August 20, 2014

To: Dean Van Galen, Chancellor
    116 North Hall
    University of Wisconsin-River Falls

From: David P. Rainville, Chair
       Faculty Senate
       University of Wisconsin-River Falls

Re: UWRF Faculty Senate Motion 2014-15/4

At the August 20, 2014 meeting of the University of Wisconsin-River Falls Faculty Senate, motion 2014-15/4 was passed and is effective immediately. The motion is forwarded to you for your action.

Program change proposal: Chemistry Major – ACS

Approved ✓

Disapproved

________________________________________________________________________

Dean Van Galen, Chancellor  8/27/14  Date
TRANSMITTAL for UNDERGRADUATE PROGRAMS:
Changes or Proposals

I. INFORMATION:

1. Program Title: Chemistry-ACS
2. Department(s): Chemistry
3. College(s): CAS
4. Proposal prepared by: Karl Peterson Date: 4/15/2014
5. Check all that apply
   - New program
   - Existing program
   - Change in course name
   - Change in number of credits
   - Change in major
   - Change in minor
   - Change in course content
   - Change in emphasis/option

6. Other Programs/Departments Consulted (Requires letters of comment from all Departments or Programs substantially affected):
   a.
   b.
   c.
   d.

7. Catalog year (and semester) of Implementation: Semester Fall Year 2014

8. Have all courses in this program been approved? Yes ☐ No √
   If "No" which courses have not been approved? CHEM 380

9. Attach Request Narrative
   Include in narrative on attached pages a rationale for the requested changes or creation of program. Include clarification concerning any courses that have not yet been approved. If requesting a program change also include a listing of course array for both the current and proposed program.

10. UNIT APPROVALS: Requires signatures of all Department Chairs and Deans whose programs will be substantially affected by the changes or proposal. Signature lines for the affected Departments and Colleges (noted in "6" above), are on the addendum to this form. These signatures should be obtained prior to review by all other shared governance levels.

   Signature Date
   Department Curriculum Committee Chair (optional) Karl Peterson 4/15/2014
   Department/Program Chair Karl Peterson 4/15/2014
   College Curriculum Committee Chair 4/23/14
   Dean of College 4/23/14
   University Curriculum Cmtn. Chair Alex Tugan 4/25/14
   Academic Policy & Program Cmtn. Chair
   Faculty Senate Chair
   Provost / Vice Chancellor
   Chancellor

*NOTE: The master copy of this transmittal & accompanying documents must be filed in the Provost's office upon final approval. The Provost's office will notify all appropriate administrative offices [Registrar, Dean(s), Department Chair(s)] of approvals & necessary notions to implement changes.

Revised December 2012
Narrative for Program Change to the Chemistry-ACS, the Biochemistry-ACS, and the Biochemistry-Pre-Professional Programs

These proposed changes result from the creation of a new course, CHEM 380: Chemistry Junior Seminar (1 cr.). The results of this change increases the overall required credits in each of the majors by 1 credit. A comparison of the current Chemistry-ACS, Biochemistry-ACS, and Biochemistry-Pre-Professional programs and the corresponding proposed majors are attached to this document.

The addition of CHEM 380 will allow us to introduce the critical skills of literature searching (e.g., Reaxys, SciFinder, PubMed) and critical reading early in our curriculum, which addresses specific feedback that we obtained from our last accreditation evaluation by the American Chemical Society. Additionally, student will gain professional skills including resume and cover letter writing, searching for internships and jobs, and critical evaluation of seminars.

The Biotechnology Program and the Chemistry Department host student seminars at the same time and location. The Biotechnology Program requires a similar course (BIOT 380: Biotechnology Junior Seminar), and the Chemistry Department feels this course would benefit the chemistry students as well. The additional 1 credit will not significantly increase the total credits to graduate as these broad field majors do not require a minor. The following table summarizes the current and proposed credit requirements for the different programs:

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<tr>
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<th>Chemistry-ACS</th>
<th>Biochemistry-ACS</th>
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<tbody>
<tr>
<td>Current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Education¹²</td>
<td>29-34 cr</td>
<td>29-34 cr</td>
<td>29-34 cr</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>8-11 cr</td>
<td>8-11 cr</td>
<td>8-11 cr</td>
</tr>
<tr>
<td>Major + RSC</td>
<td>71-74 cr</td>
<td>77-79 cr</td>
<td>68-71 cr</td>
</tr>
<tr>
<td>Total</td>
<td>108-119 cr</td>
<td>114-124 cr</td>
<td>105-116 cr</td>
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¹ Note S and SL course will double count with the major. M course will double count with the required supporting courses.
² Assumes that the University requirements double counted.

Proposed

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</tr>
<tr>
<td>Major + RSC</td>
<td>72-75 cr</td>
<td>78-80 cr</td>
<td>69-72 cr</td>
</tr>
<tr>
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<td>109-120 cr</td>
<td>115-125 cr</td>
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Changes or Proposals

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1. Program Title: Chemistry-ACS
2. Department(s): Chemistry
3. College(s): CAS
4. Proposal prepared by: Karl Peterson Date: 4/15/2014
5. Check all that apply
   - [ ] New program
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   - [ ] Change in course name
   - [ ] Change in number of credits
   - [ ] Change in major
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6. Other Programs/Departments Consulted (Requires letters of comment from all Departments or Programs substantially affected):
   a. 
   b. 
   c. 
   d. 

7. Catalog year (and semester) of Implementation: Semester FA Year 2014
8. Have all courses in this program been approved? Yes [ ] No [x]
   If “No” which courses have not been approved? CHEM 380

9. Attach Request Narrative
   Include in narrative on attached pages a rationale for the requested changes or creation of program. Include clarification concerning any courses that have not yet been approved. If requesting a program change also include a listing of course array for both the current and proposed program.

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   Department Curriculum Committee Chair (optional)
   Karl Peterson 4/15/2014

   Department/Program Chair
   [Signature] 4/15/2014

   College Curriculum Committee Chair
   [Signature] 4/15/2014

   Dean of College
   [Signature] 4/15/2014

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<td>29-34 cr</td>
</tr>
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1 Note S and SL course will double count with the major. M course will double count with the required supporting courses.
2 Assumes that the University requirements double counted.
Track A Requirements: 55-58 cr. hrs.
CHEM 121 General Chemistry I (5 cr) OR
   CHEM 120 Introduction to General Chemistry (6 cr)
CHEM 122 General Chemistry II (5 cr)
CHEM 231 Organic Chemistry I (3 cr)
CHEM 232 Organic Chemistry II (3 cr)
CHEM 236 Organic Chemistry Lab I (1 cr)
CHEM 237 Organic Chemistry Lab II (1 cr)
CHEM 250 Foundations of Analytical Chemistry (4 cr)
CHEM 261 Laboratory Safety (2 cr)
CHEM 322 Inorganic Chemistry (includes a 1 cr. lab portion) (4 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
   CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 360 Foundations of Biochemistry (4 cr) OR
   CHEM 361 Biochemistry I (3 cr)
CHEM 480 Chemical Communications and Research (writing intensive) (1 cr)
BIOL 150 Introduction to Biology (3 cr)
MATH 167 Calculus II (4 cr)
MATH elective (3-4 cr)*
PHYS 121 and PHYS 122 General Physics I, II: Algebra-based (10 cr) OR
   PHYS 131 and PHYS 132 General Physics I, II: Calculus-based (10 cr)

In Depth Electives: 12 credits (incl. at least 6 lab credits, one of which must be CHEM 366 or 402).
CHEM 311 Polymer Chemistry (3 cr)
CHEM 316 Polymer Laboratory (1 cr)
CHEM 333 Organic Synthesis (2 cr)
CHEM 334 Organic Synthesis Lab (2 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
   CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 355 Separation Science Laboratory (1 cr)
CHEM 356 Chemical Instrumentation Lab (writing intensive) (1 cr)
CHEM 362 Biochemistry II (3 cr)
CHEM 366 Biochemistry Laboratory (writing intensive) (1 cr)
CHEM 378 Semester Abroad (1-4 cr)
CHEM 379 Internship (1-4 cr)
CHEM 401 Advanced Chemistry Lab I (writing intensive) (1 cr)
CHEM 402 Advanced Chemistry Lab II (writing intensive) (1 cr)
CHEM 411 Polymer Science (3 cr)
CHEM 416 Polymer Laboratory (1 cr)
CHEM 422 Advanced Inorganic Chemistry (writing intensive) (3 cr)
CHEM 461 Pharmacology (3 cr)
CHEM 489 Special Topics in Chemistry (1-4 cr)
CHEM 495 Undergraduate Research (1-3 cr)
BIOL 451 Molecular Biology (4 cr)
PHYS 465 Quantum Mechanics (4 cr)

Required Supporting Courses: 4 cr. hrs.
MATH 166 Calculus I (4 cr)
*Math electives could include: MATH 236: Discrete Mathematics, MATH 256: Linear Algebra, MATH 266: Calculus III, MATH 326: Applied Statistics, MATH 346: Numerical Analysis I, or PHYS 361: Mathematics of Physics & Engineering. All have a pre-requisite no higher than MATH 167.

**Track B Requirements: 55 - 57 cr. hrs.**
CHEM 130 Introduction to Organic Chemistry (5 cr)
CHEM 233 Foundations of Organic Chemistry (5 cr)
CHEM 240 Principles of General Chemistry (4 cr)
CHEM 250 Foundations of Analytical Chemistry (4 cr)
CHEM 261 Laboratory Safety (2 cr)
CHEM 322 Inorganic Chemistry (includes a 1 cr. lab portion) (4 cr)
CHEM 333 Organic Synthesis (2 cr)
CHEM 334 Organic Synthesis Lab (2 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
   CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 360 Foundations of Biochemistry (4 cr) OR
   CHEM 361 Biochemistry I (3 cr)
CHEM 480 Chemical Communications and Research (writing intensive) (1 cr)
BIOL 150 Introduction to Biology (3 cr)
MATH 167 Calculus II (4 cr)
MATH elective (3-4 cr)*
PHYS 121 and PHYS 122 General Physics I, II: Algebra-based (10 cr) OR
   PHYS 131 and PHYS 132 General Physics I, II: Calculus-based (10 cr)

**In Depth Electives: 12 credits (incl. at least 3 lab credits, one of which must be CHEM 366 or 402).**
CHEM 311 Polymer Chemistry (3 cr)
CHEM 316 Polymer Laboratory (1 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
   CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 355 Separation Science Laboratory (1 cr)
CHEM 356 Chemical Instrumentation Lab (writing intensive) (1 cr)
CHEM 362 Biochemistry II (3 cr)
CHEM 366 Biochemistry Laboratory (writing intensive) (1 cr)
CHEM 378 Semester Abroad (1-4 cr)
CHEM 379 Internship (1-4 cr)
CHEM 401 Advanced Chemistry Lab I (writing intensive) (1 cr)
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BIOL 451 Molecular Biology (4 cr)
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MATH 166 Calculus I (4 cr)

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PROPOSED
Chemistry - ACS Major (68-71 cr. hrs.)
(72-75 cr. hrs. including required supporting courses)

Track A Requirements: 56-59 cr. hrs.
CHEM 121 General Chemistry I (5 cr) OR
    CHEM 120 Introduction to General Chemistry (6 cr)
CHEM 122 General Chemistry II (5 cr)
CHEM 231 Organic Chemistry I (3 cr)
CHEM 232 Organic Chemistry II (3 cr)
CHEM 236 Organic Chemistry Lab I (1 cr)
CHEM 237 Organic Chemistry Lab II (1 cr)
CHEM 250 Foundations of Analytical Chemistry (4 cr)
CHEM 261 Laboratory Safety (2 cr)
CHEM 322 Inorganic Chemistry (includes a 1 cr. lab portion) (4 cr)
CIEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
    CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 360 Foundations of Biochemistry (4 cr) OR
    CHEM 361 Biochemistry I (3 cr)
CHEM 380 Chemistry Junior Seminar (1 cr)
CHEM 480 Chemical Communications and Research (writing intensive) (1 cr)
Biol 150 Introduction to Biology (3 cr)
MATH 167 Calculus II (4 cr)
MATH elective (3-4 cr)*
PHYS 121 and PHYS 122 General Physics I, II: Algebra-based (10 cr) OR
    PHYS 131 and PHYS 132 General Physics I, II: Calculus-based (10 cr)

In Depth Electives: 12 credits (incl. at least 6 lab credits, one of which must be CHEM 366 or 402).
CHEM 311 Polymer Chemistry (3 cr)
CHEM 316 Polymer Laboratory (1 cr)
CHEM 333 Organic Synthesis (2 cr)
CHEM 334 Organic Synthesis Lab (2 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
    CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 355 Separation Science Laboratory (1 cr)
CHEM 356 Chemical Instrumentation Lab (writing intensive) (1 cr)
CHEM 362 Biochemistry II (3 cr)
CHEM 366 Biochemistry Laboratory (writing intensive) (1 cr)
CHEM 378 Semester Abroad (1-4 cr)
CHEM 379 Internship (1-4 cr)
CHEM 401 Advanced Chemistry Lab I (writing intensive) (1 cr)
CHEM 402 Advanced Chemistry Lab II (writing intensive) (1 cr)
CHEM 422 Advanced Inorganic Chemistry (writing intensive) (3 cr)
CHEM 461 Pharmacology (3 cr)
CHEM 489 Special Topics in Chemistry (1-4 cr)
CHEM 495 Undergraduate Research (1-3 cr)
Biol 451 Molecular Biology (4 cr)
PHYS 465 Quantum Mechanics (4 cr)

Required Supporting Courses: 4 cr. hrs.
MATH 166 Calculus I (4 cr)
*Math electives could include: MATH 236: Discrete Mathematics, MATH 256: Linear Algebra, MATH 266: Calculus III, MATH 326: Applied Statistics, MATH 346: Numerical Analysis I, or PHYS 361: Mathematics of Physics & Engineering. All have a pre-requisite no higher than MATH 167.

**Track B Requirements: 56 - 58 cr. hrs.**
CHEM 130 Introduction to Organic Chemistry (5 cr)
CHEM 233 Foundations of Organic Chemistry (5 cr)
CHEM 240 Principles of General Chemistry (4 cr)
CHEM 250 Foundations of Analytical Chemistry (4 cr)
CHEM 261 Laboratory Safety (2 cr)
CHEM 322 Inorganic Chemistry (includes a 1 cr. lab portion) (4 cr)
CHEM 333 Organic Synthesis (2 cr)
CHEM 334 Organic Synthesis Lab (2 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
   CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 360 Foundations of Biochemistry (4 cr) OR
   CHEM 361 Biochemistry I (3 cr)
CHEM 380 Chemistry Junior Seminar (1 cr)
CHEM 480 Chemical Communications and Research (writing intensive) (1 cr)
BIOL 150 Introduction to Biology (3 cr)
MATH 167 Calculus II (4 cr)
MATH elective (3-4 cr)*
PHYS 121 and PHYS 122 General Physics I, II: Algebra-based (10 cr) OR
   PHYS 131 and PHYS 132 General Physics I, II: Calculus-based (10 cr)

**In Depth Electives: 12 credits (incl. at least 3 lab credits, one of which must be CHEM 366 or 402).**
CHEM 311 Polymer Chemistry (3 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
   CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 355 Separation Science Laboratory (1 cr)
CHEM 356 Chemical Instrumentation Lab (writing intensive) (1 cr)
CHEM 362 Biochemistry II (3 cr)
CHEM 366 Biochemistry Laboratory (writing intensive) (1 cr)
CHEM 378 Semester Abroad (1-4 cr)
CHEM 379 Internship (1-4 cr)
CHEM 401 Advanced Chemistry Lab I (writing intensive) (1 cr)
CHEM 402 Advanced Chemistry Lab II (writing intensive) (1 cr)
CHEM 411 Polymer Science (3 cr)
CHEM 416 Polymer Laboratory (1 cr)
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CHEM 461 Pharmacology (3 cr)
CHEM 489 Special Topics in Chemistry (1-4 cr)
CHEM 495 Undergraduate Research (1-3 cr)
BIOL 451 Molecular Biology (4 cr)
PHYS 465 Quantum Mechanics (4 cr)

**Required Supporting Courses: 4 cr. hrs.**
MATH 166 Calculus I (4 cr)

*Math electives could include: MATH 236: Discrete Mathematics, MATH 256: Linear Algebra, MATH 266: Calculus III, MATH 326: Applied Statistics, MATH 346: Numerical Analysis I, or PHYS 361: Mathematics of Physics & Engineering. All have a pre-requisite no higher than MATH 167.
PROPOSED
Biochemistry Pre-Professional Major (65-68)
(69-72 cr. hrs. including required supporting courses)

Track A Requirements: 58-60 cr. hrs.
CHEM 121 General Chemistry I (5 cr) or
   CHEM 120 Introduction to General Chemistry (6 cr)
CHEM 122 General Chemistry II (5 cr)
CHEM 231 Organic Chemistry I (3 cr)
CHEM 232 Organic Chemistry II (3 cr)
CHEM 236 Organic Chemistry Lab I (1 cr)
CHEM 237 Organic Chemistry Lab II (1 cr)
CHEM 250 Foundations of Analytical Chemistry (4 cr)
CHEM 261 Laboratory Safety (2 cr)
CHEM 322 Inorganic Chemistry (includes a 1 cr. lab portion) (4 cr)
CHEM 340 Physical Chemistry of Biological Systems (3 cr)
CHEM 361 Biochemistry I (3 cr)
CHEM 362 Biochemistry II (3 cr)
CHEM 366 Biochemistry Laboratory (writing intensive) (1 cr)
CHEM 380 Junior Chemistry Seminar (1 cr)
CHEM 480 Chemical Communications and Research (writing intensive) (1 cr)
BIOL 150 Introduction to Biology (3 cr)
MATH elective (3-4 cr)
PHYS 121 and PHYS 121 General Physics I, II: Algebra-based (10 cr) OR
   PHYS 131 and PHYS 132 General Physics I, II: Calculus-based (10 cr)

In Depth Electives: 8 credits minimum including least 3 lab credits. Choose from:
CHEM 311 Polymer Chemistry (3 cr)
CHEM 316 Polymer Laboratory (1 cr)
CHEM 333 Organic Synthesis (2 cr)
CHEM 334 Organic Synthesis Laboratory (2 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
   CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 355 Separation Science Laboratory (1 cr)
CHEM 356 Chemical Instrumentation Lab (writing intensive) (1 cr)
CHEM 378 Semester Abroad (1-4 cr)
CHEM 379 Internship (1-4 cr)
CHEM 401 Advanced Chemistry Lab I (writing intensive) (1 cr)
CHEM 402 Advanced Chemistry Lab II (writing intensive) (1 cr)
CHEM 422 Advanced Inorganic Chemistry (writing intensive) (3 cr)
CHEM 461 Pharmacology (3 cr)
CHEM 489 Special Topics in Chemistry (1-4 cr)
CHEM 495 Undergraduate Research (1-3 cr)
BIOL 350 Genetics and Evolution (writing intensive) (3 cr)
BIOL 451 Molecular Biology (4 cr)

Required Supporting Courses: 4 cr. hrs.
MATH 166 Calculus I (4 cr)
Track B Requirements: 52-53 cr. hrs.
CHEM 130 Introduction to Organic Chemistry (5 cr)
CHEM 233 Foundations of Organic Chemistry (5 cr)
CHEM 240 Principles of General Chemistry (4 cr)
CHEM 250 Foundations of Analytical Chemistry (4 cr)
CHEM 261 Laboratory Safety (2 cr)
CHEM 322 Inorganic Chemistry (includes a 1 cr. lab portion) (4 cr)
CHEM 340 Physical Chemistry of Biological Systems (3 cr)
CHEM 361 Biochemistry I (3 cr)
CHEM 362 Biochemistry II (3 cr)
CHEM 366 Biochemistry Laboratory (writing intensive) (1 cr)
CHEM 380 Junior Chemistry Seminar (1 cr)
CHEM 480 Chemical Communications and Research (writing intensive) (1 cr)
BIOL 150 Introduction to Biology (3 cr)
MATH elective (3-4 cr)
PHYS 121 and PHYS 121 General Physics I, II: Algebra-based (10 cr) OR
PHYS 131 and PHYS 132 General Physics I, II: Calculus-based (10 cr)

In Depth Electives: 13 credits minimum with at least 2 lab credits. Choose from:
CHEM 311 Polymer Chemistry (3 cr)
CHEM 316 Polymer Laboratory (1 cr)
CHEM 333 Organic Synthesis (2 cr)
CHEM 334 Organic Synthesis Laboratory (2 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 355 Separation Science Laboratory (1 cr)
CHEM 356 Chemical Instrumentation Lab (writing intensive) (1 cr)
CHEM 378 Semester Abroad (1-4 cr)
CHEM 379 Internship (1-4 cr)
CHEM 401 Advanced Chemistry Lab I (writing intensive) (1 cr)
CHEM 402 Advanced Chemistry Lab II (writing intensive) (1 cr)
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Required Supporting Courses: 4 cr. hrs.
MATH 166 Calculus I (4 cr)