasis may take all of the Geology electives and not take either BSC 445 or IST 323.

BSC 431, 446
CHM 467
GLY 320L, 420, 455, 455L, 456, 456L
IST 320, 321
PHY 412

B.S. in Chemistry Degree, ACS Certified: This curriculum meets the standards of the American Chemical Society and is recommended for students intending to enter the chemical profession or intending to pursue graduate work in chemistry. Students who successfully complete the requirements for the B.S. in Chemistry degree will receive a certificate from the American Chemical Society indicating that their degree meets the standards of the Committee on Professional Training. The requirements for this degree are:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Chemistry</td>
<td></td>
</tr>
<tr>
<td>Principles of Chemistry 211, 212, 217, 218</td>
<td>10</td>
</tr>
<tr>
<td>Organic Chemistry 355, 356, 361</td>
<td>9</td>
</tr>
<tr>
<td>Physical Chemistry 357, 358</td>
<td>8</td>
</tr>
<tr>
<td>Instrumental Methods 411</td>
<td>4</td>
</tr>
<tr>
<td>Research Methods in Chemistry 305</td>
<td>1</td>
</tr>
<tr>
<td>Introductory Biochemistry 365</td>
<td>3</td>
</tr>
<tr>
<td>Inorganic Chemistry 448</td>
<td>4</td>
</tr>
<tr>
<td>Capstone Experience - Chemistry 491</td>
<td>6</td>
</tr>
<tr>
<td>Seminars 331, 332, 431, 432</td>
<td>CR</td>
</tr>
<tr>
<td>B. Physics 211, 202, 213, 204 or equivalent</td>
<td>10</td>
</tr>
<tr>
<td>C. Mathematics through 231</td>
<td>13-16</td>
</tr>
</tbody>
</table>

Grade Point Average: A Grade Point Average of 2.0 in 1) all required Chemistry courses; 2) all Chemistry courses; and 3) all required Chemistry courses taken at Marshall will be required for all degrees.

Honors, Research, and Special Programs in Chemistry: The department offers a number of unique enrichment programs outside the above curricula that are open to students in either degree program. All entering students in chemistry should contact either the department office or their advisor for full details.

Minors: The Department of Chemistry does not require a minor with any of its majors.

Double Majors

Double majors within the Department of Chemistry may include any majors other than the B.S., Major in Chemistry. Double majors that include majors outside the Department of Chemistry may include any Department of Chemistry majors. For example, the B.S. Major in Chemistry could be used as a double major with any Biological Sciences major.

Minor in Chemistry

The Department of Chemistry awards a minor in chemistry to students who have completed the following courses with a minimum C average: CHM 211, 212, 217, 218, and any two additional courses chosen from CHM 307, 345, 355, 356, 357, 358, or 448.

ENVIRONMENTAL SCIENCE

See Integrated Science and Technology.