TRANSMITTAL for UNDERGRADUATE PROGRAMS:
Changes or Proposals

I. INFORMATION:

1. Program Title: Chemistry ACS Major
2. Department(s): Chemistry
3. College(s): College of Arts and Sciences
4. Proposal prepared by: Barb Nielsen Date: 4/17/13
5. Check all that apply
   - New program
   - Change in course name
   - Change in major
   - Change in course content
   - Existing program
   - Change in number of credits
   - Change in minor
   - 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 2013
8. Have all courses in this program been approved? Yes ☑ No ☐
   If “No” which courses have not been approved:

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.

<table>
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<th>Signature</th>
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<tr>
<td>Department Curriculum</td>
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<tr>
<td>Committee Chair (optional)</td>
<td>Barbara A. Nielsen 4/17/13</td>
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<tr>
<td>Department/Program Chair</td>
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<tr>
<td></td>
<td>Kathi Pot 4/17/13</td>
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<td>College Curriculum Committee Chair</td>
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<tr>
<td>University Curriculum Cmtt. Chair</td>
<td>Alex Tupa 5/06/13</td>
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<td>Academic Policy &amp; Program Cmtt. Chair</td>
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<td>Faculty Senate Chair</td>
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<td>Provost / Vice Chancellor</td>
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<td>Chancellor</td>
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*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 actions to implement changes.
TRANSMITTAL for UNDERGRADUATE PROGRAMS: Changes or Proposals - Addendum

Signatures of Additional Department & Colleges Affected

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Narrative for Program Change to the Chemistry ACS Major

In 2012 the Chemistry Department redesigned its Program to include three broad field major subplans, including: Chemistry ACS (68-70 cr.), Biochemistry ACS (73-75 cr.), and Biochemistry Pre-Professional (67-69 cr.). The Chemistry Department seeks to change the course requirements for the Chemistry ACS Major. These changes include (a) allowing CHEM 360: Foundations of Biochemistry (4 cr.) or CHEM 361: Biochemistry I (3 cr.), (b) substituting CHEM 333: Organic Synthesis (2 cr.) and CHEM 334: Organic Synthesis Lab (2 cr.), and (c) requiring an additional 3 credits of In Depth Electives.

These proposed changes result from the creation of a new course (CHEM 360: Foundations of Biochemistry (4 cr.)) and the splitting of the original CHEM 333: Synthetic Organic Chemistry (4 cr.) into CHEM 333: Organic Synthesis (2 cr.) and CHEM 334: Organic Synthesis Lab (2 cr.). Additionally, the Chemistry ACS majors will be required to take three more In Depth Elective credits, increasing the total credits for the Chemistry ACS major to 71-73 cr. which is more aligned with the Biochemistry ACS major. A comparison of the current Chemistry ACS major and the proposed Chemistry ACS major is attached to this document.

Students pursuing the Chemistry ACS Major are the students who wish to go on to graduate school in Chemistry. The Chemistry Department feels this increase in credits is necessary to provide these students the opportunity to investigate some chemical concepts beyond the foundational level of the required courses. The additional 3 credits will not significantly increase the total credits to graduate as this broad field major does not require a minor. Thus, assuming the American Cultural Diversity and Global Perspective credits are double counted elsewhere, students can complete this degree program along with the University, College of Liberal Arts, and General Education requirements in 108-112 credits, well below the required 120 credits for graduation.
CURRENT
Chemistry - ACS Major (64-66 cr. hrs.)
(68-70 cr. hrs. including required supporting courses)

Track A Requirements: 55-57 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 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 151/156 and PHYS 152/157 General Physics I, II (Lecture and Lab) (10 cr) OR
   PHYS 161/166 and PHYS 162/167 General Physics I,II (Calculus based Lecture and Lab) (10 cr)

In Depth Electives: 9 credits (incl. at least 6 lab credits, one of which must be CHEM 366 or 402).
CHEM 311 Polymer Chemistry (3 cr)
CHEM 333 Synthetic Organic Chemistry (4 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 - 56 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 Synthetic Organic Chemistry (4 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
   CHEM 342 Molecular Structure and Spectroscopy (3 cr)
CHEM 361 Biochemistry 1 (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 151/156 and PHYS 152/157 General Physics I, II (Lecture and Lab) (10 cr) OR
   PHYS 161/166 and PHYS 162/167 General Physics I,II (Calculus based Lecture and Lab (10 cr)

In Depth Electives: 9 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)
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.
PROPOSED
Chemistry - ACS Major (67-69 cr. hrs.)
(71-73 cr. hrs. including required supporting courses)

Track A Requirements: 55-57 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 151/156 and PHYS 152/157 General Physics I, II (Lecture and Lab) (10 cr) OR
PHYS 161/166 and PHYS 162/167 General Physics I,II (Calculus based Lecture and Lab) (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 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)
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CHEM 416 Polymer Laboratory (1 cr)
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BIOL 451 Molecular Biology (4 cr)
PHYS 465 Quantum Mechanics (4 cr)

Required Supporting Courses: 4 cr. hrs.
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CHEM 341 Chemical Thermodynamics and Kinetics (3 cr) OR
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CHEM 360 Foundations of Biochemistry (4 cr) OR
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CHEM 480 Chemical Communications and Research (writing intensive) (1 cr)
BIOL 150 Introduction to Biology (3 cr)
MATH 167 Calculus II (4 cr)
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PHYS 151/156 and PHYS 152/157 General Physics I, II (Lecture and Lab) (10 cr) OR
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   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.