Instructions for Degree/Major Revisions:

- Complete this form when the proposed changes will impact the words, numbers, or symbols as presented in the current catalog copy (often referred to as "changing the footprint of the catalog"). Changes to Program Admission Requirements and Additional Graduation Requirements should also be included in this proposal.

- Catalog copy is available at http://www.fgcu.edu/catalog/. Scroll down to "Academic Programs" on the left navigation bar. Select Undergraduate Programs. Select the Program. Select "Print Program Details" in the upper right corner. Copy and paste catalog copy into a Word document. Turn on the tracking function (be sure that both additions and deletions appear in the tracking). Update the catalog year and make edits. Save the document as a Word file.

- When the proposed changes are approved by the College Curriculum Team, the College Administrator will send the following to Lucero Carvajal in Academic and Curriculum Support (ACS) no later than October 31 for review by the Undergraduate Curriculum Team (UUCT):
  - An electronic MS Word version of the tracked catalog via email.
  - A color hard copy of the Degree/Major Revision Proposal with appropriate signatures via campus mail.
  - An electronic MS Word version of a degree curriculum map showing prerequisites and sequencing for all courses via email.

- If changes are for courses only and there is no impact to the catalog copy, this revision form is not necessary. When these "stand-alone" courses have been approved by the College Curriculum Team and noted in CMS, the CMS College Administrator should send a list to Lucero Carvajal in ACS. The same October 31 deadline applies.

- All changes to courses are completed via the Curriculum Management System (CMS)
  https://midas.fgcu.edu/acadaff/scns/default.asp

- Reminder: The prefix/number for a new course is handled one way in the catalog copy and another in CMS. In the catalog copy, identify a new course with the suggested title, suggested prefix and course level, plus XXX (e.g., ART 4XXX). When final approval for the course prefix/number is received from Statewide Course Numbering System, the catalog copy will be updated. In CMS, a new course is requested by entering the suggested title and suggested prefix/number with no XXX. See instructions in CMS for selecting an appropriate suggested prefix/number.

1. **Degree/Major Title:** Chemistry BA
2. **Contact person:** Gregory McManus
   - **College:** CAS
   - **Department/School:** Chemistry & Physics
   - **Telephone:** 239-590-1469
3. **Briefly describe the proposed revision(s):**
   The Chemistry BA degree is being changed as follows:

   1. We are splitting the C designation for all required chemistry courses (Analytical Chemistry, Physical Chemistry, and Instrumental Analysis) into separate lecture and lab components. Additionally, in order to ensure that students are better prepared for Physical Chemistry we are adding Analytical Chemistry CHM 3120/L as a prerequisite the new Physical Chemistry lecture/lab courses.

   2. We are adding 2 new upper level elective courses: CHM 4170C Lasers in Physical Sciences and CHM 4512C Computational Modeling.

   3. We are adding laboratory components to 2 existing upper level elective courses: CHM 4220C Advanced Organic Chemistry and CHM 4714C Materials Chemistry.

Degree/MajorRevision Proposal – Revised – 6-29-16
4. We are moving ISC 3120C Scientific Process from our list of required course to the list of our restricted electives. As a result of this we are changing the prerequisites for CHM 4932 Chemistry Senior Seminar and CHM 4910C Senior Project in Chemistry.

5. Based upon feedback received from the American Chemical Society we are changing the prerequisite for CHM 4080C Adv. Environmental Chemistry.

6. The course description and student learning outcomes for CHM 1045L General Chemistry I lab are being updated to reflect the current content taught within the course.

4. Effective date: Fall 2017
Changes are effective in the fall of the year. Exceptions are approved only in unusual circumstances with adequate justification.

5. Briefly explain the rationale for the proposed revision.
Link the proposed revision to assessment and institutional effectiveness activities (feedback from students, market demands, program evaluation, resource allocation, etc.). Provide three years of data.

We have received feedback from the American Chemical Society (ACS) during our accreditation application that the department needs to have a clearer picture of laboratory hours. In addition, ACS stated that our laboratory courses need improved rigor. We have decided to split the C designation for all required chemistry courses into separate lecture and lab components. CHM 3120C Analytical Chemistry will become CHM 3120/L Analytical Chemistry lecture/lab. CHM 4139C Instrumental Analysis will become CHM 4130/L Instrumental Analysis lecture/lab. CHM 4139/L is not an appropriate course number for this instrumentation course according to the SUS course numbering system, we have selected CHM 4130/L as a more appropriate course number based upon other institutions within the SUS. CHM 3005C Phys Chem for Life Sciences will become CHM 3400/L Principles of Phys. Chem. lecture/lab. CHM 3005C is not an appropriate course number for a physical chemistry course according to the SUS course numbering system, we have selected CHM 3400/L as a more appropriate course number based upon other institutions within the SUS. Additionally, we are adding Analytical Chemistry CHM 3120/L as an additional prerequisite for this class which will help improve the rigor and more effectively prepare students for Physical Chemistry. These courses already have separately scheduled lecture and laboratory times so this change will have no effect on how we currently schedule these courses.

In an effort to strengthen the course offerings within our chemistry program we are adding 2 additional upper level elective courses within our Chemistry BA program. ACS pointed to a lack of computational chemistry content within our program and we are addressing this by adding CHM 4512C Computational Modeling as a new course to our list of restricted electives. The new CHM 4170C Lasers in Physical Sciences course will provide our students with the opportunity to take an upper level analytical chemistry elective which we are currently lacking.

We are adding a “C” designation to our CHM 4220C Advanced Organic Chemistry and CHM 4714C Materials Chemistry elective courses. The recent acquisition of new research grade instrumentation (i.e., NMR, GC-MS, Gas Sorption Analyzer, and an X-ray diffractometer) will allow the incorporation of labs into these courses which previously was not possible. The increased laboratory contact time provided through these elective courses will help towards satisfying ACS certification requirements.

We are moving ISC 3120C Scientific Process from our list of required courses to the list of our restricted electives. Given the content covered in the CHM 4932 Chemistry Senior Seminar course which we recently added to our Chemistry BA program, having both ISC 3120C and CHM 4932 as required courses is redundant in some areas. This will change the minimum number of credits for required courses in the major from 31 to 28 and the minimum number of credits for restricted elective courses from 9 to 12. Chemistry/Biochemistry students only account for a small percentage of the students enrolling in ISC 3120C so there should only be a small decrease in the enrollment in that course. Additionally, CAS has difficulty keeping up with the student demand for ISC 3120C so this change should help free up seats for students in other science majors who still require ISC 3120C. As a result of this we are changing the
prerequisites for CHM 4932 Chemistry Senior Seminar and CHM 4910C Senior Project in Chemistry to Analytical Chemistry lecture/lab and Organic Chemistry II lecture/lab.

The ACS accreditation committee recommended that the prerequisite for CHM 4080C Adv. Environmental Chemistry be higher than CHM 1046/L General Chemistry II lecture/lab so we are increasing the prerequisite to CHM 2210/L Organic Chemistry I lecture/lab.

The course description and student learning outcomes for CHM 1045L General Chemistry I lab are being updated to reflect the current content taught within the course. The current course description provides a list of experiments some of which are no longer utilized in our general chemistry course. ‘Measurement and accuracy in the laboratory’ is no longer a single experiment and is now incorporated into most experiments. Coligative properties are not a topic covered in any CHM 1045 course at FGCU and have not been covered in lab in at least 6 years. In addition, this list constrains the ability of faculty to develop and implement new experiments that could increase student understanding and experimental skills. The new course description focuses on key laboratory skills necessary for students to transition into CHM 1046L and allows faculty to develop new experiments. Finally, several CHM 1045 courses are no longer lecture based and so the language ‘lecture class’ is outmoded.

6. **Describe additional library resources needed to support this revision? Explain rationale for response, even if answer is None.**

   None, the existing library resources are sufficient.

7. **Describe additional faculty resources needed to support this revision? Explain rationale for response, even if answer is None.**

   None, these courses can be taught by our current faculty.

8. **Describe additional technology, facility, laboratory, or other resources needed to support this revision? Explain rationale for response, even if answer is None.**

   None, these courses already have separately scheduled lecture and laboratory times so this change will have no effect on how we currently schedule these courses.

9. **What impact will the proposed revision have on other colleges, units, or programs?**

   Please search current online catalog to determine if other colleges, units, or programs use courses that are part of this proposal and need to be notified of any changes.

   None

10. **New courses:**

    ☒ No new courses are required.

    ☐ New courses are needed. List prefix/number/title below. Complete a Course Add Form for each from the Curriculum Management System - [https://midas.fgcu.edu/acadaff/sens/](https://midas.fgcu.edu/acadaff/sens/).

    CHM 3120 Analytical Chemistry
    CHM 3120L Analytical Chemistry Lab
    CHM 3400 Principles of Phys. Chem.
    CHM 3400L Principles of Phys. Chem. Lab
    CHM 4130 Instrumental Analysis
    CHM 4130L Instrumental Analysis Lab
    CHM 4170C Lasers in Physical Sciences
    CHM 4512C Computational Modeling

11. **Change to existing courses:**

Degree/MajorRevision Proposal – Revised – 6-29-16
Florida Gulf Coast University  UNDERGRADUATE Degree/Major Revision Proposal

☐ No existing courses are being changed.
☒ Existing courses are being changed. List prefix/number/title below. Complete a Course Change Form for each from the Curriculum Management System - https://midas.fgcu.edu/acadaff/scns/.

CHM 1045L General Chemistry I Lab
CHM 4080C Adv. Environmental Chemistry
CHM 4220C Advanced Organic Chemistry
CHM 4714C Materials Chemistry
CHM 4910C Senior Project in Chemistry
CHM 4932 Chemistry Senior Seminar

12. Termination of existing courses:

☒ No existing courses are being deleted from the FGCU course inventory.
☐ Courses are being terminated. List prefix/number/title below. Complete a Course Terminate Form for each course from the Curriculum Management System - https://midas.fgcu.edu/acadaff/scns/.

13. What impact will the proposed revision have on the progression or sequencing of courses in this degree program?

Please provide evidence in the form of a degree curriculum map, a listing of all General Education, required and restricted elective courses in the major and their prerequisites or use another form appropriate for your program.

These revisions should have no impact on the scheduling of the required courses in our program. The chemistry program currently offers 2-4 upper level elective courses per year and will continue to ensure that each upper level elective course will be offered once every 2-3 years.

14. What impact will the proposed revision have on the progression or sequencing of courses in this degree program for current students?

Our students will be required to complete an additional restricted elective course instead of ISC 3120C Scientific Process. Our current students will be required to complete Analytical Chemistry and Organic Chemistry 2 prior to taking Chemistry Senior Seminar. Considering that our students take these courses during their sophomore/junior years this change should not have a significant effect on the progression or sequencing of courses for students in our program.

15. Catalog copy:

See Instructions above.

16. Additional remarks:

APPROVALS (required prior to submission)

Department/Program Chair/Director                                   Date 10/31/16
College Curriculum Committee Chair                                   Date 10/31/16
College Dean                                                        Date 10/31/16

Does another department or unit provide related expertise or offer similar courses? ☐ No ☑ Yes (If yes, have the other department complete the following. Attach a separate sheet if needed.)

Department/Unit:  ☐ Supports this proposal  ☐ Does not support this proposal  ☐ Defers Recommendation

Degree/MajorRevision Proposal – Revised – 6-29-16
Chemistry (B.A.)
College of Arts and Sciences
Department of Chemistry and Physics
http://www.fgcu.edu/CAS/ChemistryBA/index.asp
(239) 590-7196
2016-2017 Catalog Year

Program Admission Requirements

- Submit an FGCU Undergraduate Admission Application and satisfy all applicable university admission requirements.
- Complete common prerequisites with a grade of C or better.
- Attend an orientation session.
- Sign an Advising Agreement document.

Program Requirements

To prevent or minimize excess hours, select general education courses that satisfy common prerequisite requirements for your intended major.

1. FGCU General Education Program (http://www.fgcu.edu/general_education/)
2. Common Prerequisites
   A minimum grade of C is required in each course.

   FGCU Course: CHM 1045C General Chemistry I w/lab (4) or CHM 1045 (3) and CHM 1045L (1)
   Acceptable Substitute: (CHMX045 and CHMX045L) or (CHMX040 and CHMX041) or CHMX045C

   FGCU Course: CHM 1046C General Chemistry II w/lab (4) or CHM 1046 (3) and CHM 1046L (1)
   Acceptable Substitute: (CHMX046 and CHMX046L) or CHMX046C

   FGCU Course: CHM 2210C Organic Chemistry I (4) or CHM 2210 (3) and CHM 2210L (1)
   Acceptable Substitute: CHMX210C or (CHMX210 and CHMX210L)
FGCU Course: CHM 2211C Organic Chemistry II (4) or CHM 2211 (3) and CHM 2211L (1)
Acceptable Substitute: CHMX211C or (CHMX211 and CHMX211L)

FGCU Course: MAC 2311 Calculus I (4)
Acceptable Substitute: MACX311 or MACX281

FGCU Course: MAC 2312 Calculus II (4)
Acceptable Substitute: MACX312 or MACX282

FGCU Course: PHY 2048C General Physics I w/lab (4) or PHY 2053C College Physics I w/lab (4)
Acceptable Substitute: (PHYX048 and PHYX048L) or PHYX048C or (PHYX053 and PHYX053L) or (PHYX053C)

FGCU Course: PHY 2049C General Physics II w/lab (4) or PHY 2054C College Physics I w/lab (4)
Acceptable Substitute: (PHYX049 and PHYX049L) or PHYX049C or (PHYX054 and PHYX054L) or (PHYX054C)

3. **Required Courses in the Major (3428 credits)**
A minimum grade of C is required in each course.

BCH 3023C Biochemistry (3)
CHM 3005C Phys. Chem. for Life Sciences (4)
CHM 3120C Analytical Chemistry (4)
CHM 3120 Analytical Chemistry (3)
CHM 3120L Analytical Chemistry Laboratory (1)
CHM 3400 Principles of Phys. Chem. (3)
CHM 3400L Principles of Phys. Chem. Laboratory (1)
CHM 3610 Inorganic Chemistry (3)
CHM 3610L Inorganic Chemistry Laboratory (1)
CHM 4139C Instrumental Analysis (4)
CHM 4130 Instrumental Analysis (3)
CHM 4130L Instrumental Analysis Laboratory (1)
CHM 4931 Senior Capstone in Chemistry (3)
CHM 4932 Chemistry Senior Seminar (3)
IDS 3300 Foundations of Civic Engagement (3)
ISC 3420C Scientific Process (3)
4. **Restricted Electives in the Major** (minimum of 912 credits)
   A minimum grade of C is required in each course.

   - BCH 3025C Analytical Biochemistry (3)
   - BCH 4033C Advanced Biochemistry I (4)
   - BCH 4034C Advanced Biochemistry II (4)
   - CHM 3940 Internship in Chemistry (0-4)*
   - CHM 4080C Adv. Environmental Chemistry (3)
   - **CHM 4170C Lasers in Physical Sciences (3)**
   - CHM 4220C Advanced Organic Chemistry (3)
   - CHM 4230C Practical NMR Spectroscopy (3)
   - CHM 4300 Bio-Organic Chemistry (3)
   - CHM 4431 Statistical Thermodynamics (3)
   - **CHM 4512C Computational Modeling (3)**
   - CHM 4671 Bioinorganic Chemistry (3)
   - CHM 4714C Materials Chemistry (3)
   - CHM 4905 Dir Ind Study/Res in Chem (2-4)*
   - CHM 4910C Senior Project in Chemistry (2)*
   - CHM 4912C Senior Thesis/Pres. Chemistry (2)*
   - CHM 4930 Special Topics in Chemistry (2-4)
   - CHS 4533C Forensic Biochemistry (3)
   - CHS 4544C Forensic Chemistry (3)
   - **ISC 3120C Scientific Process (3)**

   *A maximum number of 4 credits combined from these courses can be used to fulfill the elective requirement.

5. **University Requirements (3 credits)**
   - IDS 3920 University Colloquium (3)

6. **Additional Electives** – as needed to reach total credits required for the degree

**TOTAL SEMESTER HOURS REQUIRED:** 120 HRS

**Additional Graduation Requirements**

- A minimum of 120 credits.
- A minimum of 48 of the 120 credits must be at the upper division (3000 - 4999) level.
- A cumulative GPA of 2.0 for all coursework attempted at FGCU.
- Satisfaction of the College-Level Skills and foreign language entrance requirements.
- Satisfaction of the Service Learning requirement (See www.fgcu.edu/connect).
- Satisfaction of the residency requirement: thirty of the last sixty credits must be completed at FGCU.
- Completion of the summer course enrollment requirement.
- Submit an online Application for Graduation via Gulfline by the deadline listed in the FGCU Academic Calendar.
# Bachelor of Arts in Chemistry

## Fall - Year 1

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC2311</td>
<td>Calculus I</td>
<td>4</td>
<td>MAC 1147 or MAC 2157 or ACU5 min. score of 087</td>
<td>F,S,SU</td>
</tr>
<tr>
<td>CHM 1045/L</td>
<td>General Chemistry I w/lab</td>
<td>4</td>
<td>MAC 1105, 1147, 2311, 2157, or ACU5 with minimum score of 066</td>
<td></td>
</tr>
<tr>
<td>AMH 2020 or ANT 2000 or ECO 2013 or POS 2041 or PSY 2012 or SYG 2000</td>
<td>State Core Gen Ed Requirement in Social Sciences</td>
<td>3</td>
<td>varies</td>
<td></td>
</tr>
<tr>
<td>ENC 1101</td>
<td>Composition I</td>
<td>3</td>
<td>A01 min. score of 17 or S01 min. score of 440 or ACU 1 min. score of 083 or ERT 1 min. score of 103</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits for Semester:** 14

## Spring - Year 1

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC 2312</td>
<td>Calculus II</td>
<td>4</td>
<td>MAC 2311</td>
<td>F,S,SU</td>
</tr>
<tr>
<td>CHM 1046/L</td>
<td>General Chemistry II w/lab</td>
<td>4</td>
<td>CHM 1045/L or CHM 1045C</td>
<td></td>
</tr>
<tr>
<td>ARH 2000 or HUM X200 or UT 2000 or MUL 2010 or PHI 1010 or THE 2000</td>
<td>State Core Gen Ed Requirement in Humanities</td>
<td>3</td>
<td>varies</td>
<td></td>
</tr>
<tr>
<td>ENC 1102</td>
<td>Composition II</td>
<td>3</td>
<td>Pre-req. ENC 1101</td>
<td></td>
</tr>
<tr>
<td>XXX-XXXX</td>
<td>General Education Course in Social Sciences**</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits for Semester:** 17

## Fall - Year 2

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 2048C</td>
<td>General Physics w/Lab I</td>
<td>4</td>
<td>Prerequisite MAC 2311</td>
<td>F,S,SU</td>
</tr>
<tr>
<td>STA 2023</td>
<td>State Core Math: Statistical Methods</td>
<td>3</td>
<td>MAT 1033 or MAC 1105 or MAC 1147 or MAC 2233 or MGF 1107 or MGF 1106 or S02 min. score of 550 or A02 min. score of 24 or ACU4 min. score of 090or ERT4 min. score of 123</td>
<td></td>
</tr>
<tr>
<td>CHM 2210/L</td>
<td>Organic Chem w/Lab I</td>
<td>4</td>
<td>CHM 1046/L or CHM 1046C</td>
<td>F,S,SU</td>
</tr>
<tr>
<td>XXX-XXXX</td>
<td>General Education Course in Humanities**</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits for Semester:** 17

## Spring - Year 2

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 2049C</td>
<td>General Physics w/Lab II</td>
<td>4</td>
<td>PHY 2048C and MAC 2312</td>
<td>F,S,SU</td>
</tr>
<tr>
<td>CHM 2211/L</td>
<td>Organic Chem w/Lab II</td>
<td>4</td>
<td>CHM 2210/L or CHM 2210C</td>
<td>F,S,SU</td>
</tr>
<tr>
<td>XXX-XXXX</td>
<td>Free Elective</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XXX-XXXX</td>
<td>General Education Course in Humanities**</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits for Semester:** 14

## NOTES:

- Assumes student arrives ready for Calculus I (MAC 2311) and Statistical Methods (STA 2023)
- Students must complete 6 hours of Intercultural Knowledge coursework (INKK) from within the Social Sciences, Humanities or Natural Sciences. Additionally to Composition I & II students will complete a additional 6 hours of College Level Writing Skills (CLWS) from within the Social Sciences or Humanities categories, or Colloquium with a "C" or higher.

For additional information, see: [http://www.fgcu.edu/CAS/ChemistryBA/7588.asp](http://www.fgcu.edu/CAS/ChemistryBA/7588.asp)
# Bachelor of Arts in Chemistry

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHM 3400/L</td>
<td>Principles of Phys. Chem.</td>
<td>4</td>
<td>CHM 2211/L or CHM 2211C, CHM 3120/L or CHM 3120C, MAC 2311, PHY 2049C or PHY 2054C</td>
<td>F</td>
</tr>
<tr>
<td>CHM 3120/L</td>
<td>Analytical Chemistry</td>
<td>4</td>
<td>CHM 1046/L or CHM 1046C</td>
<td>F,S</td>
</tr>
<tr>
<td>XXX 3XXX/4XXX</td>
<td>Upper Level Restricted Elective</td>
<td>3</td>
<td>see course description on Gufline</td>
<td>varies</td>
</tr>
<tr>
<td>XXX 3XXX/4XXX</td>
<td>Upper Level Restricted Elective</td>
<td>4</td>
<td>see course description on Gufline</td>
<td>varies</td>
</tr>
<tr>
<td>Total Credits for Semester:</td>
<td></td>
<td></td>
<td></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHM 4130/L</td>
<td>Instrumental Analysis</td>
<td>4</td>
<td>CHM 2211/L or CHM 2211C and CHM 3120/L or CHM 3120C</td>
<td>S</td>
</tr>
<tr>
<td>BCH 3023C</td>
<td>Biochemistry</td>
<td>3</td>
<td>CHM 2211/L or CHM 2211C</td>
<td>F,S,SU</td>
</tr>
<tr>
<td>XXX 3XXX/4XXX</td>
<td>Upper Level Restricted Elective</td>
<td>3</td>
<td>see course description on Gufline</td>
<td>varies</td>
</tr>
<tr>
<td>XXX XXXX</td>
<td>General Elective</td>
<td>2</td>
<td>see course description on Gufline</td>
<td>varies</td>
</tr>
<tr>
<td>IDS 3920</td>
<td>University Colloquium</td>
<td>3</td>
<td>Meets Communication Skills requirement</td>
<td></td>
</tr>
<tr>
<td>Total Credits for Semester:</td>
<td></td>
<td></td>
<td></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHM 3610/L</td>
<td>Inorganic Chemistry</td>
<td>4</td>
<td>CHM 1046/L or CHM 1046C</td>
<td>F</td>
</tr>
<tr>
<td>CHM 4932</td>
<td>Senior Seminar in Chemistry</td>
<td>3</td>
<td>CHM 2211/L or CHM 2211C and CHM 3120/L or CHM 3120C</td>
<td>F</td>
</tr>
<tr>
<td>IDS 3300</td>
<td>Foundations of Civic Engagement</td>
<td>3</td>
<td>MUST HAVE JUNIOR STANDING TO REGISTER ENC 1102 with grade of C or better</td>
<td></td>
</tr>
<tr>
<td>XXX 3XXX/4XXX</td>
<td>Upper Level Restricted Elective</td>
<td>4</td>
<td>see course description on Gufline</td>
<td>varies</td>
</tr>
<tr>
<td>Total Credits for Semester:</td>
<td></td>
<td></td>
<td></td>
<td><strong>14</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHM 4931</td>
<td>Senior Capstone in Chemistry</td>
<td>3</td>
<td>CHM 3400/L or CHM 3005C, AND CHM 4130/L or CHM 4130C both may be taken</td>
<td></td>
</tr>
<tr>
<td>ANY 3000-4999</td>
<td>Upper Level General Elective</td>
<td>3</td>
<td>Upper Level Electives</td>
<td></td>
</tr>
<tr>
<td>XXX 3XXX/4XXX</td>
<td>Upper Level Restricted Elective</td>
<td>3</td>
<td>see course description on Gufline</td>
<td>varies</td>
</tr>
<tr>
<td>XXX XXXX</td>
<td>General Elective</td>
<td>2</td>
<td>see course description on Gufline</td>
<td>varies</td>
</tr>
<tr>
<td>XXX XXXX</td>
<td>General Elective</td>
<td>3</td>
<td>see course description on Gufline</td>
<td>varies</td>
</tr>
<tr>
<td>Total Credits for Semester:</td>
<td></td>
<td></td>
<td></td>
<td><strong>14</strong></td>
</tr>
</tbody>
</table>

Total Credits for Degree: **120**

## Course Type
- General Education
- Common Prerequisites
- Strongly Recommended Gen Ed
- Required in the Major
- Restricted Electives
- University Requirement
- General Electives
**Note:** FGCU requires that students who enter with fewer than 60 semester hours of credit must enroll in a minimum of 9 semester credit hours of coursework during one or more summer sessions prior to graduation. Therefore any of the courses listed in the fall and spring semesters above may be completed during a summer session. The total credits for the degree still add up to 120.

<table>
<thead>
<tr>
<th>Summer</th>
<th>Course</th>
<th>Course Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Semester Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>XXX XXXX</td>
<td>Any Courses Listed Above</td>
<td>≥ 9</td>
<td>varies</td>
<td>Summer</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Students must take both organic chemistry and either general or college physics. One set will serve as a common prerequisite, the other set will serve as the required course in the major.

<table>
<thead>
<tr>
<th>University Core Curriculum</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Required Electives in the Major</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Department of Chemistry &amp; Physics</th>
<th>College of Arts and Sciences</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts in Chemistry</td>
<td>Florida Gulf Coast University</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4-Year Course Rotation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2019</td>
<td>Spring 2020</td>
</tr>
<tr>
<td>Fall 2020</td>
<td>Spring 2021</td>
</tr>
<tr>
<td>Fall 2021</td>
<td>Spring 2022</td>
</tr>
<tr>
<td>Fall 2022</td>
<td>Spring 2023</td>
</tr>
<tr>
<td>Fall 2023</td>
<td>Spring 2024</td>
</tr>
<tr>
<td>Fall 2024</td>
<td>Spring 2025</td>
</tr>
</tbody>
</table>
Dear Dr. Reilly:

The Committee appreciated the opportunity to talk with you and your colleagues concerning the application for ACS approval of the chemistry program at Florida Gulf Coast University. The discussion was very helpful to the members in gaining a better understanding of the department and its objectives. The university’s significant growth in the last decade has transformed the chemistry program with an increased number of majors and faculty. You and your colleagues are making excellent progress in the development of the chemistry program, and the Committee encourages you to continue your efforts.

However, certain aspects of the program are not yet in compliance with the ACS Guidelines. After evaluating all of the information available, the Committee decided to withhold approval because of the concerns described below.

- **Physical chemistry.** The course that is proposed for the foundation coverage in physical chemistry, Physical Chemistry for Life Sciences (CHM 3005C), must be strengthened. The course has little coverage of quantum mechanics, and the treatment of chemical equilibrium and electrochemistry appear to be more suited to an analytical chemistry course. The overall rigor of the classroom and the lab experience must be improved. The enclosed supplement describes the Committee expectations for course work in this area.

- **Laboratory experience.** The current laboratory experience does not meet the requirements for breadth in four of the five subdisciplines (analytical, biochemistry, inorganic, organic, and physical chemistry) and does not provide the minimum of 400 lab hours required for student certification. Within the currently required course work, coverage of inorganic and biochemistry laboratory is not sufficient. In addition, hands-on experience with mass spectrometers, atomic absorption, and electrochemistry equipment must be included in the instructional lab courses required for certification, not just in research.

- **Computational chemistry.** The course materials that were submitted do not provide much evidence that computational methods are incorporated into the curriculum. This coverage must be strengthened and integrated into some of the courses that would be required for certification.

- **In-depth courses.** The Committee agreed that Advanced Environmental Chemistry (CHM 4080C) and Forensic Chemistry (CHS 4544C) could not be counted as in-depth course work for ACS approval or student certification. Acceptable in-depth courses must build on foundation chemistry concepts. Exams and other assignments should require critical thinking and problem-solving skills. The department must be able to maintain the ability to teach four in-depth courses each academic year without CHS 4544C and CHM 4030C unless the content of those courses is strengthened.
• **Research reports.** According to the proposed plan for laboratory experience, undergraduate research would be used for 180 of the lab hours. In order to satisfy the requirements for laboratory hours or in-depth course work, comprehensive written reports must be required of the students, and a sample of these reports must be included in the application package.

In addition, the Committee suggests that the faculty place more emphasis on the development of student skills throughout the curriculum. From the information included in the application package, work with the chemical literature appears to occur only in the upper level courses. Laboratory exercises seem to be recipe-driven experiments that offer students little autonomy in experiment design.

The Committee believes that the chemistry program is moving in a very positive direction and has developed good plans for addressing some of the deficiencies identified in this letter. In order to move forward in the application process, the chemistry program must be teaching all coursework that is required for ACS approval. When you have made the necessary changes to your program, you should begin the approval process by submitting a new pre-application.

Please do not hesitate to contact me if you have any questions about the Committee's decision or the requirements for ACS approval.

Sincerely,

Cathy A. Nelson
Secretary
Committee on Professional Training

CAN/hdk

c: President Wilson G. Bradshaw

Enclosure: Physical Chemistry Supplement