TRANSMITTAL for UNDERGRADUATE PROGRAMS: Changes or Proposals

INFORMATION

1. Program title:  Chemistry -- Education Major
2. Department(s): Chemistry
3. College(s): Ceps
4. Proposal prepared by: Barb Nielsen Date: 2/16/2012

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 support from all Departments or Programs substantially affected):

1. CEPS
2.
3.
4.

7. Date of Implementation: Fall Semester 2012 Year

8. Have all courses in this program been approved? Yes ☐ No ☑
If “No,” which ones? Chem 261 And Chem 322

9. Attach Request Narrative. (Include description of program before and after proposed changes).

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

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td>Karl P. Peterson</td>
<td>3/1/2012</td>
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<tr>
<td>Dean of College</td>
<td>3/19/2012</td>
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<tr>
<td>Barbara S. Nelson</td>
<td>3/30/2012</td>
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<tr>
<td>Provost / Vice Chancellor</td>
<td>7/26/2012</td>
</tr>
<tr>
<td>Chancellor</td>
<td>7/31/2012</td>
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NOTE: The master copy of this transmittal and 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), and Department Chair(s)] of approvals and necessary actions to implement changes.

Rev. 11/08
Narrative for Conversion of Chemistry Majors to Broad Field Majors

The UWRF Chemistry Department seeks to convert the chemistry major to a broad field major and reduce the number of subplans. In order for a major to be considered “broad field” it must have 56-60 credits, not all of which are from the major department. Due to the increased credit load, students completing a broad field major are not required to declare a minor area of study. Additionally we seek to revise the course requirements for the Chemistry Education major.

The Chemistry Department is accredited by the American Chemical Society (ACS) and the programs we offer follow guidelines set by the ACS Committee on Professional Training (CPT). In order to meet the current guidelines, the Chemistry Department proposes to make essential changes to the various Chemistry major subplans. These changes involve decreasing the number of major subplans, providing more flexibility in upper division course offerings, counting courses from outside the Chemistry Department, streamlining the total number of credits by allowing more credits from the major and supporting courses to double count in the General Education requirement, and ensuring transparency in the course requirements (i.e., no “hidden” pre-requisites). This built-in efficiency will effectively reduce the credits to degree for chemistry majors. In addition, CHEM 378: Study Abroad is included as an in-depth elective, acknowledging the University’s mission to help prepare students to be engaged citizens with an informed global perspective.

The two guidelines driving the Chemistry Department’s decision to evaluate and update our curriculum stem from the new curricular requirements and the need for the development of specific student skills. The curricular requirements should provide a foundation in the five chemistry subdisciplines of Analytical, Biochemistry, Inorganic, Organic, and Physical Chemistry. Additionally, students should have in-depth courses to build on this foundation and 400 laboratory hours beyond general chemistry, some of which may be in the form of independent research. The areas and content covered in these in-depth courses are flexible, but a department must offer at least four annually. Further, effective student skills in problem solving, oral and written communication, the use of chemical literature, laboratory safety, teamwork, and the ethical practice of science are emphasized in the guidelines.

Currently the Chemistry Department offers two Chemistry majors. The first is Chemistry (with six subplans) and the second is Chemistry Education. The six subplans for the Chemistry major include: Liberal Arts (LA) Chemistry, ACS Chemistry, ACS Biochemistry, LA Biochemistry, ACS Polymer Option 1, and ACS Polymer Option 2. We propose to decrease the number of subplans in the Chemistry major to three: Chemistry ACS, Biochemistry ACS, and Biochemistry - Pre-Professional. The additional subplans are not necessary because the CPT no longer recognizes “options” within the majors and no longer requires the courses that differentiated the subplans. A comparison of the current Chemistry major and the proposed is shown in Table 1. By rearranging the array of in-depth elective courses, we are reducing the number of subplans and giving students more flexibility in devising their individualized Chemistry major.
<table>
<thead>
<tr>
<th>Current Chemistry Major</th>
<th>Proposed Chemistry Major</th>
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<tbody>
<tr>
<td>Liberal Arts (LA) Chemistry (Regular)</td>
<td>Chemistry - ACS</td>
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<tr>
<td>ACS Chemistry</td>
<td>Biochemistry - ACS</td>
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<tr>
<td>ACS Chemistry: Biochemistry Option</td>
<td>Biochemistry - Pre-Professional</td>
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<tr>
<td>ACS Chemistry: Polymer Option 1</td>
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</tr>
<tr>
<td>ACS Chemistry: Polymer Option 2</td>
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<tr>
<td>LA Biochemistry</td>
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In general, the format for the proposed subplans includes required courses, in-depth electives, and required supporting courses. The Chemistry Education major is modified to incorporate these curricular changes, following the same general format with additional requirements imposed by the Secondary Education Major.
(Current) Chemistry Education Major (36-37 cr. hrs.)
(w/ supporting courses: 57-58 cr. hrs)

Secondary Education Major Requirements: 42 cr. hrs.
TED 120 Introduction to Education and Instructional Technology (3 cr)
TED 212 Educational Psychology: Middle & Secondary Education (5 cr)
TED 252 Foundations of Multicultural Education (d) (3 cr)
TED 414 Development of the Transescent (4 cr)
TED 420 School and Society (3 cr)
TED 434 Techniques in Science (3)
TED 462 Content Area Literacy for Science (3)
TED 465 Management Strategies for Science (3)
TED 473 Student Teaching: Middle School (6)
TED 474 Student Teaching: Secondary Education (6)
SPED 330 Introduction to Special Education (3)

Track A Requirements: 36 - 37 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 341 Chemical Thermodynamics and Kinetics (3 cr)
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 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 480 Chemical Communications and Research (writing intensive) (1 cr)

Track B Requirements: 36 cr. hrs.
CHEM 130 Introduction to Organic Chemistry (5 cr)
CHEM 233 Foundations of Organic Chemistry (5 cr)
CHEM 240 Foundations of Inorganic Chemistry (4 cr)
CHEM 250 Foundations of Analytical Chemistry (4 cr)
CHEM 333 Organic Synthesis (4 cr)
CHEM 341 Chemical Thermodynamics and Kinetics (3 cr)
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 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 480 Chemical Communications and Research (writing intensive) (1 cr)

**Required Supporting Courses: 21 cr. hrs.**
MATH 166 Calculus I (4 cr)
MATH 167 Calculus II (4 cr)
MATH 266 Calculus III (3 cr)
PHYS 151/155 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 this proposed Chemistry Education major, the changes are highlighted in bold text. Under **Requirements**, these changes include: the addition of two new courses (CHEM 261 and CHEM 322); the addition of BIOL 150 (a pre-requisite to CHEM 361); the option to take either CHEM 341 or CHEM 342; the addition of CHEM 361; the inclusion of MATH 167; and the option to take either PHYS 151/156 and 152/157 or PHYS 161/166 and 162/167. Further, there is only one **Required Supporting Course** (MATH 166) which is a pre-requisite for the required MATH 167. As a required supporting course, MATH 166 meets the MATH requirement for General Education.

(Proposed) Chemistry Education Major (52-53 cr. hrs.)
(w/ supporting classes: 56-57 cr. hrs)

**Secondary Education Major Requirements:** 42 cr. hrs.

Requirements: 52-53 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 356** Chemical Instrumentation Lab (writing intensive) (1 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)
**PHYS 151/155 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)

Required Supporting Courses: 4 cr. hrs.

**MATH 166** Calculus I (4 cr)
I approve the 42 credits of Professional Education courses and the changes in this Chemistry Education Major.

From: Barbara Nielsen  
Sent: Thursday, February 23, 2012 3:39 PM  
To: Teri Crotty  
Subject: RE: 42 credits TED  

Teri,  
Thank you for your help. I think I may have it now. I am assuming that TED 434, TED 462, and TED 4565 are all 3 credit classes. This would make the total credits from CEPS 42. (I think the extra 3 credits comes into play if the student needs a TED minor.) I am attaching the latest version for you to check out. Am I forgetting anything? Thank you.
Barb

From: Teri Crotty  
Sent: Thursday, February 23, 2012 2:52 PM  
To: Barbara Nielsen  
Subject: RE: 42 credits TED  

TED 422 is now TED 462, Content Area Literacy for Science, and TED 423 is now TED 465, Management Strategies for Science. (TED 422 is still offered for K-12 majors). These should total only 42 credits with 8 credits in Middle School student Teaching and 6 credits in Secondary Student Teaching. I do not know where you would get the extra 3 to = 45?? Hope this helps.

From: Barbara Nielsen  
Sent: Thursday, February 23, 2012 2:33 PM  
To: Teri Crotty  
Cc: Michael Harris  
Subject: RE: 42 credits TED

Thanks Teri and Mike.  
We did not realize anything was wrong with the TED listing because that is not what we were changing. Our plan sheets for this major do require 42-45 credits of TED requirements. These courses include: TED 120, TED 212, TED 252(d), TED 414, TED 420, TED 422, TED 423, TED 434, TED 473/474, SPED 330, and the TED minor unless both major and minor are in the science area. Are these the correct required courses? I couldn't find TED 423--has it been replaced or renumbered?

I am attaching a new proposed Chemistry Education major. Thank you for your input.
Barb

From: Teri Crotty  
Sent: Thursday, February 23, 2012 1:35 PM  
To: Barbara Nielsen  
Subject: 42 credits TED  

Barbara,  
Yes, Mike Martin sent the request to me. The Department Chair's support is required. I am not able to support your program without knowing what Professional Education Courses you have identified for this program. You indicate only 35 to 36 credits when in fact all program require 42 professional education credits. I tried to verify the professional education courses on your WEB site,
but they are not identified there either. Mike Harris is visiting Karl today, so perhaps he can get clarification.

From: Barbara Nielsen  
Sent: Thursday, February 23, 2012 10:11 AM  
To: Teri Crotty  
Subject: RE: A request for support for the new BFS programs

Teri,
I am not sure that I asked you for anything UNLESS Mike Martin spoke to you regarding the Chemistry Education major. If that is the case, then the answer is no. What I am seeking is support of the regular Chemistry Education major (that we have listed in the catalog under the Chemistry Department options.) I understand the confusion, because I am just figuring this out as well.

The Chemistry Department is in the process of changing the majors they offer. In doing that, we felt the need to make the Chemistry Ed major better resemble the Chemistry majors. I am attaching our proposal for the new Chemistry ACS major and the proposal for the new Chemistry Ed major so you can see the similarities. We are proposing a Program Change, so there is a lot of information that you will not be interested in reading. The information pertinent to you for comparison will be on the "Proposed (Track A) Chemistry -ACS Major" and the "Proposed Chemistry Education Major". Please let me know if you have any questions and if you support the change.

Thank you.