• In section A, list ALL of the forms covered by this signature page. If you submit a form that is not listed in A, your proposal will be held back until we receive a new, updated signature page.
• You must obtain the signature of your department chair and dean before submitting your proposal.

A. FORMS COVERED BY THIS SIGNATURE PAGE. List each form you are submitting—for instance, PSYC 383, Course Form; PSYC, Change of Major Form; PSYC, Change of Minor Form.

New Course Form: HONS 190
New Course Form: HONS 190L
Change Program Form: Chemistry BA
Change Program Form: Chemistry BS
Change Program Form: Biochemistry BS
Change Minor Form: Chemistry minor
Deactivate Course Form: HONS 191/191L and HONS 294/294L

In addition, the following required materials are included:

Proposed Syllabus HONS 190
Proposed Syllabus HONS 190L
Program of Study Modifications, Chemistry BA
Program of Study Modifications, Chemistry BS
Program of Study Modifications, Biochemistry BS
Letter of Support Honors
Letter of Acknowledgement Biology
   (Note: Biology is sending in forms for changes separately)
Letter of Acknowledgement Exercise Science
Letter of Acknowledgement Geology
   (Note: Geology is sending in forms for changes separately)
Letter of Acknowledgement Computer Science
B. APPROVAL AND SIGNATURES.

1. Signature of Department Chair or Program Director:
   [Signature] Date: 12-3-15

2. Signature of Academic Dean:
   [Signature] Date: 12-5-15

3. Signature of Provost:
   [Signature] Date: 2/5/16

4. Signature of Business Affairs (only for course fees):
   [Signature] Date:

5. Signature of Curriculum Committee Chair:
   [Signature] Date: 3-1-16

6. Signature of Budget Committee Chair (only for new programs):
   [Signature] Date:

7. Signature of Academic Planning Committee Chair (only for new programs):
   [Signature] Date:

8. Signature of Faculty Senate Secretary:
   [Signature] Date:

Date Approved by Faculty Senate:

☐ fee approved on ________
☐ BOT approval pending
October 2, 2015

To: College Curriculum Committee
From: Pamela Riggs-Gelasco
Chair, Chemistry and Biochemistry
RE: HONS chemistry curriculum

The Chemistry Department would like to change its Honor Sequence.

The current curriculum in place since 2011 is:
HONS 191/191L (4 credits) General Chemistry I (Course equivalent to Chem 111)
HONS 192/192L (4 credits) Organic Chemistry I (Course equivalent to Chem 231)
HONS 293/293L (4 credits) Organic Chemistry II (Course equivalent to Chem 232)
HONS 294/294L (4 credits) General Chemistry II (Course equivalent to Chem 112)

The proposed new sequence involves a new accelerated 5-credit course, HONS 190/190L, that would replace 191/191L and 294/294L. Qualified Honors students would take this course their freshmen year and would then initiate the organic honors courses 192 and 293. This accelerated course would facilitate progress through the curriculum for biology, biochemistry, and chemistry majors.

HONS 190/190L (5 credits) Accelerated General Chemistry I and II
HONS 192/192L (4 credits) Honors Organic Chemistry I
HONS 293/293L (4 credits) Honors Organic Chemistry II

The following forms are attached:

New Course Form: HONS 190
New Course Form: HONS 190L
Change Program Form: Chemistry BA
Change Program Form: Chemistry BS
Change Program Form: Biochemistry BS
Change Minor Form: Chemistry minor
Deactivate Course Form: HONS 191/191L and HONS 294/294L
Proposed Syllabus HONS 190
Proposed Syllabus HONS 190L
Program of Study Modifications, Chemistry BA
Program of Study Modifications, Chemistry BS
Program of Study Modifications, Biochemistry BS
Letter of Support Honors
Letter of Acknowledgement Biology
  (Note: Biology is sending in forms for changes separately)
Letter of Acknowledgement Exercise Science
Letter of Acknowledgement Geology
  (Note: Geology is sending in forms for changes separately)
Letter of Acknowledgement Computer Science
In our meeting with the registrar to discuss these changes, the following questions were raised; our response to these questions follows.

Q1: What happens if a student flunks the lab HONS 190L and passes HONS 190 lecture.

A1: An Honors student failing lab is highly unlikely; no Honors student has failed the general chemistry lab from Fall 2010-2014. This is in part because they are stellar students and in part because a large portion of a grade in lab is doing the lab (i.e. experiential). A student would be much more likely to fail the lecture but pass the lab. However, because labs are experiential, we have a very stringent attendance policy, even if students are sick. Too many missed labs (typically 3) result in a WA, regardless for the reason the lab was missed. In such a case, the student could wait a year to retake HONS 190L or they could enroll in Chem 111/Chem 111L and plan on taking the normal sequence. However, depending on the scenario, the reason for the failure, and the particular labs that were missed, two possible accommodations could be made. In the “sick” scenario, the lab instructor may allow for makeup of lab to avoid the WA for a student, even if this required an incomplete grade initially. This might depend on how readily a lab could be re-set, the instructor’s availability, the availability of material and equipment, whether the lab was part of a larger sequence of labs, etc. Second, depending on the academic strength of the student, we could approve enrollment in the next course HONS 192/192L, even though the lab for HONS 190L was not yet completed. These two solutions are possible, but will not be advertised or guaranteed, because they would be situation dependent.

Q2: What happens if a student flunks HONS 190 lecture?

A2: The student would be directed to take 111/112 sequence instead of Honors sequence.

Q3: If and when this course is approved as part of a Gen Ed sequence, what happens to a student who passes HONS 190/190L, but decides to drop the Honors College, how will they get their Gen Ed?

A3: We plan to ask for HONS 190/190L + HONS 192/192L and for HONS 190/190L + Chem 112/Chem 112L to be approved as Gen Ed sequences. A student who quits the Honors College after completing HONS 190/190L can take another science sequence for their Gen Ed (if they are science majors, this is not an issue) or they can take Chem 112/112L to finish an approved Chem sequence.

Q4: For the aforementioned student, the next class in the sequence (non-Honors) is Chem 231. Do you plan to ask for Hons 190+Chem 231 (Organic) to be a new Gen Ed sequence for the convenience of such a student?
A4: No, we do not want to assess 300 more students for the once in 10 year scenario of a student who completes HONS 190, drops out of Honors, needs to go on to Chem 231 and isn't taking any more science other than Chem 231. That might be the case for a Chemistry BA major. That student, like every other student on campus, will need to find an approved science sequence to take. That can include taking Chem 112 after HONS 190 or finding another science sequence that appeals to them in another department. Our advice to that student will be: don't drop out of the Honors program until after you complete HONS 192, which would be approved as Gen Ed. Please note that we anticipate about 1/3 of the students enrolled in this class will already have AP credit for Chem 112, so such a student would already have fulfilled Gen Ed in Chemistry.

Q5: This new class is intended to give students the same background as taking Chem 111 and Chem 112. Can students take Chem 111 and Chem 112 after completing HONS 190/190L?

A5: Yes, they can. The courses are not truly equivalent, since some material in the normal 111/112 sequence will be covered quickly as a review, rather than in depth. We need to leave open the possibility for a student who gets a D in this course to be able to go back to the normal sequence; they would need a better level of understanding to be successful in the next courses. These courses are not duplicates of Chem 111 and Chem 112 (or Hons 191/Hons 294) because of the reduced time in lab and also because of the reduced amount of time that can be devoted to each topic. It is highly unlikely that a student who does well in Hons 190 would want to go back and re-take Chem 111 or Chem 112, but if they wanted to, they could.

Q6: Prior practice for current HONS sequence (191/192/293/294) is for students to decline AP credit. Will this practice continue?

A6: No, students will be advised to accept any AP credit for Chem 111 and Chem 112, if applicable. Since HONS 190 is not being coded as equivalent to these two courses, a student can always decide later if they need to go back and take the slower paced Chem 111/Chem 112 courses. At that point, they can either decline the AP credit or request to repeat a course, whichever practice is currently preferred by the registrar's office.
FACULTY CURRICULUM COMMITTEE
COURSE FORM

Instructions:
• Please fill out one of these forms for each course you are adding, changing, deactivating, or reactivating.
• Fill out the parts of the form specified in part B. **You must do this before your request can move forward!**
• Remember that your changes will not be implemented until the next catalog year at the earliest.
• If you have questions, start by checking the instructions on the website. Please feel free to contact the committee chairs with any remaining questions you might have.

A. CONTACT/COURSE INFORMATION.

Name: Pamela Riggs-Gelasco
Phone: 953-5587
Email: gelascop@cofc.edu

Department or Program: Chemistry and Biochemistry
School: School of Science and Math/Honors

Subject Acronym and Course Number: HONS 190 (see separate New Course form for HONS 190L)

Catalog Year in which changes will take effect: FALL 2016

B. TYPE OF REQUEST. Please check all that apply, then fill out the specified parts of the form.

☒ Add a New Course (complete parts C, D, F, G, H, I, J)
☐ Change Part of an Existing Course (complete parts C, D, E, F, G, I, J)
  ☐ Course Number (you must submit a course deactivation request for the old course number)
  ☐ Course Name
  ☐ Course Description
  ☐ Credit/Contact Hours
  ☐ Restrictions (prerequisites, co-requisites, junior/senior standing, etc.)
☐ Deactivate an Existing Course (complete parts C, D, E, G, I, J)
☐ Reactivate a Previously-Deactivated Course (complete parts C, D, E, G, I, J)

C. RATIONALE AND EXPLANATION. Please describe your request and explain why you are making it.

We are requesting the creation of a 5-credit accelerated general chemistry course for Honors students covering a year’s worth of curriculum in one semester.

In Fall 2011, the Department of Chemistry and Biochemistry expanded its Honors Chemistry sequence from a traditional year-long general chemistry sequence to a four semester 1-2-1 sequence. 1-2-1 refers to a non-traditional sequence of one semester of general chemistry, followed by two semesters of organic chemistry, and a final semester of general chemistry. Our HONS 191/HONS 192/HONS 293/HONS 294 sequence has seen its first graduates and the early exposure to organic chemistry has had the desired effect of getting talented students invested into the core curriculum of chemistry (organic and beyond) earlier. Honors students in the new sequence perform better in organic chemistry than do honors students in the traditional 2-2-2 sequence of courses (Chem 111/Chem 112/Chem 231/Chem 232). One drawback of the new sequence is that Honors students cannot take another key course in the curriculum, Chem 220, until their junior year (Chem 112 or HONS 294 is a pre-requisite). This then delays their ability to take Physical Chemistry as well, since Physical Chemistry has a Chem 220 pre-requisite. Another development since 2011 is that the MCAT has been modified to include topics in biochemistry; to be fully prepared for the MCAT biochemistry coverage, CofC students should be taking the full year of biochemistry (which requires a full year of organic as a pre-requisite). Another issue with the new sequence is that there is substantial student attrition by HONS 294. Some of this is due to students deciding to not be a science major, but many of the Honors students are simply going back to take Chem 112 instead of the equivalent (at least in topic coverage) HONS 294. It is difficult for us to

This form was last updated on 12/13/13 and replaces all others.

Page 1 of 6
continue justifying offering HONS 294 and HONS 294L to under a dozen students when Chem 112 lectures and labs are oversubscribed.

Because of the rigors of organic chemistry and because this challenging course is now occurring in freshmen year, the Honors College has been placing only highly qualified students into the Honors chemistry sequence. Students typically have to be enrolled in calculus or beyond, have two years of high school chemistry and/or AP credit for chemistry (which they decline to enroll in the sequence). The students in HONS 191 perform at a very high level, as evidenced by standardized exam scores used in both Chem 111 and HONS 191. The average score for Chem 111 students on the ACS (American Chemical Society) standardized exam is 43/70 (52nd percentile) whereas the HONS 191 students score in the 90th percentile nationwide. To give you an idea of the caliber of students selected to participate, both of the College’s prestigious Goldwater Scholarship recipients were graduates of our 1-2-1 sequence and opted to become biochemistry/chemistry majors BECAUSE of this sequence.

We propose to replace HONS 191/191L and HONS 294/294L with a single 5-credit course, HONS 190 (4) -HONS 190L (1). Instead of a 1-2-1 sequence, these very capable Honors students will be taking an accelerated general chemistry course that covers most of the material traditionally covered in Chem 111/Chem 112, in a single 5-credit lecture/lab combination spanning one semester. We call the new Honors sequence “Super 1-2”. Such accelerated, condensed general chemistry courses are common at other universities for elite students and in fact used to be offered at CoFC twenty-plus years ago. We feel that the Honors students are of sufficiently high caliber and the Honors program is sufficiently diligent with placement to make this a true Honors course, one that eliminates the slow monotonous repetition of high school chemistry most of these students have already mastered.

We feel that this sequence will better meet the needs of our honors majors (and biology honors majors, if they happen to take the Honors Chemistry instead of Honors Biology). The following advantages emerge with this new design:

- Students can take Chem 220 earlier, even as early as 2nd semester freshmen year or in the summer after freshmen year. This is a key course for the major and the minor.
- Honors students can start biochemistry in the second semester of their sophomore year. This earlier start to biochemistry will help honors students complete the year sequence of biochemistry before taking the MCAT.
- Honors students will be more likely to participate in the department’s upper-level electives by finishing required courses earlier.
- It could facilitate early degree completions.
- The new course eliminates the need for Chem 294/294L, which has been offered to a very small number of students because of attrition throughout the four-semester sequence. This adds back teaching capacity to the department.
- An unintended consequence of 1-2-1 was that it slowed the honors student’s progression through our curriculum. The new course (and sequence) allows us to accelerate their progression through the curriculum.

The Super 1-2 option creates a true Honors course, one that requires substantial preparation in high school and that covers material at a deeper level and at a more rapid pace. Prior to 2011, the Honors chemistry sequence (153-154) was simply a regular chemistry course that happened to be taught to Honors students. With the progression to 1-2-1, we have provided more challenge to the Honors students, but the courses are still very traditional and in fact map quite well onto the normal Chem 111/Chem 112/ Chem 231/ Chem 232 courses. This hopefully last version will get it all correct—provide a challenging sequence worthy of the HONORS acronym AND a sequence that opens up curricular options for these best students instead of closing down options. We have for the past two years asked the Honors students enrolled in HONS 191 if they would have liked this option and they have been very enthusiastic about the idea.

The only potential drawback to the new sequence is the 5-credits. We feel 4 lecture periods per week will be required to capture all of the material in HONS 191/HONS 294 at a sufficient level of detail to prepare students for the rigors of organic chemistry, Chem 220 and other upper level courses. While many of these students come with AP credit in hand, we always recommend students take the general chemistry sequence prior to launching into organic chemistry. It is the rare, rare student who can handle organic at the College with only high school preparation in general chemistry.

This form was last updated on 12/13/13 and replaces all others.
The students will be losing one semester of lab credit, but fortunately, general chemistry lab credits are not tabulated by our accrediting agency, the American Chemical Society. Given that Honors students participate in chemistry research usually for two full years, we are not concerned with the loss of a single credit hour of lab at the lower level.

D. IMPACT ON EXISTING PROGRAMS AND COURSES. Please briefly describe the impact of your request on your own programs and courses as well other programs and courses. If another program requires the course, you must submit their written acknowledgement with this proposal. Also, the affected program must describe any change in the number of credit hours they require. Include a list of similar courses in other departments and explain any overlap.

Biology honors students are often in the chemistry honors sequence instead of the biology honors sequence. This depends on many factors, the primary one being that Honors science students can only enroll in one Honors science sequence (Physics, Chemistry or Biology). Since enrollment is sometimes problematic in Honors biology, many biology majors end up taking Honors Chemistry instead (most students are undeclared at this point). The current chemistry requirement for a BS major in Biology is Chem 111/Chem 112/Chem 231/Chem 232. For Honors Biology majors, the chemistry requirement is sometimes met by completing Hons 191/Hons 192/Hons 293/ Hons 294. The new course also allows honors biology majors to finish their chemistry more quickly. For those majors completing the new sequence, they will have 3 fewer credits in Chemistry when they graduate. This could be problematic for biology students who intend to enroll in graduate programs that count the number of chemistry courses taken, rather than look at the content of those courses. Such students might need to supplement their chemistry with an additional course, with a logical option being biochemistry.

Another consideration is how to tally science general education courses for students in this sequence. The vast majority of students in this sequence will likely be taking biology, physics and more chemistry courses, so there are any number of possible sequences that fulfill general education in the sciences. We would request that HONS 190 plus HONS 192 count for general education in the natural sciences (this would replace the current HONS 191-HONS 192 general education sequence). The main complication arises if a student completed HONS 190, but then chose not to pursue more science; they will have completed two courses worth of lecture material in the natural sciences, but only one lab course. Many of these students may already have AP credit for courses Chem 111/111L and Chem 112/112L which can serve as their Gen Ed sequence. If they only received AP credit for Chem 111 (an AP score of 3), that student could pursue a different natural science or take Chem 112/112L. We will be requesting that HONS 190-Chem 112 replace the current HONS 191-Chem 112.

This form was last updated on 12/13/13 and replaces all others.
EXISTING COURSE INFORMATION. If you are proposing a new course, just leave this blank. Otherwise, please fill out all fields.

Department: Chemistry    School: SSM    Subject Acronym: HONS    Course Number: 190

Credit hours:  _ lecture _ lab _ seminar _ independent study
Contact hours:  _ lecture _ lab _ seminar _ independent study

Course title:

Course description (maximum 50 words, exactly as it appears in the catalog):

Restrictions (pre-requisites, co-requisites, majors only, etc.):

Cross-listing, if any:

Is this course repeatable? ☐ yes ☐ no If yes, how many total credit hours may the student earn? _____

E. NEW COURSE INFORMATION. If you are deactivating a course, leave this blank. Otherwise, please fill out all fields. For changed courses, use boldface for the information that is changing.

Department:  
School:  
Subject Acronym:  
Course Number:  

Credit hours:  _ lecture _ lab _ seminar _ independent study
Contact hours:  _ lecture _ lab _ seminar _ independent study

Course title: Accelerated General Chemistry

Course description (maximum 50 words, exactly as it appears in the catalog):

This course covers the content of a typical one-year sequence of general chemistry in a single semester. Topics include stoichiometry, thermodynamics, quantum chemistry introduction, structure and bonding, gas laws, kinetics, redox chemistry and equilibrium. Only students with substantial high school chemistry will be admitted to the course.

Restrictions (pre-requisites, co-requisites, majors only, etc.): Co-requisite: HONS 190L; MATH 120 or placement into MATH 111 or higher; Honors College Admission
Pre-requisite: AP credit in chemistry and/or placement

If this is a newly-created course, is it intended to be the equivalent of an existing course? ☒ yes ☐ no
If so, which course? This single course and the lab will replace HONS 191/191L and HONS 294/294L

If equivalent, will the newly-created course replace the existing course? ☒ yes ☐ no
Note: If yes, you must deactivate that course by submitting an additional Course Form.

Note: This is by my definition of equivalent, meaning that when the students finish this course they will be at the same level as a student who has completed Chem 111 and Chem 112 or the former HONS 191 and HONS 294 courses. However, the course 190 will not be an equivalent experience to Chem 111 and Chem 112 or the HONS 191 and HONS 294 courses because of the difference in lab hours, so they cannot be considered true equivalents. I am not sure what your definition of equivalent is. We are inactivating HONS 191 and HONS 294.
Cross-listing, if any (submit approval from relevant department): 

Note: Cross-listed courses are equivalent.

Is this course repeatable? [ ] yes [x] no  If yes, how many total credit hours may the student earn? ___

Is there an activity, lab, or other fee associated with this course? [ ] yes [x] no  What is the fee?

Note: The Senate cannot approve new fees; Business Affairs will submit any such request to the Board of Trustees. The course can still be created, but the fee will not be attached until the Board has approved it.

F. COSTS. List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.

Cost savings include the net elimination of a course and a lab that was being offered to as few as 10 students in the past (HONS 294/294L)

H. STUDENT LEARNING OUTCOMES AND ASSESSMENT.

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>Students are assessed with a standardized final exam written by the American Chemical Society as their final exam. We expect students to score in the 75th percentile on average.</td>
</tr>
<tr>
<td>1. Apply common mathematical techniques in the solving of chemistry problems such as stoichiometry, gas laws, thermodynamics and kinetics.</td>
<td></td>
</tr>
<tr>
<td>2. Distinguish, classify and explain the properties of compounds</td>
<td>Students are assessed with a standardized final exam written by the American Chemical Society as their final exam. We expect students to score in the 75th percentile on average.</td>
</tr>
<tr>
<td>3. Recognize and explain the fundamental nature of chemical reactivity</td>
<td>Students are assessed with a standardized final exam written by the American Chemical Society as their final exam. We expect students to score in the 75th percentile on average.</td>
</tr>
<tr>
<td>4. Understand the connection between bonding theories and molecular structure</td>
<td>Students are assessed with a standardized final exam written by the American Chemical Society as their final exam. We expect students to score in the 75th percentile on average.</td>
</tr>
</tbody>
</table>

This form was last updated on 12/13/13 and replaces all others.
How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

Program Goal: BS Chemistry and Biochemistry majors and BA Chemistry majors will demonstrate proficiency in the broad discipline of Chemistry and develop the capacity for critical thinking. (I)

Program Goal: BS Chemistry and Biochemistry majors and BA Chemistry majors will demonstrate proficiency in one or more of the more narrowly defined sub-disciplines of Chemistry. (I)

Gen Ed: The course will be designed to contribute to both learning outcomes in the natural sciences general education courses.

I. PROGRAM CHANGES. Will this course be added to the existing degree requirements or list of approved electives of a major, minor, or concentration? ☒ yes ☐ no

If yes, please attach a Change Minor and/or Change Major/Program Form as appropriate.

J. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☒ (For new courses only) I have attached a syllabus.

☒ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☒ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.
FACULTY CURRICULUM COMMITTEE
COURSE FORM

Instructions:
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- Fill out the parts of the form specified in part B. You must do this before your request can move forward!
- Remember that your changes will not be implemented until the next catalog year at the earliest.
- If you have questions, start by checking the instructions on the website. Please feel free to contact the committee chairs with any remaining questions you might have.

A. CONTACT/COURSE INFORMATION.

Name: Pamela Riggs-Gelasco Phone: 953-5587 Email: gelascop@cofc.edu

Department or Program: Chemistry and Biochemistry School: School of Science and Math/Honors

Subject Acronym and Course Number: HONS 190L (see separate New Course form for HONS 190)

Catalog Year in which changes will take effect: FALL 2016

B. TYPE OF REQUEST. Please check all that apply, then fill out the specified parts of the form.

☒ Add a New Course (complete parts C, D, F, G, H, I, J)
☐ Change Part of an Existing Course (complete parts C, D, E, F, G, I, J)
☐ Course Number (you must submit a course deactivation request for the old course number)
☐ Course Name
☐ Course Description
☐ Credit/Contact Hours
☐ Restrictions (prerequisites, co-requisites, junior/senior standing, etc.)
☐ Deactivate an Existing Course (complete parts C, D, E, G, I, J)
☐ Reactivate a Previously-Deactivated Course (complete parts C, D, E, G, I, J)

C. RATIONALE AND EXPLANATION. Please describe your request and explain why you are making it.

We are requesting the creation of a 5-credit accelerated general chemistry course for Honors students covering a year's worth of curriculum in one semester.

In Fall 2011, the Department of Chemistry and Biochemistry expanded its Honors Chemistry sequence from a traditional year-long general chemistry sequence to a four semester 1-2-1 sequence. 1-2-1 refers to a non-traditional sequence of one semester of general chemistry, followed by two semesters of organic chemistry, and a final semester of general chemistry. Our HONS 191/HONS 192/HONS 293/ HONS 294 sequence has seen its first graduates and the early exposure to organic chemistry has had the desired effect of getting talented students invested into the core curriculum of chemistry (organic and beyond) earlier. Honors students in the new sequence perform better in organic chemistry than do honors students in the traditional 2-2 sequence of courses (Chem 111/Chem 112/ Chem 231/ Chem 232). One drawback of the new sequence is that Honors students cannot take another key course in the curriculum, Chem 220, until their junior year (Chem 112 or HONS 294 is a pre-requisite). This then delays their ability to take Physical Chemistry as well, since Physical Chemistry has a Chem 220 pre-requisite. Another development since 2011 is that the MCAT has been modified to include topics in biochemistry; to be fully prepared for the MCAT biochemistry coverage, CoFC students should be taking the full year of biochemistry (which requires a full year of organic as a pre-requisite). Another issue with the new sequence is that there is substantial student attrition by HONS 294. Some of this is due to students deciding to not be a science major, but many of the Honors students are simply going back to take Chem 112 instead of the equivalent (at least in topic coverage) HONS 294. It is difficult for us to
continue justifying offering HONS 294 and HONS 294L to under a dozen students when Chem 112 lectures and labs are oversubscribed.

Because of the rigor of organic chemistry and because this challenging course is now occurring in freshmen year, the Honors College has been placing only highly qualified students into the Honors chemistry sequence. Students typically have to be enrolled in calculus or beyond, have two years of high school chemistry and/or AP credit for chemistry (which they decline to enroll in the sequence). The students in HONS 191 perform at a very high level, as evidenced by standardized exam scores used in both Chem 111 and HONS 191. The average score for Chem 111 students on the ACS (American Chemical Society) standardized exam is 43/70 (52nd percentile) whereas the HONS 191 students score in the 90th percentile nationwide. To give you an idea of the caliber of students selected to participate, both of the College’s prestigious Goldwater Scholarship recipients were graduates of our 1-2-1 sequence and opted to become biochemistry/chemistry majors because of this sequence.

We propose to replace HONS 191/191L and HONS 294/294L with a single 5-credit course, HONS 190 (4)-HONS 190L (1). Instead of a 1-2-1 sequence, these very capable Honors students will be taking an accelerated general chemistry course that covers most of the material traditionally covered in Chem 111/Chem 112, in a single 5-credit lecture/lab combination spanning one semester. We call the new Honors sequence “Super 1-2”. Such accelerated, condensed general chemistry courses are common at other universities for elite students and in fact used to be offered at CofC twenty-plus years ago. We feel that the Honors students are of sufficiently high caliber and the Honors program is sufficiently diligent with placement to make this a true Honors course, one that eliminates the slow monotonous repetition of high school chemistry most of these students have already mastered.

We feel that this sequence will better meet the needs of our honors majors (and biology honors majors, if they happen to take the Honors Chemistry instead of Honors Biology). The following advantages emerge with this new design:

- Students can take Chem 220 earlier, even as early as 2nd semester freshmen year or in the summer after freshmen year. This is a key course for the major and the minor.
- Honors students can start biochemistry in the second semester of their sophomore year. This earlier start to biochemistry will help honors students complete the year sequence of biochemistry before taking the MCAT.
- Honors students will be more likely to participate in the department’s upper-level electives by finishing required courses earlier.
- It could facilitate early degree completions.
- The new course eliminates the need for Chem 294/294L, which has been offered to a very small number of students because of attrition throughout the four-semester sequence. This adds back teaching capacity to the department.
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The Super 1-2 option creates a true Honors course, one that requires substantial preparation in high school and that covers material at a deeper level and at a more rapid pace. Prior to 2011, the Honors chemistry sequence (153-154) was simply a regular chemistry course that happened to be taught to Honors students. With the progression to 1-2-1, we have provided more challenge to the Honors students, but the courses are still very traditional and in fact map quite well onto the normal Chem 111/Chem 112/ Chem 231/ Chem 232 courses. This hopefully last version will get it all correct—provide a challenging sequence worthy of the HONORS acronym AND a sequence that opens up curricular options for these best students instead of closing them down options. We have for the past two years asked the Honors students enrolled in HONS 191 if they would have liked this option and they have been very enthusiastic about the idea.

The only potential drawback to the new sequence is the 5-credits. We feel 4 lecture periods per week will be required to capture all of the material in HONS 191/HONS 294 at a sufficient level of detail to prepare students for the rigors of organic chemistry, Chem 220 and other upper level courses. While many of these students come with AP credit in hand, we always recommend students take the general chemistry sequence prior to launching into organic chemistry. It is the rare, rare student who can handle organic at the College with only high school preparation in general chemistry.

This form was last updated on 12/13/13 and replaces all others.
The students will be losing one semester of lab credit, but fortunately, general chemistry lab credits are not tabulated by our accrediting agency, the American Chemical Society. Given that Honors students participate in chemistry research usually for two full years, we are not concerned with the loss of a single credit hour of lab at the lower level.

D. IMPACT ON EXISTING PROGRAMS AND COURSES. Please briefly describe the impact of your request on your own programs and courses as well other programs and courses. If another program requires the course, you must submit their written acknowledgement with this proposal. Also, the affected program must describe any change in the number of credit hours they require. Include a list of similar courses in other departments and explain any overlap.

Biology honors students are often in the chemistry honors sequence instead of the biology honors sequence. This depends on many factors, the primary one being that Honors science students can only enroll in one Honors science sequence (Physics, Chemistry or Biology). Since enrollment is sometimes problematic in Honors biology, many biology majors end up taking Honors Chemistry instead (most students are undeclared at this point). The current chemistry requirement for a BS major in Biology is Chem 111/Chem 112/ Chem 231/Chem 232. For Honors Biology majors, the chemistry requirement is sometimes met by completing Hons 191/Hons 192/Hons 293/ Hons 294. The new course also allows honors biology majors to finish their chemistry more quickly. For those majors completing the new sequence, they will have 3 fewer credits in Chemistry when they graduate. This could be problematic for biology students who intend to enroll in graduate programs that count the number of chemistry courses taken, rather than look at the content of those courses. Such students might need to supplement their chemistry with an additional course, with a logical option being biochemistry.

Another consideration is how to tally science general education courses for students in this sequence. The vast majority of students in this sequence will likely be taking biology, physics and more chemistry courses, so there are any number of possible sequences that fulfill general education in the sciences. We would request that HONS 190 plus HONS 192 count for general education in the natural sciences (this would replace the current HONS 191-HONS 192 general education sequence). The main complication arises if a student completed HONS 190, but then chose not to pursue more science; they will have completed two courses worth of lecture material in the natural sciences, but only one lab course. For such students, we would recommend that they accept whatever advanced placement credit they received (usually Chem 111 and Chem 112 for a score of 4 or 5 on the AP test) so that their science general education is fulfilled. If they only received AP credit for Chem 111 (an AP score of 3), that student could pursue a different natural science or petition for Chem 111 (AP credit) plus HONS 190 to count for their general education. Alternatively, we could request that Chem 111 (AP credit) + HONS 190 be considered a valid general education sequence in the natural sciences.

A couple of Geology courses (Geol 291 and Geol 250) require Chem 111 and these should be modified to indicate Chem 111 or HONS 190. The major in Geology indicates Chem 111 and Chem 112 OR Chem 111 and Geol 250. This should be modified to indicate Chem 111 and Chem 112, OR Chem 111 and Geol 250, OR HONS 190 and Geol 250.

Exercise Science majors can take the Chem 111-Chem 112 sequence for their choice of science cognates in that major. It is unlikely that an Exercise Science major would take Honors chemistry, but if they did, they likely would have AP credit for Chem 111 and Chem 112 anyway. Exercise Science would like to handle this case-by-case, since they can't recall any of their majors taking Honors Chemistry.
EXISTING COURSE INFORMATION. If you are proposing a new course, just leave this blank. Otherwise, please fill out all fields.

Department: Chemistry  
School: SSM  
Subject Acronym: HONS  
Course Number: 190

Credit hours: __ lecture ___ lab ___ seminar ___ independent study
Contact hours: ___ lecture ___ lab ___ seminar ___ independent study

Course title: Accelerated General Chemistry Lab

Course description (maximum 50 words, exactly as it appears in the catalog):
This course covers the content of a typical one-year sequence of general chemistry in a single semester. Topics include stoichiometry, thermodynamics, quantum chemistry introduction, structure and bonding, gas laws, kinetics, redox chemistry and equilibrium. Only students with substantial high school chemistry will be admitted to the course.

Restrictions (pre-requisites, co-requisites, majors only, etc.): Co-requisite: HONS 190; MATH 111 or placement into MATH 120 or higher; Honors College Admission
Pre-requisite: AP credit in chemistry and/or placement

If this is a newly-created course, is it intended to be the equivalent of an existing course? ☒ yes ☐ no
If so, which course? This single course (HONS 190/191L) will replace HONS 191/191L and HONS 294/294L

E. NEW COURSE INFORMATION. If you are deactivating a course, leave this blank. Otherwise, please fill out all fields. For changed courses, use boldface for the information that is changing.

Department:  
School:  
Subject Acronym:  
Course Number:  

Credit hours: ___ lecture ___ lab ___ seminar ___ independent study
Contact hours: ___ hours/week lab

Course title:  

Course description (maximum 50 words, exactly as it appears in the catalog):

Note: This is by my definition of equivalent, meaning that when the students finish this course they will be at the same level as a student who has completed Chem 111 and Chem 112 or the former HONS 191 and HONS 294 courses. However, the course 190 will not be an equivalent experience to Chem 111 and Chem 112 or the HONS 191 and HONS 294 courses because of the difference in lab hours, so they cannot be considered true equivalents. I am not sure what your definition of equivalent is. We are inactivating HONS 191 and HONS 294.

If equivalent, will the newly-created course replace the existing course? ☒ yes ☐ no

Note: If yes, you must deactivate that course by submitting an additional Course Form.
Cross-listing, if any (submit approval from relevant department): __________________
Note: Cross-listed courses are equivalent.

Is this course repeatable? □ yes ☒ no If yes, how many total credit hours may the student earn? ____

Is there an activity, lab, or other fee associated with this course? ☒ yes □ no What is the fee? $125 (standard Chemistry lab fee—not a new fee)

Note: The Senate cannot approve new fees; Business Affairs will submit any such request to the Board of Trustees. The course can still be created, but the fee will not be attached until the Board has approved it.

F. COSTS. List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.

Cost savings include the net elimination of a course and a lab that was being offered to as few as 10 students in the past (HONS 294/294L)

H. STUDENT LEARNING OUTCOMES AND ASSESSMENT.

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. Develop an understanding of the scientific method in a chemistry laboratory setting</td>
<td>Students are assessed in a lab practical final exam.</td>
</tr>
<tr>
<td>2. Practice and illustrate the application of mathematical manipulations of integrated chemical principles.</td>
<td>Students are assessed using a final exam with targeted questions to assess mathematical manipulations.</td>
</tr>
<tr>
<td>3. Interpret scientific data</td>
<td>Students are assessed with a final paper written in a journal article format.</td>
</tr>
</tbody>
</table>

This form was last updated on 12/13/13 and replaces all others.
How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

Program Goal: BS Chemistry and Biochemistry majors and BA Chemistry majors will demonstrate proficiency in the broad discipline of Chemistry and develop the capacity for critical thinking. (I)

Program Goal: BS Chemistry and Biochemistry majors and BA Chemistry majors will demonstrate proficiency in one or more of the more narrowly defined sub-disciplines of Chemistry. (I)

Gen Ed: The course will be designed to contribute to both learning outcomes in the natural sciences general education courses.

I. PROGRAM CHANGES. Will this course be added to the existing degree requirements or list of approved electives of a major, minor, or concentration? ☒ yes ☐ no

If yes, please attach a Change Minor and/or Change Major/Program Form as appropriate.

J. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☒ (For new courses only) I have attached a syllabus.

☒ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☒ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.

This form was last updated on 12/13/13 and replaces all others.
FACULTY CURRICULUM COMMITTEE
CHANGE/DELETE PROGRAM FORM

Instructions:
- Please fill out all of the portions of the form that are specified in section B. You must do this before your request can move forward!
- Remember that your changes will not be implemented until the next catalog year at the earliest.
- If you have questions, please start by checking the detailed instructions on the website.
- Please feel free to contact the committee chair with any remaining questions you might have.

A. CONTACT INFORMATION.
Name: Pamela Riggs-Gelasco Phone: 3-5587 Email: gelascop@cofc.edu
Name: Pamela Riggs-Gelasco Phone: 3-5587 Email: gelascop@cofc.edu
School: SSM Department or Program: Chemistry
Name and Acronym of Major: CHEM-BS

B. CATEGORY OF REVIEW. Please check all that apply, then fill out the specified parts of the form.

☐ Change Request (fill out all sections)
☒ Add an existing course to requirements or electives
☐ Add a new course to requirements or electives (attach completed course form for each)
☒ Delete courses from requirements or electives
☐ Add or modify concentration*
☐ Add or modify cognate*

*Note: Only concentrations and cognates requiring 18 or more credit hours will be tracked in Banner and Degree Works and noted on the transcript.

☐ Terminate Program (fill out E, G, H, and I)
☐ Terminate degree
☐ Terminate major
☐ Terminate concentration
☐ Terminate cognate

C. GENERAL INFORMATION
Number of Current Credit Hours (for existing program): 72+
Number of Proposed Credit Hours (for changed program): 69+ (for Honors students only)
Catalog Year in which changes will take effect: FALL 2016

D. CURRICULUM. Please list every change you are making below AND attach the current Program of Study Worksheet for this major (http://registrar.cofc.edu/program-of-study-resources/program-of-study-worksheets/index.php) with changes marked in RED. Additions should show where the course will be inserted, deletions should be noted by crossing out the course, and moves indicated with arrows. Distinguish between required and elective courses, and note any prerequisites, co-requisites, sequencing, or other restrictions. Provide the catalog description and course list exactly as they should appear in the catalog. For each new course, submit the Curriculum Committee's Course Form and a sample syllabus.

Chem 111
Chem 111L

This form was last updated on 6/6/2013 and replaces all others.
E. RATIONALE AND EXPLANATION. Please provide a narrative addressing the request you are making and why you are making it.

In Fall 2011, the Department of Chemistry and Biochemistry expanded its Honors Chemistry sequence from a traditional year-long general chemistry sequence to a four semester 1-2-1 sequence. 1-2-1 refers to a non-traditional sequence of one semester of general chemistry, followed by two semesters of organic chemistry, and a final semester of general chemistry. Our HONS 191/HONS 192/HONS 293/ HONS 294 sequence has seen its first graduates and the early exposure to organic chemistry has had the desired effect of getting talented students invested into the core curriculum of chemistry (organic and beyond) earlier. Honors students in the new sequence perform better in organic chemistry than do honors students in the traditional 2-2 sequence of courses (Chem 111/Chem 112/ Chem 231/ Chem 232). One drawback of the new sequence is that Honors students cannot take another key course in the curriculum, Chem 220, until their junior year (Chem 112 or HONS 294 is a pre-requisite). This then delays their ability to take Physical Chemistry as well, since Physical Chemistry has a Chem 220 pre-requisite. Another development since 2011 is that the MCAT has been modified to include topics in biochemistry; to be fully prepared for the MCAT biochemistry coverage, CoC students should be taking the full year of biochemistry (which requires a full year of organic as a pre-requisite). Another issue with the new sequence is that there is substantial student attrition by HONS 294. Some of this is due to students deciding to not be a science major, but many of the Honors students are simply going back to take Chem 112 instead of the equivalent (at least in topic coverage) HONS 294. It is difficult for us to continue justifying offering HONS 294 and HONS 294L to under a dozen students when Chem 112 lectures and labs are oversubscribed.

Because of the rigors of organic chemistry and because this challenging course is now occurring in freshmen year, the Honors College has been placing only highly qualified students into the Honors chemistry sequence. Students typically have to be enrolled in calculus or beyond, have two years of high school chemistry and/or AP credit for chemistry (which they decline to enroll in the sequence). The students in HONS 191 perform at a very high level, as evidenced by standardized exam scores used in both Chem 111 and HONS 191. The average score for Chem 111 students on the ACS (American Chemical Society) standardized exam is 43/70 (52nd percentile) whereas the HONS 191 students score in the 90th percentile nationwide. To give you an idea of the caliber of students selected to participate, both of the College's prestigious Goldwater Scholarship recipients were graduates of our 1-2-1 sequence and opted to become biochemistry/chemistry majors BECAUSE of this sequence.

We propose to replace HONS 191/191L and HONS 294/294L with a single 5-credit course, HONS 190 (4) -HONS 190L (1). Instead of a 1-2-1 sequence, these very capable Honors students will be taking an accelerated general chemistry course that covers most of the material traditionally covered in Chem 111/Chem 112, in a single 5-credit lecture/lab combination spanning one semester. We call the new Honors sequence “Super 1-2”. Such accelerated, condensed general chemistry courses are common at other universities for elite students. In fact, prior to the existence of the Honors College, the Chemistry Department at CoC did offer an accelerated version of Chem 111/Chem 112 accessible only via chemistry placement exam. When an Honors curriculum was put into place, they preferred a traditional 2-semester sequence. Honors versions of Chem 111 and Chem 112 (HONS 153 and HONS 154) were introduced and the accelerated chemistry course was no longer offered. We feel that the Honors students are of sufficiently high caliber and the Honors program is sufficiently diligent with placement to make this a true Honors course, a course that eliminates the slow monotonous repetititon of high school chemistry. most of these students have already mastered and a course that gives a competitive advantage to those who complete it.
We feel that this sequence will better meet the needs of our honors majors (and biology honors majors, if they happen to take the Honors Chemistry instead of Honors Biology). The following advantages emerge with this new design:

- Students can take Chem 220 earlier, even as early as 2nd semester freshmen year or in the summer after freshmen year. This is a key course for the major and the minor.
- Honors students can start biochemistry in the second semester of their sophomore year. This earlier start to biochemistry will help honors students complete the year sequence of biochemistry before taking the MCAT.
- Honors students will be more likely to participate in the department’s upper-level elective courses by finishing required courses earlier.
- Earlier completion of the core courses will facilitate early start in research.
- The course enables early degree completions.
- The new course eliminates the need for Chem 294/294L, which has been offered to a very small number of students because of attrition throughout the four-semester Honors sequence. This adds back teaching capacity to the department.
- An unintended consequence of 1-2-1 was that it slowed the honors student’s progression through our curriculum. The new course (and sequence) allows us to accelerate their progression through the curriculum.

The Super 1-2 option creates a true Honors course, one that requires substantial preparation in high school and that covers material at a deeper level and at a more rapid pace. Prior to 2011, the Honors chemistry sequence (153-154) was simply a regular chemistry course that happened to be taught to Honors students. With the progression to 1-2-1, we have provided more challenge to the Honors students, but the courses are still very traditional and in fact map quite well onto the normal Chem 111/Chem 112/Chem 231/Chem 232 courses. This hopefully last version will get it all correct—provide a challenging sequence worthy of the HONORS acronym AND a sequence that opens up curricular options for these best students instead of closing down options. We have for the past two years asked the Honors students enrolled in HCNS 191 if they would have liked this option and they have been very enthusiastic about the idea.

The only potential drawback to the new sequence is the 5-credits. We feel 4 lecture periods per week will be required to capture all of the material in HONS 191/HONS 294 at a sufficient level of detail to prepare students for the rigor of organic chemistry, Chem 220 and other upper level courses. While many of these students come with AP credit in hand, we always recommend students take the general chemistry sequence prior to launching into organic chemistry. It is the rare, rare student who can handle organic at the College with only high school preparation in general chemistry. The students will be losing one semester of lab credit, but fortunately, general chemistry lab credits are not tabulated by our accrediting agency, the American Chemical Society. Given that Honors students participate in chemistry research usually for two full years, we are not concerned with the loss of a single credit hour of lab at the lower level. Lastly, since most enrolled students in the new sequence will have AP credit for Chem 111 and Chem 112, they could still accept this credit. If a graduate program in biology, chemistry or a medical school counts chemistry credit hours instead of looking at content covered, these students would still be covered. Likewise, students who withdraw from science after taking the “Super 1” course could still have their general education in natural sciences completed.

**F. STUDENT LEARNING OUTCOMES AND ASSESSMENT.**

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<thead>
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<td></td>
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</tr>
<tr>
<td>1. The BS Chemistry major will demonstrate proficiency in the broader discipline of Chemistry and develop capacity for critical thinking.</td>
<td>How: 1) Educational Testing Service Major Field Test in Chemistry which is administered each spring as part of the required Senior Seminar capstone in the major, CHEM 492. CHEM 492 must be taken the spring semester immediately preceding graduation. 2) Critical thinking subsections of MFT and also ETS test administered by College.</td>
</tr>
<tr>
<td></td>
<td>Who: All majors</td>
</tr>
<tr>
<td></td>
<td>When: Within final year of time at CofC</td>
</tr>
<tr>
<td></td>
<td>How well: We expect that, on average, our students will score at or above the 50% percentile on this instrument in terms of their overall score; we expect Chemistry and Biochemistry majors to perform much higher than average on campus.</td>
</tr>
<tr>
<td>2. The BS Chemistry major will demonstrate proficiency in one or more of the more narrowly defined sub-disciplines of Chemistry, which include Analytical, Biochemistry, Inorganic, Organic, or Physical chemistry.</td>
<td>How: 1) Educational Testing Service Major Field Test in Chemistry which is administered each spring as part of the required Senior Seminar capstone in the major, CHEM 492. 2) ACS exams in biochemistry, physical chemistry, and organic chemistry.</td>
</tr>
<tr>
<td></td>
<td>When: CHEM 492 must be taken the spring semester immediately preceding graduation; ACS exams are taken in the 2nd, 3rd, and 4th years of curriculum.</td>
</tr>
<tr>
<td></td>
<td>How Well: We expect that, on average, our students will score at or above the 60% percentile on this instrument in terms of their score on at least one of the sub-disciplinary test areas. While the test does not have a biochemistry section, it does filter out and provide a score for the smaller number of biochemistry related questions. 2) We expect students to perform at the 60th percentile nationwide on average.</td>
</tr>
<tr>
<td></td>
<td>Who: all majors; all students taking the course</td>
</tr>
<tr>
<td>3. The BS Chemistry major will demonstrate a positive appreciation for the educational experiences received within our department.</td>
<td>How: 1) Senior survey administered as part of the CHEM 492 course, response to these questions: “Your experience in the department has served you well in preparation for your anticipated career goals” &amp; “My overall opinion of the Department of Chemistry and Biochemistry is that it is an excellent department”; 2) senior survey administered by the College of Charleston should reflect high satisfaction with the major; 3) Alumni surveys as part of T and P.</td>
</tr>
<tr>
<td></td>
<td>Who: All majors; selected graduates</td>
</tr>
</tbody>
</table>
4. BS Chemistry majors achieve success in attaining career goals

How: 1) The department will track student career intentions prior to leaving campus by using required exit surveys, Facebook, and Linked In. 2) The department will conduct alumni surveys after 3 years.

Who: all majors

When: just prior to graduation and after graduation updates periodically; 3 years after graduation

How well: Our hope is that 75% of students desiring to stay in science will successfully be matriculated in a graduate program or will be successfully employed.

G. IMPACT ON EXISTING PROGRAMS AND COURSES. Please describe the impact of this request on other programs and courses. If you are deleting a program, please describe the effect on all programs that will be impacted. If you are adding or changing a program, please explain any overlap with existing programs at the College.

Biology honors students are often in the chemistry honors sequence instead of the biology honors sequence. This depends on many factors, the primary one being that Honors science students can only enroll in one Honors science sequence (Physics, Chemistry or Biology). Since enrollment is sometimes problematic in Honors biology, many biology majors end up taking Honors Chemistry instead (most students are undeclared at this point). The current chemistry requirement for a BS major in Biology is Chem 111/Chem 112/Chem 231/Chem 232. For Honors Biology majors, the chemistry requirement is sometimes met by completing Hons 191/Hons 192/Hons 293/Hons 294. The new course also allows honors biology majors to finish their chemistry more quickly. For those majors completing the new sequence, they will have 3 fewer credits in Chemistry when they graduate. This could be problematic for biology students who intend to enroll in graduate programs that count the number of chemistry courses taken, rather than look at the content of those courses. Such students might need to supplement their chemistry with an additional course, with a logical option being biochemistry.

Another consideration is how to tally science general education courses for students in this sequence. The vast majority of students in this sequence will likely be taking biology, physics and more chemistry courses, so there are any number of possible sequences that fulfill general education in the sciences. We would request that HONS 190 plus HONS 192 count for general education in the natural sciences (this would replace the current HONS 191/HONS 192 general education sequence). The main complication arises if a student completed HONS 190, but then chose not to pursue more science; they will have completed two courses worth of lecture material in the natural sciences, but only one lab course. Many of these students may already have AP credit for courses Chem 111/111L and Chem 112/112L which can serve as their Gen Ed sequence. If they only received AP credit for Chem 111 (an AP score of 3), that student could pursue a different natural science or take Chem 112/112L. We will be requesting that HONS 190-Chem 112 replace the current HONS 191-Chem 112.

H. COSTS ASSOCIATED WITH THE REQUESTED ACTION. List all of the new costs or cost savings (including new faculty/staff requests, library, or equipment) associated with your request.

This form was last updated on 6/6/2013 and replaces all others.
The proposal reduces adjunct dependency, since the number of Honors courses (always taught by roster faculty) will be lessened by 2 courses (by eliminating HONS 294 and HONS 294L).

J. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☒ (For new courses only) I have attached a syllabus.

☒ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☒ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.
FACULTY CURRICULUM COMMITTEE  
CHANGE/DELETE PROGRAM FORM

Instructions:

- Please fill out all of the portions of the form that are specified in section B. You must do this before your request can move forward!
- Remember that your changes will not be implemented until the next catalog year at the earliest.
- If you have questions, please start by checking the detailed instructions on the website.
- Please feel free to contact the committee chair with any remaining questions you might have.

A. CONTACT INFORMATION.

Name: Pamela Riggs-Gelasco   Phone: 3-5587   Email: gelascop@cofc.edu
School: SSM   Department or Program: Chemistry
Name and Acronym of Major: CHEM-BA

B. CATEGORY OF REVIEW. Please check all that apply, then fill out the specified parts of the form.

☐ Change Request (fill out all sections)
  ☒ Add an existing course to requirements or electives
  ☐ Add a new course to requirements or electives (attach completed course form for each)
  ☒ Delete courses from requirements or electives
  ☐ Add or modify concentration*
  ☐ Add or modify cognate*

*Note: Only concentrations and cognates requiring 18 or more credit hours will be tracked in Banner and Degree Works and noted on the transcript.

☐ Terminate Program (fill out E, G, H, and I)
  ☐ Terminate degree
  ☐ Terminate major
  ☐ Terminate concentration
  ☐ Terminate cognate

C. GENERAL INFORMATION

Number of Current Credit Hours (for existing program): 42+
Number of Proposed Credit Hours (for changed program): 42+ (for Honors students only)
Catalog Year in which changes will take effect: FALL 2016

D. CURRICULUM. Please list every change you are making below AND attach the current Program of Study Worksheet for this major (http://registrar.cofc.edu/program-of-study-resources/program-of-study-worksheets/index.php) with changes marked in RED. Additions should show where the course will be inserted, deletions should be noted by crossing out the course, and moves indicated with arrows. Distinguish between required and elective courses, and note any prerequisites, co-requisites, sequencing, or other restrictions. Provide the catalog description and course list exactly as they should appear in the catalog. For each new course, submit the Curriculum Committee’s Course Form and a sample syllabus.

Chem 111
Chem 111L

This form was last updated on 6/6/2013 and replaces all others.
E. RATIONALE AND EXPLANATION. Please provide a narrative addressing the request you are making and why you are making it.

In Fall 2011, the Department of Chemistry and Biochemistry expanded its Honors Chemistry sequence from a traditional year-long general chemistry sequence to a four semester 1-2-1 sequence. 1-2-1 refers to a non-traditional sequence of one semester of general chemistry, followed by two semesters of organic chemistry, and a final semester of general chemistry. Our HONS 191/HONS 192/HONS 293/HONS 294 sequence has seen its first graduates and the early exposure to organic chemistry has had the desired effect of getting talented students invested into the core curriculum of chemistry (organic and beyond) earlier. Honors students in the new sequence perform better in organic chemistry than do honors students in the traditional 2-2 sequence of courses (Chem 111/Chem 112/Chem 231/Chem 232). One drawback of the new sequence is that Honors students cannot take another key course in the curriculum, Chem 220, until their junior year (Chem 112 or HONS 294 is a pre-requisite). This then delays their ability to take Physical Chemistry as well, since Physical Chemistry has a Chem 220 pre-requisite. Another development since 2011 is that the MCAT has been modified to include topics in biochemistry; to be fully prepared for the MCAT biochemistry coverage, CofC students should be taking the full year of biochemistry (which requires a full year of organic as a pre-requisite). Another issue with the new sequence is that there is substantial student attrition by HONS 294. Some of this is due to students deciding to not be a science major, but many of the Honors students are simply going back to take Chem 112 instead of the equivalent (at least in topic coverage) HONS 294. It is difficult for us to continue justifying offering HONS 294 and HCNS 294L to under a dozen students when Chem 112 lectures and labs are oversubscribed.

Because of the rigors of organic chemistry and because this challenging course is now occurring in freshmen year, the Honors College has been placing only highly qualified students into the Honors chemistry sequence. Students typically have to be enrolled in calculus or beyond, have two years of high school chemistry and/or AP credit for chemistry (which they decline to enroll in the sequence). The students in HONS 191 perform at a very high level, as evidenced by standardized exam scores used in both Chem 111 and HONS 191. The average score for Chem 111 students on the ACS (American Chemical Society) standardized exam is 43/70 (52\textsuperscript{nd} percentile) whereas the HONS 191 students score in the 90\textsuperscript{th} percentile nationwide. To give you an idea of the caliber of students selected to participate, both of the College’s prestigious Goldwater Scholarship recipients were graduates of our 1-2-1 sequence and opted to become biochemistry/chemistry majors BECAUSE of this sequence.

We propose to replace HONS 191/191L and HONS 294/294L with a single 5-credit course, HONS 190 (4) - HONS 190L (1). Instead of a 1-2-1 sequence, these very capable Honors students will be taking an accelerated general chemistry course that covers most of the material traditionally covered in Chem 111/Chem 112, in a single 5-credit lecture/lab combination spanning one semester. We call the new Honors sequence “Super 1-2”

Such accelerated, condensed general chemistry courses are common at other universities for elite students. In fact, prior to the existence of the Honors College, the Chemistry Department at CofC did offer an accelerated version of Chem 111/Chem 112 accessible only via chemistry placement exam. When an Honors curriculum was put into place, they preferred a traditional 2-semester sequence. Honors versions of Chem 111 and Chem 112 (HONS 153 and HONS 154) were introduced and the accelerated chemistry course was no longer offered. We feel that the Honors students are of sufficiently high caliber and the Honors program is sufficiently diligent with placement to make this a true Honors course, a course that eliminates the slow monotonous repetition of high school chemistry most of these students have already mastered and a course that gives a competitive advantage to those who complete it.
We feel that this sequence will better meet the needs of our honors majors (and biology honors majors, if they happen to take the Honors Chemistry instead of Honors Biology). The following advantages emerge with this new design:

- Students can take Chem 220 earlier, even as early as 2nd semester freshmen year or in the summer after freshmen year. This is a key course for the major and the minor.
- Honors students can start biochemistry in the second semester of their sophomore year. This earlier start to biochemistry will help honors students complete the year sequence of biochemistry before taking the MCAT.
- Honors students will be more likely to participate in the department’s upper-level elective courses by finishing required courses earlier.
- Earlier completion of the core courses will facilitate early start in research.
- The course enables early degree completions.
- The new course eliminates the need for Chem 294/294L, which has been offered to a very small number of students because of attrition throughout the four-semester Honors sequence. This adds back teaching capacity to the department.
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The only potential drawback to the new sequence is the 5-credits. We feel 4 lecture periods per week will be required to capture all of the material in HONS 191/HONS 294 at a sufficient level of detail to prepare students for the rigors of organic chemistry, Chem 220 and other upper level courses. While many of these students come with AP credit in hand, we always recommend students take the general chemistry sequence prior to launching into organic chemistry. It is the rare, rare student who can handle organic at the College with only high school preparation in general chemistry. The students will be losing one semester of lab credit, but fortunately, general chemistry lab credits are not tabulated by our accrediting agency, the American Chemical Society. Given that Honors students participate in chemistry research usually for two full years, we are not concerned with the loss of a single credit hour of lab at the lower level. Lastly, since most enrolled students in the new sequence will have AP credit for Chem 111 and Chem 112, they could still accept this credit. If a graduate program in biology, chemistry or a medical school counts chemistry credit hours instead of looking at content covered, these students would still be covered. Likewise, students who withdraw from science after taking the “Super 1” course could still have their general education in natural sciences completed.

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT.

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<td>When: Within final year of time at CofC</td>
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<tr>
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4. BS Chemistry majors achieve success in attaining career goals

4. BS Chemistry majors achieve success in attaining career goals

College of Charleston should reflect high satisfaction with the major; 3) Alumni surveys as part of T and P
Who: All majors; selected graduates
When: Senior year; random survey responses each Fall when a T and P case is conducted that requires alumni input
How well: >70% in College’s exit senior survey in the area of overall academic experience and program of study.
>70% rate strongly agree to questions in our own survey. >70% positive responses to program on alumni surveys

How: 1) The department will track student career intentions prior to leaving campus by using required exit surveys, Facebook, and Linked In. 2) The department will conduct alumni surveys after 3 years.
Who: all majors
When: just prior to graduation and after graduation updates periodically; 3 years after graduation
How well: Our hope is that 75% of students desiring to stay in science will successfully be matriculated in a graduate program or will be successfully employed.

G. IMPACT ON EXISTING PROGRAMS AND COURSES. Please describe the impact of this request on other programs and courses. If you are deleting a program, please describe the effect on all programs that will be impacted; if you are adding or changing a program, please explain any overlap with existing programs at the College.

Biology honors students are often in the chemistry honors sequence instead of the biology honors sequence. This depends on many factors, the primary one being that Honors science students can only enroll in one Honors science sequence (Physics, Chemistry or Biology). Since enrollment is sometimes problematic in Honors biology, many biology majors end up taking Honors Chemistry instead (most students are undeclared at this point). The current chemistry requirement for a BS major in Biology is Chem 111/Chem 112/ Chem 231/Chem 232. For Honors Biology majors, the chemistry requirement is sometimes met by completing Hons 191/Hons 192/Hons 293/ Hons 294. The new course also allows honors biology majors to finish their chemistry more quickly. For those majors completing the new sequence, they will have 3 fewer credits in Chemistry when they graduate. This could be problematic for biology students who intend to enroll in graduate programs that count the number of chemistry courses taken, rather than look at the content of those courses. Such students might need to supplement their chemistry with an additional course, with a logical option being biochemistry.

Another consideration is how to tally science general education courses for students in this sequence. The vast majority of students in this sequence will likely be taking biology, physics and more chemistry courses, so there are any number of possible sequences that fulfill general education in the sciences. We would request that HONS 190 plus HONS 192 count for general education in the natural sciences (this would replace the current HONS 191-HONS 192 general education sequence). The main complication arises if a student completed HONS 190, but then chose not to pursue more science; they will have completed two courses worth of lecture material in the natural sciences, but only one lab course. Many of these students may already have AP credit for courses Chem 111/111L and Chem 112/112L which can serve as their Gen Ed sequence. If they only received AP credit for Chem 111 (an AP score of 3), that student could pursue a different natural science or take Chem 112/112L. We will be requesting that HONS 190-Chem 112 replace the current HONS 191-Chem 112.
H. COSTS ASSOCIATED WITH THE REQUESTED ACTION. List all of the new costs or cost savings (including new faculty/staff requests, library, or equipment) associated with your request.

Cost savings include the net elimination of a course and a lab that was being offered to as few as 10 students in the past (HONS 294/294L)

J. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☒ (For new courses only) I have attached a syllabus.

☒ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☒ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.
FACULTY CURRICULUM COMMITTEE
CHANGE/DELETE PROGRAM FORM

Instructions:
- Please fill out all of the portions of the form that are specified in section B. You must do this before your request can move forward!
- Remember that your changes will not be implemented until the next catalog year at the earliest.
- If you have questions, please start by checking the detailed instructions on the website.
- Please feel free to contact the committee chair with any remaining questions you might have.

A. CONTACT INFORMATION.

Name: Pamela Riggs-Gelasco Phone: 3-5587 Email: gelascop@cofc.edu

School: SSM Department or Program: Chemistry

Name and Acronym of Major: BIOC-BS

B. CATEGORY OF REVIEW. Please check all that apply, then fill out the specified parts of the form.

☐ Change Request (fill out all sections)
☐ Add an existing course to requirements or electives
☒ Add a new course to requirements or electives (attach completed course form for each)
☒ Delete courses from requirements or electives
☐ Add or modify concentration*
☐ Add or modify cognate*

*Note: Only concentrations and cognates requiring 18 or more credit hours will be tracked in Banner and Degree Works and noted on the transcript.

☐ Terminate Program (fill out E, G, H, and I)
☐ Terminate degree
☐ Terminate major
☐ Terminate concentration
☐ Terminate cognate

C. GENERAL INFORMATION

Number of Current Credit Hours (for existing program): 72+
Number of Proposed Credit Hours (for changed program): 69+ (for Honors students only)
Catalog Year in which changes will take effect: FALL 2016

D. CURRICULUM. Please list every change you are making below AND attach the current Program of Study Worksheet for this major (http://registrar.cofc.edu/program-of-study-resources/program-of-study-worksheets/index.php) with changes marked in RED. Additions should show where the course will be inserted, deletions should be noted by crossing out the course, and moves indicated with arrows. Distinguish between required and elective courses, and note any prerequisites, co-requisites, sequencing, or other restrictions. Provide the catalog description and course list exactly as they should appear in the catalog. For each new course, submit the Curriculum Committee’s Course Form and a sample syllabus.

Chem 111
Chem 111L

This form was last updated on 6/6/2013 and replaces all others.
E. RATIONALE AND EXPLANATION. Please provide a narrative addressing the request you are making and why you are making it.

In Fall 2011, the Department of Chemistry and Biochemistry expanded its Honors Chemistry sequence from a traditional year-long general chemistry sequence to a four semester 1-2-1 sequence. 1-2-1 refers to a non-traditional sequence of one semester of general chemistry, followed by two semesters of organic chemistry, and a final semester of general chemistry. Our HONS 191/HONS 192/HONS 293/ HONS 294 sequence has seen its first graduates and the early exposure to organic chemistry has had the desired effect of getting talented students invested into the core curriculum of chemistry (organic and beyond) earlier. Honors students in the new sequence perform better in organic chemistry than do honors students in the traditional 2-2 sequence of courses (Chem 111/Chem 112/ Chem 231/ Chem 232). One drawback of the new sequence is that Honors students cannot take another key course in the curriculum, Chem 220, until their junior year (Chem 112 or HONS 294 is a pre-requisite). This then delays their ability to take Physical Chemistry as well, since Physical Chemistry has a Chem 220 pre-requisite. Another development since 2011 is that the MCAT has been modified to include topics in biochemistry; to be fully prepared for the MCAT biochemistry coverage, CoC students should be taking the full year of biochemistry (which requires a full year of organic as a pre-requisite). Another issue with the new sequence is that there is substantial student attrition by HONS 294. Some of this is due to students deciding to not be a science major, but many of the Honors students are simply going back to take Chem 112 instead of the equivalent (at least in topic coverage) HONS 294. It is difficult for us to continue justifying offering HONS 294 and HONS 294L to under a dozen students when Chem 112 lectures and labs are oversubscribed.

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The Super 1-2 option creates a true Honors course, one that requires substantial preparation in high school and that covers material at a deeper level and at a more rapid pace. Prior to 2011, the Honors chemistry sequence (153-154) was simply a regular chemistry course that happened to be taught to Honors students. With the progression to 1-2-1, we have provided more challenge to the Honors students, but the courses are still very traditional and in fact map quite well onto the normal Chem 111/Chem 112/ Chem 231/ Chem 232 courses. This hopefully last version will get it all correct—provide a challenging sequence worthy of the HONORS acronym AND a sequence that opens up curricular options for these best students instead of closing down options. We have for the past two years asked the Honors students enrolled in HONS 191 if they would have liked this option and they have been very enthusiastic about the idea.

The only potential drawback to the new sequence is the 5-credits. We feel 4 lecture periods per week will be required to capture all of the material in HONS 191/HONS 294 at a sufficient level of detail to prepare students for the rigor of organic chemistry, Chem 220 and other upper level courses. While many of these students come with AP credit in hand, we always recommend students take the general chemistry sequence prior to launching into organic chemistry. It is the rare, rare student who can handle organic at the College with only high school preparation in general chemistry. The students will be losing one semester of lab credit, but fortunately, general chemistry lab credits are not tabulated by our accrediting agency, the American Chemical Society. Given that Honors students participate in chemistry research usually for two full years, we are not concerned with the loss of a single credit hour of lab at the lower level. Lastly, since most enrolled students in the new sequence will have AP credit for Chem 111 and Chem 112, they could still accept this credit. If a graduate program in biology, chemistry or a medical school counts chemistry credit hours instead of looking at content covered, these students would still be covered. Likewise, students who withdraw from science after taking the “Super 1” course could still have their general education in natural sciences completed.

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Who: All majors  
When: Within final year of time at CoC  
How well: We expect that, on average, our students will score at or above the 50% percentile on this instrument in terms of their overall score; we expect Chemistry and Biochemistry majors to perform much higher than average on campus. |
|---|---|
| 2. The BS Biochemistry major will demonstrate proficiency in one or more of the more narrowly defined sub-disciplines of Chemistry, which include Analytical, Biochemistry, Inorganic, Organic, or Physical chemistry. | How: 1) **Educational Testing Service Major Field Test** in Chemistry which is administered each spring as part of the required Senior Seminar capstone in the major, CHEM 492. 2) **ACS exams in biochemistry, physical chemistry, and organic chemistry**  
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How Well: We expect that, on average, our students will score at or above the 60% percentile on this instrument in terms of their score on at least one of the sub-disciplinary test areas. While the test does not have a biochemistry section, it does filter out and provide a score for the smaller number of biochemistry related questions. 2) We expect students to perform at the 60th percentile nationwide on average.  
Who: All majors; all students taking the course |
| 3. The BS Biochemistry major will demonstrate a positive appreciation for the educational experiences received within our department. | How: 1) Senior survey administered as part of the CHEM 492 course, response to these questions: “Your experience in the department has served you well in preparation for your anticipated career goals” & “My overall opinion of the Department of Chemistry and Biochemistry is that it is an excellent department”; 2) senior survey administered by the College of Charleston should reflect high satisfaction with the major; 3) **Alumni surveys as part of T and P**  
Who: All majors; selected graduates  
When: Senior year; random survey responses each Fall when a T and P case is conducted that requires alumni input |
4. BS Biochemistry majors achieve success in attaining career goals

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H. COSTS ASSOCIATED WITH THE REQUESTED ACTION. List all of the new costs or cost savings (including new faculty/staff requests, library, or equipment) associated with your request.

The proposal reduces adjunct dependency, since the number of Honors courses (always taught by roster faculty) will be lessened by 2 courses (by eliminating HONS 294 and HONS 294L).

This form was last updated on 6/6/2013 and replaces all others.
J. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☒ (For new courses only) I have attached a syllabus.

☒ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☒ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.
FACULTY CURRICULUM COMMITTEE
MINOR FORM

Instructions:
• Please fill out all of the portions of the form that are specified in section B. You must do this before your request can move forward!
• Remember that your changes will not be implemented until the next catalog year at the earliest.
• If you have questions, please start by checking the detailed instructions on the website. Please feel free to contact the committee chair with any remaining questions you might have.

A. CONTACT INFORMATION.

Name: Pamela Riggs-Gelasco  Phone: 3-5587  Email: gelascop@cofc.edu
School: SSM  Department or Program: Chemistry (affects honors minors only)
Name and Acronym of Minor: CHEM

B. TYPE OF REQUEST. Please check all that apply, then fill out the specified parts of the form.

☐ Add a New Minor (complete all portions)

☒ Change an Existing Minor (complete C, D, E, G, H, and I)
  ☐ Add existing course or courses to requirements or electives
  ☒ Add new course(s) to requirements or electives (attach completed course form for each)
  ☒ Delete courses from requirements or electives

☐ Terminate a Minor (complete E, G, H, and I)

C. GENERAL INFORMATION.

Number of Current Credit Hours (for existing minors): 24
Number of Proposed Credit Hours (for new or changing minors): 21 (for Honors students only)

Catalog year in which changes will take effect: FALL 2016

☐ Interdisciplinary (please see guidelines on the Curriculum Committee website and include acknowledgments from relevant departments)

According to academic policy, students may not obtain a major/concentration and minor in the same subject. Will students in specific majors be prohibited from declaring this minor because of this policy?
☒ Yes—Which major(s) or concentration(s)? BIOC and CHEM
☐ No

D. CURRICULUM. For a changed minor, please list every change you are making below AND attach the current catalog entry for this minor (from the Minor Requirements section) with changes marked in RED. Additions should show where the course will be inserted, deletions should be noted by crossing out the course, and moves indicated with arrows. Distinguish between required and elective courses, and note any prerequisites, co-requisites, sequencing, or other restrictions. For each new course, submit the Curriculum Committee’s Course Form and a sample syllabus. For a new program, please submit the complete curriculum and catalog description exactly as they should appear in the catalog.

This form was last updated on 6/6/2013 and replaces all others.
Chem 111
Chem 111L
Chem 112
Chem 112L

OR

HONS 190
HONS 190L

OR

HONS 191
HONS 191L
HONS 294
HONS 294L

The rest of the curriculum remains unchanged. In a few years, the HONS 191/294 option can be dropped.

E. RATIONALE AND EXPLANATION. Please provide a narrative addressing the request you are making and why you are making it. In addition, for a new minor, please address its objectives, provide evidence of student interest (e.g. interviews with student focus groups, enrollment in special-topics courses in this area), and explain how the minor supports the liberal arts tradition as well as the mission of the institution.

In Fall 2011, the Department of Chemistry and Biochemistry expanded its Honors Chemistry sequence from a traditional year-long general chemistry sequence to a four semester 1-2-1 sequence. 1-2-1 refers to a non-traditional sequence of one semester of general chemistry, followed by two semesters of organic chemistry, and a final semester of general chemistry. Our HONS 191/HONS 192/HONS 293/ HONS 294 sequence has seen its first graduates and the early exposure to organic chemistry has had the desired effect of getting talented students invested into the core curriculum of chemistry (organic and beyond) earlier. Honors students in the new sequence perform better in organic chemistry than do honors students in the traditional 2-2 sequence of courses (Chem 111/Chem 112/ Chem 231/Chem 232). One drawback of the new sequence is that Honors students cannot take another key course in the curriculum, Chem 220, until their junior year (Chem 112 or HONS 294 is a pre-requisite). This then delays their ability to take Physical Chemistry as well, since Physical Chemistry has a Chem 220 pre-requisite. Another development since 2011 is that the MCAT has been modified to include topics in biochemistry; to be fully prepared for the MCAT biochemistry coverage, CoC students should be taking the full year of biochemistry (which requires a full year of organic as a pre-requisite). Another issue with the new sequence is that there is substantial student attrition by HONS 294. Some of this is due to students deciding to not be a science major, but many of the Honors students are simply going back to take Chem 112 instead of the equivalent (at least in topic coverage) HONS 294. It is difficult for us to continue justifying offering HONS 294 and HONS 294L to under a dozen students when Chem 112 lectures and labs are oversubscribed.

Because of the rigors of organic chemistry and because this challenging course is now occurring in freshmen year, the Honors College has been placing only highly qualified students into the Honors chemistry sequence. Students typically have to be enrolled in calculus or beyond, have two years of high school chemistry and/or AP credit for chemistry (which they decline to enroll in the sequence). The students in HONS 191 perform at a very high level, as evidenced by standardized exam scores used in both Chem 111 and HONS 191. The average score for Chem 111 students on the ACS (American Chemical Society) standardized exam is 43/70 (52nd percentile) whereas the HONS 191 students scores in the 90th percentile nationwide. To give you an idea of the caliber of students selected to participate, both of the College’s prestigious Goldwater Scholarship recipients were graduates of our 1-2-1 sequence and opted to become biochemistry/chemistry majors BECAUSE of this sequence.
We propose to replace HONS 191/191L and HONS 294/294L with a single 5-credit course, HONS 190 (4) - HONS 190L (1). Instead of a 1-2-1 sequence, these very capable Honors students will be taking an accelerated general chemistry course that covers most of the material traditionally covered in Chem 111/Chem 112, in a single 5-credit lecture/lab combination spanning one semester. We call the new Honors sequence “Super 1-2”. Such accelerated, condensed general chemistry courses are common at other universities for elite students. In fact, prior to the existence of the Honors College, the Chemistry Department at CoC did offer an accelerated version of Chem 111/Chem 112 accessible only via chemistry placement exam. When an Honors curriculum was put into place, they preferred a traditional 2-semester sequence. Honors versions of Chem 111 and Chem 112 (HONS 153 and HONS 154) were introduced and the accelerated chemistry course was no longer offered. We feel that the Honors students are of sufficiently high caliber and the Honors program is sufficiently diligent with placement to make this a true Honors course, a course that eliminates the slow monotonous repetition of high school chemistry most of these students have already mastered and a course that gives a competitive advantage to those who complete it.

We feel that this sequence will better meet the needs of our honors majors (and biology honors majors, if they happen to take the Honors Chemistry instead of Honors Biology). The following advantages emerge with this new design:

- Students can take Chem 220 earlier, even as early as 2nd semester freshmen year or in the summer after freshmen year. This is a key course for the major and the minor.
- Honors students can start biochemistry in the second semester of their sophomore year. This earlier start to biochemistry will help honors students complete the year sequence of biochemistry before taking the MCAT.
- Honors students will be more likely to participate in the department’s upper-level elective courses by finishing required courses earlier.
- Earlier completion of the core courses will facilitate early start in research.
- The course enables early degree completions.
- The new course eliminates the need for Chem 294/294L, which has been offered to a very small number of students because of attrition throughout the four-semester Honors sequence. This adds back teaching capacity to the department.
- An unintended consequence of 1-2-1 was that it slowed the honors student’s progression through our curriculum. The new course (and sequence) allows us to accelerate their progression through the curriculum.

The Super 1-2 option creates a true Honors course, one that requires substantial preparation in high school and that covers material at a deeper level and at a more rapid pace. Prior to 2011, the Honors chemistry sequence (153-154) was simply a regular chemistry course that happened to be taught to Honors students. With the progression to 1-2-1, we have provided more challenge to the Honors students, but the courses are still very traditional and in fact map quite well onto the normal Chem 111/Chem 112/Chem 231/Chem 232 courses. This hopefully last version will get it all correct—provide a challenging sequence worthy of the HONORS acronym AND a sequence that opens up curricular options for these best students instead of closing down options. We have for the past two years asked the Honors students enrolled in HONS 191 if they would have liked this option and they have been very enthusiastic about the idea.

The only potential drawback to the new sequence is the 5-credits. We feel 4 lecture periods per week will be required to capture all of the material in HONS 191/HONS 294 at a sufficient level of detail to prepare students for the rigor of organic chemistry, Chem 220 and other upper level courses. While many of these students come with AP credit in hand, we always recommend students take the general chemistry sequence prior to launching into organic chemistry. It is the rare, rare student who can handle organic at the College with only high school preparation in general chemistry. The students will be losing one semester of lab credit, but fortunately, general chemistry lab credits are not tabulated by our accrediting agency, the American Chemical Society. Given that Honors students participate in chemistry research usually for two full years, we are not concerned with the loss of a single credit hour of lab at the lower level. Lastly, since most enrolled students in the new sequence will have AP credit for Chem 111 and Chem 112, they could still accept this credit. If a graduate program in biology, chemistry or a medical school counts chemistry credit hours instead of looking at content covered, these students would still be covered. Likewise, students who withdraw from science after taking the “Super 1” course could still have their general education in natural sciences completed.

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT.

This form was last updated on 6/6/2013 and replaces all others.
<table>
<thead>
<tr>
<th>Program Goals</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the major or program?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. The Chemistry minor will demonstrate proficiency in the general chemistry.</td>
<td>How: ACS Exam (general)</td>
</tr>
<tr>
<td></td>
<td>Who: All students taking general chemistry</td>
</tr>
<tr>
<td></td>
<td>When: as part of HONS 190</td>
</tr>
<tr>
<td></td>
<td>How well: We expect that, on average, our students will score at or above the 60% percentile on this instrument in terms of their overall score</td>
</tr>
<tr>
<td>2. The Chemistry minor will demonstrate proficiency in organic chemistry or physical chemistry</td>
<td>How: ACS Exam (organic or physical)</td>
</tr>
<tr>
<td></td>
<td>Who: All students taking organic or physical chemistry</td>
</tr>
<tr>
<td></td>
<td>When: As final exam in 231/232 or 341/342</td>
</tr>
<tr>
<td></td>
<td>How Well: We expect that, on average, our students will score at or above the 60% percentile on this instrument in terms of their score on at least one of the sub-disciplinary test areas.</td>
</tr>
</tbody>
</table>

**G. IMPACT ON EXISTING PROGRAMS AND COURSES.** Please describe the impact of this request on other programs and courses. If you are deleting a minor, please identify all programs that will be affected. If you are adding or changing a minor, please explain any overlap with existing programs at the College.

Biology honors students are often in the chemistry honors sequence instead of the biology honors sequence. This depends on many factors, the primary one being that Honors science students can only enroll in one Honors science sequence (Physics, Chemistry or Biology). Since enrollment is sometimes problematic in Honors biology, many biology majors end up taking Honors Chemistry instead (most students are undeclared at this point). The current chemistry requirement for a BS major in Biology is Chem 111/Chem 112/ Chem 231/Chem 232. For Honors Biology majors, the chemistry requirement is sometimes met by completing Hons 191/Hons 192/-Hons 293/ Hons 294. The new course also allows honors biology majors to finish their chemistry more quickly. For those majors completing the new sequence, they will have 3 fewer credits in Chemistry when they graduate. This could be problematic for biology students who intend to enroll in graduate programs that count the number of chemistry courses taken, rather than look at the content of those courses. Such students might need to supplement their chemistry with an additional course, with a logical option being biochemistry.

Another consideration is how to tally science general education courses for students in this sequence. The vast majority of students in this sequence will likely be taking biology, physics and more chemistry courses, so there are any number of possible sequences that fulfill general education in the sciences. We would request that HONS 190 plus HONS 192 count for general education in the natural sciences (this would replace the current HONS 191-HONS 192 general education sequence). The main complication arises if a student completed HONS 190, but then chose not to pursue more science; they will have completed two courses worth of lecture material in the natural sciences, but only one lab course. Many of these students may already have AP credit for courses Chem 111/111L and Chem 112/112L which can serve as their Gen

*This form was last updated on 6/6/2013 and replaces all others.*
Ed sequence. If they only received AP credit for Chem 111 (an AP score of 3), that student could pursue a different natural science or take Chem 112/112L. We will be requesting that HONS 190-Chem 112 replace the current HONS 191-Chem 112.

H. COSTS. List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.

Cost savings include the net elimination of a course and a lab that was being offered to as few as 10 students in the past (HONS 294/294L).

I. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☒ (For new courses only) I have attached a syllabus.

☒ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☒ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

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FACULTY CURRICULUM COMMITTEE
COURSE FORM

Instructions:
- Please fill out one of these forms for each course you are adding, changing, deactivating, or reactivating.
- Fill out the parts of the form specified in part B. You must do this before your request can move forward!
- Remember that your changes will not be implemented until the next catalog year at the earliest.
- If you have questions, start by checking the instructions on the website. Please feel free to contact the committee chairs with any remaining questions you might have.

A. CONTACT/COURSE INFORMATION.

Name: Pam Riggs-Gelasco    Phone: 3-5587    Email: gelascop@cofc.edu

Department or Program: CHEM School: SSM

Subject/Acronym and Course Number: HONS 191/191L; HONS 294/294L

Catalog Year in which changes will take effect: FALL 2016

B. TYPE OF REQUEST. Please check all that apply, then fill out the specified parts of the form.

☐ Add a New Course (complete parts C, D, F, G, H, I, J)
☐ Change Part of an Existing Course (complete parts C, D, E, F, G, I, J)
   ☐ Course Number (you must submit a course deactivation request for the old course number)
   ☐ Course Name
   ☐ Course Description
   ☐ Credit/Contact Hours
   ☐ Restrictions (prerequisites, co-requisites, junior/senior standing, etc.)
☒ Deactivate an Existing Course (complete parts C, D, E, G, I, J)
☐ Reactivate a Previously-Deactivated Course (complete parts C, D, E, G, I, J)

C. RATIONALE AND EXPLANATION. Please describe your request and explain why you are making it.

In Fall 2011, the Department of Chemistry and Biochemistry expanded its Honors Chemistry sequence from a traditional year-long general chemistry sequence to a four semester 1-2-1-1 sequence. 1-2-1 refers to a non-traditional sequence of one semester of general chemistry, followed by two semesters of organic chemistry, and a final semester of general chemistry. Our HONS 191/HONS 192/HONS 293/ HONS 294 sequence has seen its first graduates and the early exposure to organic chemistry has had the desired effect of getting talented students invested into the core curriculum of chemistry (organic and beyond) earlier. Honors students in the new sequence perform better in organic chemistry than do honors students in the traditional 2-2 sequence of courses (Chem 111/Chem 112/ Chem 231/ Chem 232). One drawback of the new sequence is that Honors students cannot take another key course in the curriculum, Chem 220, until their junior year (Chem 112 or HONS 294 is a pre-requisite). This then delays their ability to take Physical Chemistry as well, since Physical Chemistry has a Chem 220 pre-requisite. Another development since 2011 is that the MCAT has been modified to include topics in biochemistry; to be fully prepared for the MCAT biochemistry coverage, CoFC students should be taking the full year of biochemistry (which requires a full year of organic as a pre-requisite). Another issue with the new sequence is that there is substantial student attrition by HONS 294. Some of this is due to students deciding to not be a science major, but many of the Honors students are simply going back to take Chem 112 instead of the equivalent (at least in topic coverage) HONS 294. It is difficult for us to continue justifying offering HONS 294 and HONS 294L to under a dozen students when Chem 112 lectures and labs are oversubscribed.

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Because of the rigors of organic chemistry and because this challenging course is now occurring in freshmen year, the Honors College has been placing only highly qualified students into the Honors chemistry sequence. Students typically have to be enrolled in calculus or beyond, have two years of high school chemistry and/or AP credit for chemistry (which they decline to enroll in the sequence). The students in HONS 191 perform at a very high level, as evidenced by standardized exam scores used in both Chem 111 and HONS 191. The average score for Chem 111 students on the ACS (American Chemical Society) standardized exam is 43/70 (52\textsuperscript{nd} percentile) whereas the HONS 191 students score in the 90\textsuperscript{th} percentile nationwide. To give you an idea of the caliber of students selected to participate, both of the College’s prestigious Goldwater Scholarship recipients were graduates of our 1-2-1 sequence and opted to become biochemistry/chemistry majors BECAUSE of this sequence.

We propose to replace HONS 191/191L and HONS 294/294L with a single 5-credit course, HONS 190 (4) -HONS 190L (1). Instead of a 1-2-1 sequence, these very capable Honors students will be taking an accelerated general chemistry course that covers most of the material traditionally covered in Chem 111/Chem 112, in a single 5-credit lecture/lab combination spanning one semester. We call the new Honors sequence “Super 1-2”. Such accelerated, condensed general chemistry courses are common at other universities for elite students. In fact, prior to the existence of the Honors College, the Chemistry Department at CofC did offer an accelerated version of Chem 111/Chem 112 accessible only via chemistry placement exam. When an Honors curriculum was put into place, they preferred a traditional 2-semester sequence. Honors versions of Chem 111 and Chem 112 (HONS 153 and HONS 154) were introduced and the accelerated chemistry course was no longer offered. We feel that the Honors students are of sufficiently high caliber and the Honors program is sufficiently diligent with placement to make this a true Honors course, a course that eliminates the slow monotonous repetition of high school chemistry most of these students have already mastered and a course that gives a competitive advantage to those who complete it.

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* Students can take Chem 220 earlier, even as early as 2\textsuperscript{nd} semester freshmen year or in the summer after freshmen year. This is a key course for the major and the minor.
* Honors students can start biochemistry in the second semester of their sophomore year. This earlier start to biochemistry will help honors students complete the year sequence of biochemistry before taking the MCAT.
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* The course enables early degree completions.
* The new course eliminates the need for Chem 294/294L, which has been offered to a very small number of students because of attrition throughout the four-semester Honors sequence. This adds back teaching capacity to the department.
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The only potential drawback to the new sequence is the 5-credits. We feel 4 lecture periods per week will be required to capture all of the material in HONS 191/HONS 294 at a sufficient level of detail to prepare students for the rigors of organic chemistry, Chem 220 and other upper level courses. While many of these students come with AP credit in
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D. IMPACT ON EXISTING PROGRAMS AND COURSES. Please briefly describe the impact of your request on your own programs and courses as well other programs and courses. If another program requires the course, you must submit their written acknowledgement with this proposal. Also, the affected program must describe any change in the number of credit hours they require. Include a list of similar courses in other departments and explain any overlap.

Courses are being replaced by HONS 190/190L.
E. EXISTING COURSE INFORMATION. If you are proposing a new course, just leave this blank. Otherwise, please fill out all fields.

Department: Chem  School: SSM  Subject Acronym: HONS  Course Number: 191/191L; 294/294L

191:
Credit hours:  _3_ lecture  _1_ lab  __ seminar __ independent study
Contact hours:  _150 minutes_ lecture  _1_ lab  __ seminar __ independent study

191L
Credit hours:  __ lecture  _1_ lab  __ seminar __ independent study
Contact hours:  __ lecture  _3_ lab  __ seminar __ independent study

294
Credit hours:  _3_ lecture  _1_ lab  __ seminar __ independent study
Contact hours:  _150 minutes_ lecture  _1_ lab  __ seminar __ independent study

294L
Credit hours:  _1_ lecture  _1_ lab  __ seminar __ independent study
Contact hours:  _1_ lecture  _3_ lab  __ seminar __ independent study

HONS 191 Course title: Honors Chemical Principles: Atoms to Molecules

HONS 191 Course description (maximum 50 words, exactly as it appears in the catalog):
Introductory chemistry course presenting theoretical principles and fundamental facts for understanding chemical compounds starting with the atom, building to molecules.

HONS 191 Restrictions (pre-requisites, co-requisites, majors only, etc.):
Pre-req: Math 111 Co-req: HONS 191L
Cross-listing, if any:

Is this course repeatable?  □ yes  ☒ no  If yes, how many total credit hours may the student earn?  ____

HONS 191L Course title: Honors Chemical Principles Laboratory

HONS 191L Course description (maximum 50 words, exactly as it appears in the catalog):
Introductory chemistry laboratory course presenting practical applications related to concepts from lecture. This course stresses student development of proper technique, application of the scientific method, data analysis, and reporting of scientific data. Formal 1-2 page reports required for experiments.

HONS 191L Restrictions (pre-requisites, co-requisites, majors only, etc.):
Pre-req: Math 111 Co-req: HONS 191
Cross-listing, if any:

Is this course repeatable?  □ yes  ☒ no  If yes, how many total credit hours may the student earn?  ____

HONS 294 Course title: Honors Chemical Principles: Mathematical Treatment of Equilibrium and Kinetics, Introduction to Nuclear Chemistry

HONS 294 Course description (maximum 50 words, exactly as it appears in the catalog):

This form was last updated on 12/13/13 and replaces all others.
This course provides quantitative/mathematical understanding of kinetics and thermodynamics describing chemical reactions, including mathematical applications and problem solving skills related to theories necessary to understand the central role of chemistry for all molecular sciences.

HONS 294 Restrictions (pre-requisites, co-requisites, majors only, etc.):
Co-req: Math 220 strongly recommended HONS 294L
Cross-listing, if any:

Is this course repeatable? ☐ yes ☒ no If yes, how many total credit hours may the student earn? _____

HONS 294L Course title: Honors Chemical Principles Laboratory: Mathematical Treatment of Equilibrium and Kinetics, Introduction to Nuclear Chemistry

HONS 294L Course description (maximum 50 words, exactly as it appears in the catalog):
This course provides quantitative/mathematical understanding of kinetics and thermodynamics describing chemical reactions, including mathematical applications and problem solving skills related to theories necessary to understand the central role of chemistry for all molecular sciences.

HONS 294L Restrictions (pre-requisites, co-requisites, majors only, etc.):
Co-req: HONS 294 Math 220 recommended
Cross-listing, if any:

Is this course repeatable? ☐ yes ☒ no If yes, how many total credit hours may the student earn? _____

F. NEW COURSE INFORMATION. If you are deactivating a course, leave this blank. Otherwise, please fill out all fields. For changed courses, use boldface for the information that is changing.

Department: School: Subject Acronym: Course Number:

Credit hours: __ lecture __ lab __ seminar __ independent study
Contact hours: __ lecture __ lab __ seminar __ independent study

Course title:

Course description (maximum 50 words, exactly as it appears in the catalog):

Restrictions (pre-requisites, co-requisites, majors only, etc.):

If this is a newly-created course, is it intended to be the equivalent of an existing course? ☐ yes ☐ no
If so, which course? _______________

If equivalent, will the newly-created course replace the existing course? ☐ yes ☐ no

Note: If yes, you must deactivate that course by submitting an additional Course Form.
Cross-listing, if any (submit approval from relevant department): ________________

Note: Cross-listed courses are equivalent.

Is this course repeatable? □ yes □ no If yes, how many total credit hours may the student earn? ___

Is there an activity, lab, or other fee associated with this course? □ yes □ no What is the fee? $_____

Note: The Senate cannot approve new fees; Business Affairs will submit any such request to the Board of Trustees. The course can still be created, but the fee will not be attached until the Board has approved it.

G. COSTS. List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.

Cost savings to department not having to cover 294/294L

I. PROGRAM CHANGES. Will this course be added to the existing degree requirements or list of approved electives of a major, minor, or concentration? □ yes □ no

If yes, please attach a Change Minor and/or Change Major/Program Form as appropriate.

J. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☒ (For new courses only) I have attached a syllabus.

☒ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☒ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.

This form was last updated on 12/13/13 and replaces all others.
Honors 190, Honors Chemical Principles
Fall 2016

Instructor: Dr. Jason Overby
Office: SSMB 318
Office Hours: MWF 10-12; others by arrangement (contact me directly, email, phone)
e-mail: overbyj@cofc.edu
Homepage: http://overbyj.people.cofc.edu/
Phone: 953-8098

Description of Course

An introductory course presenting theoretical principles and fundamental facts for understanding matter ranging from atoms to chemical compounds. This course also provides quantitative understanding of the behavior of matter as it relates to kinetic and thermodynamic principles.

Co-requisites and prerequisites

Honors 190L must be taken concurrently. Unless students exempt Math 111 or have completed this course as a prerequisite, they are required to Math 111 as a co-requisite.

Materials

ALEKS (Purchased online) ALEKS contains an ebook that will serve as the primary source of the text. The book used is Chemistry: Atoms First, 2nd Edition, Burdge and Overby.

Online Materials

Please visit OAKS for up-to-date information concerning the course. There will be regular assignments in both Connect and ALEKS. These will be the source for graded online assignments.

Learning Objectives

Upon completion of this course, students should be able to:

Apply common mathematical techniques in the solving of chemical problems such as stoichiometry, gas law, thermodynamics and kinetics.
Distinguish, classify and explain the properties of compounds.
Recognize and explain the fundamental nature of chemical reactivity.
Understand the connection between bonding theories and molecular structure.
General Education Learning Objectives

Upon completion of this course, students should be able to:

Apply physical/natural principles to analyze and solve problems.
Develop an understanding of the impact that science has on society.

The general education learning objectives will be assessed in the laboratory portion of HONS 192 as a written report that will count for 5% of the final grade.

Course Coverage

These are the topics we will cover in this course.

Chapter 2—The Atom
  2.1 Subatomic Particles and Atomic Structure
  2.2 Atomic Number, Mass Number, and Isotopes
  2.3 The Periodic Table
  2.4 Nuclear Stability
  2.5 Average Atomic Mass
  2.6 The Periodic Table
  2.7 The Mole and Molar Masses

Chapter 3—Quantum Theory and the Electronic Structure of Atoms
  3.1 Energy and Energy Changes
  3.2 The Nature of Light
  3.3 Quantum Theory
  3.4 Bohr’s Theory of the Hydrogen Atom
  3.5 Wave Properties of Matter
  3.6 Quantum Mechanics
  3.7 Quantum Numbers
  3.8 Atomic Orbitals
  3.9 Electron Configuration
  3.10 Electron Configurations and the Periodic Table

Chapter 4—Periodic Trends of the Elements
  4.1 Development of the Periodic Table
  4.2 The Modern Periodic Table
  4.3 Effective Nuclear Charge
  4.4 Periodic Trends in Properties of Atoms
  4.5 Electron Configuration of Ions
  4.6 Ionic Radius
Chapter 5—Ionic and Covalent Compounds
5.1 Lewis Dot Symbols
5.2 Ionic Compounds and Bonding
5.3 Naming Ions and Ionic Compounds
5.4 Covalent Molecules and Bonding
5.5 Naming Molecular Compounds
5.6 Molecular and Formula Masses
5.7 Percent Composition of Compounds
5.8 The Mole and Molar Masses

Chapter 6—Lewis Structures
6.1 Lewis Structures
6.2 Electronegativity and Polarity
6.3 Drawing Lewis Structures
6.4 Lewis Structures and Formal Charge
6.5 Resonance
6.6 Exceptions to the Octet Rule

Chapter 7—Molecular Geometry and Bonding Theories
7.1 Molecular Geometry
7.2 Molecular Geometry and Polarity
7.3 Intermolecular Forces
7.4 Valence Bond Theory
7.5 Hybridization of Atomic Orbitals
7.6 Hybridization in Molecules Containing Multiple Bonds
7.8 Bonding Theories and Descriptions of Molecules with Delocalized Bonding

Chapter 8—Chemical Reactions
8.1 Chemical Equations
8.2 Combustion Analysis
8.3 Calculations with Balanced Chemical Equations
8.4 Limiting Reactants

Chapter 9—Chemical Reactions in Aqueous Solutions
9.1 General Properties of Aqueous Solutions
9.2 Precipitation Reactions
9.3 Acid-Base Reactions
9.4 Oxidation–Reduction Reactions
9.5 Concentration of Solutions

Chapter 10—Thermochemistry
10.1 Energy and Energy Changes
10.2 Introduction to Thermodynamics
10.3 Enthalpy
10.5 Hess’s Law
10.6 Standard Enthalpies of Formation
10.7 Bond Enthalpy and the Stability of Covalent Molecules
Chapter 14—Entropy and Free Energy
   14.1 Spontaneous Processes
   14.2 Entropy
   14.3 Entropy Changes in a System
   14.4 Entropy Changes in the Universe
   14.5 Predicting Spontaneity
   14.6 Thermodynamics in Living Systems

Chapter 15—Chemical Equilibrium
   15.1 The Concept of Equilibrium
   15.2 The Equilibrium Constant
   15.3 Equilibrium Expressions
   15.4 Chemical Equilibrium and Free Energy
   15.5 Calculating Equilibrium Concentrations
   15.6 Le Châtelier's Principle: Factors That Affect Equilibrium

Chapter 16—Acids, Bases, and Salts
   16.1 Brønsted Acids and Bases
   16.2 Molecular Structure and Acid Strength
   16.3 The Acid-Base Properties of Water
   16.4 The pH and pOH Scales
   16.5 Strong Acids and Bases
   16.6 Weak Acids and Acid Ionization Constants
   16.7 Weak Bases and Base Ionization Constants
   16.8 Conjugate Acid-Base Pairs
   16.10 Acid-Base Properties of Salt Solutions
   16.12 Lewis Acids and Bases

Chapter 17—Acid-Base Equilibria and Solubility Equilibria
   17.1 The Common Ion Effect
   17.2 Buffer Solutions

Chapter 18—Electrochemistry
   18.2 Galvanic Cells
   18.3 Standard Reduction Potentials
   18.4 Spontaneity of Redox Reactions Under Standard-State Conditions
   18.5 Spontaneity of Redox Reactions Under Non-Standard State Conditions

Chapter 19—Chemical Kinetics
   19.1 Reaction Rates
   19.2 Collision Theory of Chemical Reactions
   19.3 Measuring Reaction Progress and Expressing Reaction Rate
   19.4 Dependence of Reaction Rate on Reactant Concentration
   19.5 Dependence of Reactant Concentration on Time
   19.6 Dependence of Reaction Rate on Temperature
   19.7 Reaction Mechanisms
   19.8 Catalysis
Class policies

Attendance at all class meetings is expected. You are expected to budget your time wisely and meet your obligations for this class. Experience has demonstrated that there is a strong correlation between your grade in the class and your attendance. You are responsible for learning the material when you miss class. My time in office hours is not for catching you up on material you missed. In the event you miss a lecture period, please check OAKS for a synopsis of that day’s lecture.

Grading Scheme

Examinations 65%
ALEKS 15%
Final Exam 20%

Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>92-100</td>
<td>D+</td>
<td>68-69</td>
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<td>A−</td>
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<td>D</td>
<td>62-67</td>
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<tr>
<td>B+</td>
<td>88-89</td>
<td>D−</td>
<td>60-61</td>
</tr>
<tr>
<td>B</td>
<td>82-87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B−</td>
<td>80-81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C+</td>
<td>78-79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>72-77</td>
<td></td>
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</tr>
<tr>
<td>C−</td>
<td>70-71</td>
<td></td>
<td></td>
</tr>
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</table>

Grading scale is fixed. All rules of rounding followed. There is not a curve.

Grading Policies

If you attempt all six of the exams, the lowest of your six exam scores will count 5% while the remaining five exams count 12%. Thus, the five highest extra credit exam scores will comprise 60% of the 65% of your extra credit exam grades and the remaining 5% will result from the lowest exam score.

It is not my policy to allow make-up extra credit examinations. In the event you do have to miss an examination, you must notify me as soon as possible so suitable accommodations can be made. If you fail to confer with me concerning a missed examination, you will receive a zero for that examination.

The Honor system is in effect in all your efforts for this course. Cheating will not be tolerated. If you are caught cheating, a grade of “F” will automatically be given and you will be brought before the Honor Board. By enrolling in this course, you are agreeing to abide by the Departmental policy on Scientific Integrity.

Take all four exams, Low exam counts five percent. One bad day ok.

Make-up exams hard. Only the excused can try. Don’t miss an exam!

Honor system, yes! Do not cheat! You will get F! Just try me and see.
Examination Schedule

There are six exams given over the course of the semester. The dates of the exams are flexible but you will always be given at least one week's notice before any of the in-class exams.

Final Examination Information

The extra credit final examination is a standardized examination containing 70 multiple choice questions and was prepared by the American Chemical Society. This is a timed exam (110 minutes).

Important Dates

October 23 – Last day to withdraw from classes with the grade of "W"
November 3 – Fall Break
November 4 – Election Day. No classes.
December 1 – Last day of classes
December 3 – Final exam, 9 am
Honors 190L
Principles of Chemistry Laboratory
Fall 2016

Instructor: Dr. Jason S. Overby
Office: SSMB 318
Office Hours: MWF 9-12 others by arrangement
e-mail: overbyj@cofc.edu
Phone 953-8098

Description of Course

Introductory chemistry laboratory course presenting practical applications related
to concepts from lecture. This course stresses student development of proper
technique, application of scientific method, data analysis, and reporting of scientific
data.

Co-requisites and prerequisites

Honors 191 is a co-requisite for Honors 191L. If you drop one of the courses, you
must drop the other.

Text and supplies (required)

Honors 191L Principles of Chemistry Laboratory Manual
Lab coat
Goggles
Gloves

Hons 191L Lab Learning Objectives

- Develop an understanding of the scientific method in a chemistry laboratory
  setting
- Practice and illustrate the application of mathematical manipulations of
  integrated chemical principles
- Interpret scientific data

The general education learning objectives will be assessed in the laboratory portion of
HONS 192 as a written report that will count for 5% of your final grade.
Class policies

Attendance is mandatory at all laboratory periods. If you must miss your laboratory period, there is no guarantee of attending another laboratory period to make up your missed work. If you choose to miss a laboratory period for any unexcused reason, you will receive zero credit for that laboratory period. A grade of “WA” will be assigned for missing four or more labs for any reason.

Grading scale

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>93-100</td>
<td>A</td>
</tr>
<tr>
<td>90-92</td>
<td>A−</td>
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<td>88-89</td>
<td>B+</td>
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<td>83-87</td>
<td>B</td>
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<tr>
<td>60-62</td>
<td>D−</td>
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<tr>
<td>&lt;60</td>
<td>F</td>
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</tbody>
</table>

Grading scheme

- Laboratory reports and quizzes 65%
- Laboratory notebook 5%
- Student deportment 5%
- Final Exam 25%

Student Evaluation

The format for lab reports is printouts of Excel spreadsheets. The spreadsheets will be available on OAKS for the given experiment. When turning in reports, staple all the pages together and ensure your name and section are written on the first page.

Lab reports are always due by Thursday at noon. Late lab reports incur 25% penalty per day late.

Pre-lab quizzes will be given throughout the semester. The purpose of quizzes is to encourage you to prepare for lab. Quizzes are given at the beginning of the class period. Some quizzes may be delivered through OAKS. There will be no make-up or excused quizzes therefore it is your responsibility to arrive to lab on time. However, you will be allowed to drop the lowest quiz score when determining the final grade.

Failure to adhere to these or any other safety rules will result in dismissal from the laboratory with a grade of zero for that laboratory period.
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Experiment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oct 31</td>
<td>Introduction to Honors Course</td>
</tr>
<tr>
<td>2</td>
<td>Sept 7</td>
<td>Introduction to Laboratory Measurements</td>
</tr>
<tr>
<td>3</td>
<td>Sept 14</td>
<td>Chemical Kinetics of an Electrolyte Solution</td>
</tr>
<tr>
<td>4</td>
<td>Sept 21</td>
<td>Introduction to Atomic and Molecular Spectroscopy</td>
</tr>
<tr>
<td>5</td>
<td>Oct 5</td>
<td>Introduction to Molecular Modeling using ChemDraw</td>
</tr>
<tr>
<td>6</td>
<td>Oct 12</td>
<td>Electrochemistry</td>
</tr>
<tr>
<td>7</td>
<td>Oct 19</td>
<td>Fall Break</td>
</tr>
<tr>
<td>8</td>
<td>Oct 26</td>
<td>Induction Titration of Professional Chlorine Bleach</td>
</tr>
<tr>
<td>9</td>
<td>Nov 2</td>
<td>Thermochemistry</td>
</tr>
<tr>
<td>10</td>
<td>Nov 16</td>
<td>Acid-Base Titrations</td>
</tr>
<tr>
<td>11</td>
<td>Nov 24</td>
<td>Kinetics of Acid-Catalyzed Reduction Reaction</td>
</tr>
<tr>
<td>12</td>
<td>Nov 30</td>
<td>Laboratory Final Exam and Checks</td>
</tr>
</tbody>
</table>
Chemistry Major Requirements
Catalog Year: 2015-16
Degree: Bachelor of Arts
Credit Hours: 42+

"PR" indicates a pre-requisite. "CO" indicates a co-requisite.

Courses within this major may satisfy general education requirements. Please consult http://www.glospace.edu for more information.

Required Courses

- CHEM 111 Principles of Chemistry [G PR: MATH 111 or equivalent; CO: CHEM 111]
- CHEM 111L Principles of Chemistry Lab [L] Co: CHEM 111
- CHEM 112 Principles of Chemistry [G] PR: CHEM 111, CHEM 111L or MATH 111; CO: CHEM 112
- CHEM 112L Principles of Chemistry Lab [L] Co: CHEM 112
- CHEM 220 Fundamentals of Analytical Chemistry [G] PR: CHEM 112 and CHEM 112L or MATH 111 and MATH 111L; Co: CHEM 220L
- CHEM 220L Fundamentals of Analytical Chemistry Lab [L] PR: CHEM 112 and CHEM 112L or MATH 111 and MATH 111L; Co: CHEM 220
- CHEM 231L Introduction to Organic Chemistry Laboratory Techniques [L] Co: CHEM 231
- CHEM 232 Organic Chemistry [G] PR: CHEM 231, CHEM 231L or CHEM 232L
- CHEM 341 Thermodynamics, Statistical Thermodynamics and Chemical Kinetics [G] PR: CHEM 230, CHEM 230L, MATH 229 or (MATH 228 and MATH 228L); Co: CHEM 341
- CHEM 341L Thermodynamics, Statistical Thermodynamics and Chemical Kinetics Laboratory [L] Co: CHEM 341
- CHEM 342 Quantum Chemistry and Spectroscopy [G] PR: CHEM 230L, MATH 229 or (MATH 228 and MATH 228L); Co: CHEM 342L
- CHEM 342L Quantum Chemistry and Spectroscopy Laboratory [L] Co: CHEM 342

- CHEM 492 Senior Seminar [1] PR: CHEM 391 and seniorness

Additional Chemistry Electives: Select 9 credit hours from any 300-level or above CHEM course excluding CHEM 482.
CHEM 381 * Internship (1, repeatable up to 4) Pr: Junior or senior standing and at least a 2.50 GPA both overall and in major
CHEM 399 * Tutorial (3, repeatable up to 12) Pr: Junior or senior standing and at least a 2.50 GPA both overall and in major
CHEM 411 Instrumental Methods of Analysis (3) Pr: CHEM 220, CHEM 221; Co: CHEM 421
CHEM 412 Instrumental Laboratory (1) Pr: CHEM 220, CHEM 221; Co: CHEM 421
CHEM 422 Environmental Chemistry (3) Pr: CHEM 220, CHEM 221
CHEM 424 Environmental Chemistry Laboratory (1) Pr: or Co: CHEM 422
CHEM 433 Advanced Organic Chemistry (3) Pr: CHEM 332, CHEM 333, CHEM 341
CHEM 441 Advanced Physical Chemistry I (3) Pr: CHEM 441, CHEM 341
CHEM 481 Introductory Research (2) Pr: Instructor permission
CHEM 482 Introductory Research II (2) Pr: Instructor permission
CHEM 490 Chemistry and Biotechnology Seminar (1) Pr: Junior or senior standing
CHEM 499 Bachelor's Essay (3) Pr: Instructor permission; a project proposal must be submitted by the student to the department prior to registration for the course.

Notes: *CHEM 381 is repeatable up to 4 credit hours earned. *CHEM 399 is repeatable up to 12 credit hours earned.

Math Requirement

☐ MATH 170 Introductory Calculus I (4) Pr: Placement or C- or better in MATH 111
☐ MATH 129 Vector Calculus with Chemical Applications (5) Pr: Placement or C- or better MATH 120 or HONS 115
OR
☐ MATH 129 Calculus II (4) Pr: MATH 170 or HONS 115
AND
☐ MATH 221 Calculus III (4) Pr: MATH 220

Notes:

- Students with a double major in Physics and/or Mathematics should complete the MATH 170, 129, and 221 sequence.
- Honors students can take the alternative sequence MATH 170/129, MATH 170/129, HONS 191, HONS 192, HONS 193, HONS 291, and HONS 292 to complete the Calculus sequence in CHEM 171/172, CHEM 172/173, CHEM 221/220, and CHEM 221/220, Prerequisite: One term of General Chemistry is completed.
- All junior and senior chemistry majors are strongly encouraged to attend the scheduled departmental seminars.
- Students who have completed PHYS 101 Introductory Physics I and PHYS 102 Introductory Physics II before declaring a chemistry or biochemistry major may satisfy this requirement by taking additional related courses. Please see the department chair for the list of courses.
## Chemistry Major Requirements

**Catalog Year:** 2015-16  
**Degree:** Bachelor of Science  
**Credit Hours:** 32 +

"PR" indicates a pre-requisite. "CO" indicates a co-requisite.  
Courses within this major may also satisfy general education requirements. Please consult https://www.registrar.uark.edu/general-education for more information.

### Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>CHEM 111</td>
<td>Principles of Chemistry (3) PR: MATH 1111 or equivalent; CO: CHEM 211L</td>
</tr>
<tr>
<td>CHEM 111L</td>
<td>Principles of Chemistry Lab (1) CO: CHEM 111</td>
</tr>
<tr>
<td>CHEM 112</td>
<td>Principles of Chemistry (3) PR: CHEM 111L, CHEM 111L or MATH 125; CO: CHEM 211L</td>
</tr>
<tr>
<td>CHEM 112L</td>
<td>Principles of Chemistry Lab (1) CO: CHEM 112</td>
</tr>
<tr>
<td>CHEM 220</td>
<td>Fundamentals of Analytical Chemistry (3) PR: CHEM 112L and CHEM 112L or MATH 125 and MATH 221; CO: CHEM 220L</td>
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<tr>
<td>CHEM 220L</td>
<td>Fundamentals of Analytical Chemistry Lab (1) PR: CHEM 112L and CHEM 220L or MATH 125 and MATH 221; CO: CHEM 220L</td>
</tr>
<tr>
<td>CHEM 231</td>
<td>Organic Chemistry (3) PR: CHEM 112L, CHEM 112L or MATH 125; CO: CHEM 271L</td>
</tr>
<tr>
<td>CHEM 231L</td>
<td>Introduction to Organic Chemistry Laboratory Techniques (1) CO: CHEM 231</td>
</tr>
<tr>
<td>CHEM 252</td>
<td>Organic Chemistry (3) PR: CHEM 231L, CHEM 231L; CO: CHEM 252L</td>
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<tr>
<td>CHEM 252L</td>
<td>Organic Synthesis and Analysis (1) CO: CHEM 252</td>
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<tr>
<td>CHEM 311</td>
<td>Inorganic Chemistry (3) PR: CHEM 232L, CHEM 232L</td>
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<tr>
<td>CHEM 312L</td>
<td>Inorganic Chemistry Laboratory (1) CO: CHEM 311</td>
</tr>
<tr>
<td>CHEM 341</td>
<td>Thermodynamics, Statistical Thermodynamics and Chemical Kinetics (3) PR: CHEM 252L, MATH 221; MATH 225 or MATH 225; CO: CHEM 341L</td>
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<tr>
<td>CHEM 341L</td>
<td>Thermodynamics, Statistical Thermodynamics and Chemical Kinetics Laboratory (1) CO: CHEM 341</td>
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<tr>
<td>CHEM 342</td>
<td>Quantum Chemistry and Spectroscopy (3) PR: CHEM 252L, MATH 225 or MATH 225 and MATH 221; CO: CHEM 342L</td>
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<td>CHEM 342L</td>
<td>Quantum Chemistry and Spectroscopy Laboratory (1) CO: CHEM 342</td>
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<tr>
<td>CHEM 351</td>
<td>Biochemistry (3) PR: CHEM 232L, CHEM 232L</td>
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<tr>
<td>CHEM 371</td>
<td>Chemical Synthesis in Chemistry (3) PR: CHEM 252L, CHEM 252L, CHEM 252L, CHEM 252L</td>
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<tr>
<td>CHEN 471</td>
<td>Instrumental Methods of Analysis (3) PR: CHEM 220L, CHEM 220L, CHEM 220L, CHEM 220L, CO: CHEM 421</td>
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<tr>
<td>CHEN 472L</td>
<td>Instrumental Laboratory (1) PR: CHEM 270L, CHEM 270L, CO: CHEM 472</td>
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<tr>
<td>CHEN 490</td>
<td>Chemistry and Biochemistry Seminar (1) PR: junior or senior standing</td>
</tr>
<tr>
<td>CHEN 492</td>
<td>Senior Seminar (1) PR: CHEM 341L and senior standing</td>
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### Physics Requirement

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PHYS 111</td>
<td>General Physics I (5) PR or CO: MATH 221 or equivalent or instructor permission; CO: PHYS 111</td>
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<tr>
<td>PHYS 111L</td>
<td>General Physics I Lab (1) CO: PHYS 111</td>
</tr>
<tr>
<td>PHYS 112</td>
<td>General Physics II (5) PR, PHYS 111L or MATH 125; PR or CO: MATH 221 or equivalent or instructor permission; CO: PHYS 112</td>
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<tr>
<td>PHYS 112L</td>
<td>General Physics II Lab (1) CO: PHYS 112</td>
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</table>
Mathematics Requirement

- MATH 120  Introductory Calculus I (P: Placement or C or better in MATH 111)
- OR
- MATH 229  Vector Calculus with Chemical Applications (P: Placement or C or better in MATH 120 or PHYS 115)
- AND
- MATH 221  Calculus II (Q: P: MATH 220)

Notes:

- Students with a double major in Physics and Mathematics should complete the MATH 120, 229, and 221 sequence.
- Computer Programming (CSCI 220 and 230) is strongly recommended.
- Honors students can take the alternative sequence of PHYS 119, MATH 320, PHYS 120, HONS 119/HONS 220, HONS 220/HONS 223, HONS 223/HONS 225, and HONS 225/HCONS 227. Please note in this case, CHEM 171 is required instead of PHYS 119.
- All junior and senior chemistry majors are strongly encouraged to attend the scheduled departmental seminars.
- Students who have completed PHYS 101 Introductory Physics I and PHYS 102 Introductory Physics II before declaring a chemistry or biochemistry major may satisfy this requirement by taking additional related courses. Please see the department chair for the list of courses.
Biochemistry Major Requirements
Catalog Year: 2015-16
Degree: Bachelor of Science
Credit Hours: 75+

"PR" indicates a pre-requisite. "CO" indicates a co-requisite.

Courses within this major may also satisfy general education requirements. Please consult your academic advisor for more information.

Required Courses
- CHEM 111 Principles of Chemistry (3) Pr: MATH 171 or equivalent; Co: CHEM 171
- CHEM 111L Principles of Chemistry Lab (1) Co: CHEM 111
- CHEM 112 Principles of Chemistry (3) Pr: CHEM 111, CHEM 112 or HONS 190; HONS 190L; Co: CHEM 112L
- CHEM 112L Principles of Chemistry Lab (1) Co: CHEM 112
- CHEM 230 Fundamentals of Analytical Chemistry (3) Pr: CHEM 112 and CHEM 112L or HONS 190; HONS 190L; Co: CHEM 230L
- CHEM 250L Fundamentals of Analytical Chemistry Lab (1) Pr: CHEM 112 and CHEM 112L or HONS 190; HONS 190L; Co: CHEM 250

- CHEM 231 Organic Chemistry I (5) Pr: CHEM 112, CHEM 112L or HONS 190; MATH 220; Co: CHEM 231L
- CHEM 232L Organic Chemistry I Lab (1) Co: CHEM 231
- CHEM 233 Organic Chemistry II (5) Pr: CHEM 231, CHEM 231L; Co: CHEM 232L
- CHEM 233L Organic Chemistry II Lab (1) Co: CHEM 232
- CHEM 311 Physical Chemistry (3) Pr: CHEM 232, CHEM 232L
- CHEM 341 Thermodynamics, Statistical Thermodynamics and Chemical Kinetics (3) Pr: CHEM 232, CHEM 232L; MATH 229 or MATH 270 and MATH 272L; Co: CHEM 341L
- CHEM 342L Thermodynamics, Statistical Thermodynamics and Chemical Kinetics Laboratory (1) Co: CHEM 341
- CHEM 342 Quantum Chemistry and Spectroscopy (3) Pr: CHEM 232L, CHEM 232L; MATH 229 or MATH 270 and MATH 272L; Co: CHEM 342L
- CHEM 351 Biochemistry I (3) Pr: CHEM 232, CHEM 232L
- CHEM 352 Biochemistry II (3) Pr: CHEM 351
- CHEM 354L Biochemistry II Lab (1) Pr: CHEM 351
- CHEM 490 Chemistry and Biochemistry Seminar (1) Pr: junior or senior standing
- CHEM 492 Seminar Seminar (1) Pr: CHEM 241 and senior standing

Select 2 of the following courses that add up to a minimum of 3 lab credit hours. (Note: CHEM 371 is 2 credit hours lab and 1 credit hour lecture)

- CHEM 312L Inorganic Chemistry Laboratory (1) Co: CHEM 311
- CHEM 355 Research Methods in Biochemistry (3) Pr: CHEM 254L
- CHEM 371 Chemical Synthesis Chemistry (3) Pr: CHEM 232, CHEM 232L, CHEM 232L, CHEM 222, CHEM 222L
- CHEM 421L Instrumental Laboratory (1) Pr: CHEM 220, CHEM 220L; Co: CHEM 427
- CHEM 422L Environmental Chemistry Laboratory (3) Pr or CO: CHEM 422
- CHEM 481 Advanced Research (2) Pr: Instructor permission
CHEM 482  Introductory Research II (2) PR: Instructor permission

Select one of the following courses:
☐ ___________________________

CHEM 353  Chemical Biology (3) PR: CHEM 351
CHEM 356  Biochemical Basis of Disease (2) PR: CHEM 351
CHEM 421  Instrumental Methods of Analysis (3) PR: CHEM 220, CHEM 220L; CO: CHEM 421L
CHEM 422  Environmental Chemistry (3) PR: CHEM 220, CHEM 220L
CHEM 431  Advanced Organic Chemistry (3) PR: CHEM 232, CHEM 232L

Biology Requirement
☐ BIOL 111  Introduction to Cell and Molecular Biology (3) PR: None; CO: BIOL 111L
☐ BIOL 111L  Introduction to Cell and Molecular Biology Lab (1) CO: BIOL 111
OR
☐ HONS 151  Honors Biology I (3) PR: None; CO: HONS 151L
☐ HONS 151L  Honors Biology I Lab (1) CO: HONS 151
☐ BIOL 112  Evolution, Form, and Function of Organisms (3) PR: BIOL 111 and 111L; CO: BIOL 112L
☐ BIOL 112L  Evolution, Form, and Function of Organisms Lab (1) CO: BIOL 112
OR
☐ HONS 152  Honors Biology II (3) PR: HONS 151 and 151L; CO: HONS 152L
☐ HONS 152L  Honors Biology II Lab (1) CO: HONS 152
☐ BIOL 312  Molecular Biology (3) PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; and CHEM 111 and 111L and CHEM 112 and 112L; PR or CO: MATH 250 or instructor permission for biochemistry majors
☐ BIOL 312L  Molecular Biology Laboratory (1) PR or CR: BIOL 312 and MATH 250 or instructor permission for biochemistry majors

Physics Requirement
☐ PHYS 111  General Physics I (3) PR or CO: MATH 120 or equivalent or instructor permission; CO: PHYS 111L
☐ PHYS 111L  General Physics I Lab (1) CO: PHYS 111
☐ PHYS 112  General Physics II (3) PR: PHYS 111 or HONS 157; CO or PR: MATH 220 or equivalent or instructor permission; CO: PHYS 112L
☐ PHYS 112L  General Physics II Lab (1) CO: PHYS 112

Mathematics Requirement
☐ MATH 120  Introductory Calculus (4) PR: Placement or C- or better in MATH 111
☐ MATH 229  Vector Calculus with Chemical Applications (5) PR: Placement or C- or better MATH 120 or HONS 115
OR
☐ MATH 220  Calculus II (4) PR: MATH 120 or HONS 115
AND
☐ MATH 221  Calculus III (4) PR: MATH 220

Notes:
• Students with a double major in Physics and/or Mathematics should complete the MATH 120, 220, and 221 sequence.

• MATH 250 is a pre-requisite for all 300-level BIOL courses but can be waived with instructor permission for biochemistry majors.

• Honors students can take the alternative sequence of HONS 145/HONS 145L, HONS 192/HONS 192L, HONS 293/HONS 293L, and HONS 294/HONS 294L in lieu of CHEM 111/111L, CHEM 112/112L, CHEM 231/231L, and CHEM 232/232L.

• Honors students can take the alternative sequence of HONS 157/HONS 157L and HONS 158/HONS 158L in lieu of PHYS 111/111L and PHYS 112/112L.

• All junior and senior chemistry majors are strongly encouraged to attend the scheduled department seminars.

• Students who have completed PHYS 101 Introductory Physics I and PHYS 102 Introductory Physics II before declaring a chemistry or biochemistry major may satisfy this requirement by taking additional related courses. Please see the department chair for the list of courses.
November 30, 2015

Pamela Riggs-Gelasco
Chair, Department of Chemistry

Dear Dr. Riggs-Gelasco

The Honors Committee has reviewed and approved the new sequence for Honors Chemistry: HONS 190 and 190L (5 credits) to replace HONS 191 and 191L and 194 and 194L starting in fall 2016. The committee unanimously agreed that this integrated introductory sequence is a more compelling course for honors students who come to the College of Charleston with a foundation in Chemistry through AP or honors courses.

Sincerely,

[Signature]

Trisha Folds-Bennett
Dean, Honors College
From: <Hillenius>, Willem Jacob <HilleniusW@cofc.edu>
Date: Monday, November 2, 2015 at 3:56 PM
To: "Riggs-Gelasco, Pamela Jo" <gelascop@cofc.edu>
Cc: "Morrison, Susan J" <MorrisonS@cofc.edu>
Subject: Re: Curriculum change

Hi Pam,
Sorry about the delayed response.

Biology's curriculum committee has looked over your proposed change to the Honors chemistry sequence, and finds no problem with it. We will discuss in the department whether an amendment of our chemistry requirement is warranted. Our current wording would not be materially affected by the proposed change of the Honors Chem sequence, since it does not specify a number of chemistry credits. I believe we're good to go, but we may decide to look under the hood to see if we can make it better.

However, the curriculum committee does ask whether and how Chemistry is changing its minor. Do you have any news from that program?

Thanks,
Jaap
-----
Jaap Hillenius
Professor & Chair
Department of Biology
College of Charleston
66 George Street
Charleston, SC 29424
From: <Hakim-Butt>, Karen L <hakimbuttkl@cofc.edu>
Date: Monday, September 21, 2015 at 9:45 AM
To: "Riggs-Gelasco, Pamela Jo" <gelascop@cofc.edu>
Subject: FW: Exercise Science Question

Good morning Pam,

Please see Bill Barfield's reply below (Bill is our program lead for EXSC). Let me know if you need anything further. Thanks for the heads-up.

KHB

Karen Hakim-Butt, Ed.D.
Associate Dean, School of Education, Health and Human Performance

From: "Barfield, William R" <BarfieldW@cofc.edu>
Date: Friday, September 18, 2015 6:15 AM
To: "Hakim-Butt, Karen L" <hakimbuttkl@cofc.edu>
Subject: Re: Exercise Science Question

Karen, in the 22 years I have been at cofc there has not been an exercise science student that this would affect.
My suggestion is to take on a case by case basis.
We might consider altering our curriculum if we push forward with certification.
Thanks.
Bill

Sent from my iPad

On Sep 17, 2015, at 10:49 PM, Hakim-Butt, Karen L <hakimbuttkl@cofc.edu> wrote:

Please review and advise. Thanks.
Subject: Re: Change to honors chemistry sequence  
Date:  Wednesday, October 28, 2015 at 7:43:43 AM Eastern Daylight Time  
From:  Colgan, Mitchell W  
To:  Riggs-Gelasco, Pamela Jo  
CC:  Hassard, Stacey K  

Dear Pam,

The Geology Department supports these changes.

Thank you for the suggested wording changes.

Mitchell

Chair  
Geology and Environmental Geosciences  
College of Charleston  
SSMB 224 · 202 Calhoun St. Charleston, SC 29401  
843-953-7171  
colganm@cofc.edu

On Oct 27, 2015, at 10:17 PM, Riggs-Gelasco, Pamela Jo <GelascoP@cofc.edu> wrote:

Mitch,

I mentioned to you last week that we are changing our honors sequence to have a single 5-credit course that covers the material in Chem 111 and Chem 112 (most of it---it will skip very basic things covered in Chem 111, since these students usually have AP credit for Chem 111 and sometimes 112 as well).

I think the statement below describes how it will affect Geology, except, maybe your department could decide to just require HONS 190 and no more chemistry..... I don't think we have very many Honors Geology students taking their honors sequence in Chemistry, but I could be wrong. Most will have AP credit for the traditional courses, so you almost don't have to change anything. My guess is that your honors students take that AP credit and don't take any chemistry here, whereas our students we suggest they retake the sequence, which is overkill for most of them, hence the new course to help them get through a review more quickly.

A couple of Geology courses (Geol 291 and Geol 250) require Chem 111 and these should be modified to indicate Chem 111 or HONS 190. The major in Geology indicates Chem 111 and Chem 112 OR Chem 111 and Geol 250. This should be modified to indicate Chem 111 and Chem 112, OR Chem 111 and Geol 250, OR HONS 190 and Geol 250.

Can you send me a note of acknowledgement if this all sounds fine. Happy to submit any change forms Geology needs if you or your department want me to submit it with mine. I think it would be 4 forms. I would just need to know if you want this rare student to take HONS 190 AND GEOL 250.

Pam
Subject: Support of HONS 190
Date: Thursday, December 3, 2015 at 3:36:30 PM Eastern Standard Time
From: van Delden, Sebastian A
To: Riggs-Gelasco, Pamela Jo

Dear Pam,

The computer science department enthusiastically supports the new HONS 190 course proposal that collapses two semesters of Gen chem into one 5-credit course. An accelerated Honors program will not affect a student achieving 15 credit hours in chemistry, counting towards our newly crafted Data Science with Science emphasis. Such an honors student/Data Science major with Science Emphasis would take

HONS 190 (5 credits: 4 lecture and 1 lab): HONS 192 (4 credits: 3 lecture and 1 lab): HONS 293 (4 credits: 3 lecture and 1 lab): Chem 351 and 311 (Both 3 credits no lab) = 19 credit hours

Exceeding the 15 credit hour requirement. For comparison, a non-honors student would need


So the Honors sequence actually makes it more probable a student would be able to complete this requirement in Chemistry.

Thank you so much Pam for all your hard work and all you do for our students!

Sebastian

Sebastian van Delden, Ph.D.
Department Chair and Professor

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