ESF Course Proposal
Committee on Curriculum - ESF Faculty Governance
Office of Instruction & Graduate Studies

This course proposal form should be completed when introducing a new course or a revision of an existing course. The proposal will be reviewed by the Committee on Curriculum, or, in the case of minor revisions, will be approved administratively by the Associate Provost for Instruction.

This Course Proposal must be completed according to the guidelines provided in Course Proposal Form – Instructions and Guidance. Please see the last page of Course Proposal Form – Instructions and Guidance, for instructions on how this Course Proposal should be submitted to the Committee on Curriculum for review.

Date: Feb 15, 2021

1. Course Information:

1.1 Course Prefix and Number: FCH380
Course Title: Analytical Chemistry I
(If a new or renumbered course, please check with the Registrar regarding the use or reuse of the course number)

1.2 □ This is a New Course.
OR
☒ This is a Major Course Revision
OR
□ This is a Minor Course Revision

If this is a Course Revision, please see Course Proposal Form – Instructions and Guidance to determine if your revision is major or minor. Indicate below the reason(s) for the revision.

(Please check all that apply)

☐ Course Number/Division ☒ Learning Outcomes ☒ Institutional Resources
☒ Title ☒ Concepts, Content
☒ Credit hours ☒ Catalog Description
☐ Pre- or Co-requisite(s) ☒ Instructional Methods
☒ Format ☐ General Education
☐ General Education
☐ American History ☐ Humanities
☐ The Arts ☐ Mathematics
☐ Basic Communication ☐ Natural Sciences
☐ Other World Civilizations ☐ Social Sciences
☐ Western Civilization

Rev 05/09/2016
2. Proposer Need Statement:

2.1 Describe why this course (or course revision) is needed to meet current or proposed goals and outcomes of the program or College, and, if a revision, provide an explanation of and justification for the revision. I am proposing this revision to better differentiate between the lecture and laboratory portions of this course (when combined, this course was also FCH380). When combined, it is difficult to gauge whether the students are meeting the student learning outcomes for the lecture-based aspects of this class when over a third of their grade is dedicated to laboratory-based work and reports. The laboratory-based portion of the course is complementary to the lecture, but there is no formal overlap that requires the two to be offered using the same course number. The lecture portion of the course will keep the prior course identifier (FCH380) and the laboratory course will be offered as a new course with a new course identified (FCH 382). The lecture will remain at 2 hrs per week, so the revised course will be 2, rather than 3, credits.

2.2 List the pre-requisite or co-requisite courses (taught within the home department or taught by another department) and explain their relationship to the proposed course. Pre-requisite: General Chemistry I & II.

2.3 Explain the impact of this course in meeting the goals and outcomes of other Departments/programs (if any). I am proposing to separate the lecture and laboratory portions of a prior course (FCH380) into two distinctive courses rather than have them combined. FCH 380 will become lecture-based and a new course, FCH 382, will become the laboratory portion of the course. This should not change the goals and outcomes of the Chemistry or Biochemistry majors in the Chemistry department or any other departments in which students take this course.

2.4 If the proposed course is designed to fulfill SUNY General Education Requirements, the Associate Provost for Instruction must review this proposal to ensure that General Education Requirements will be met for the specified knowledge area (See Instructions and Guidance). Please provide an explanation of how this course fulfills SUNY General Education Requirements. NA

2.5 What are the staffing requirements (instructor, TA, Lab tech, etc.) for this course? If a new course, are there new staffing needs or are there adequate staff members already in place? If a revised course, are there additional staffing needs? No new staffing needs are required.

2.6 What Department (or extra-Department) resources are or will be made available to support the course or course revision? No additional resources beyond what is already available are needed.

2.7 Anticipated Enrollment (enter where applicable)

<table>
<thead>
<tr>
<th>Fall Semester:</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Semester:</td>
<td>0</td>
</tr>
<tr>
<td>Summer Semester:</td>
<td>0</td>
</tr>
</tbody>
</table>

2.8 Anticipated frequency of class meetings. 2 times per week
3. DETAILED COURSE DESCRIPTION

3.1 COURSE IDENTIFICATION AND FORMAT:

3.1.1 Course Prefix and Number: FCH380
3.1.2 Course Name: Analytical Chemistry I
3.1.3 Credit Hours: 2
3.1.4 Semester (check all that apply): Fall ☑ Spring ☐ Summer ☐
3.1.5 Format (check as appropriate): Lecture ☑ Online ☐ Lab ☐ Field ☐ Other ☐ (explain)
3.1.6 Contact hours per week: 2
3.1.7 Prerequisite(s) – if none, please enter "None" (Be specific, as Upper Division courses and Graduate courses will likely have some pre-requisite knowledge) Pre-requisite: General Chemistry I & II.

3.2 SCOPE:

3.2.1 Level of Instruction (check one, or two if a shared resource course):
   Lower Division ☐ Upper Division ☑
   Beginning Graduate ☐ Advanced Graduate ☐

3.2.2 Relation to curriculum or to other ESF or Syracuse University courses:
   a. Is this a required course? No ☐ Yes ☑.
      If Yes, please list the program(s) for which it is a requirement: Chemistry
   b. Is this an elective course within your department? No ☑ Yes ☐.
   c. Is enrollment in this course restricted? No ☐ Yes ☑.
      If Yes, please explain: NA
   d. Are other ESF or SU courses similar or identical to this course? No ☐ Yes ☑.
      If Yes, please identify the courses: CHE335
   e. Is this course a shared resource offering (i.e. is there a graduate or undergraduate concurrent offering)? No ☑ Yes ☐.
      If Yes, what is the course number of the concurrent offering? NA

3.3 STUDENT LEARNING OUTCOMES:

Identify the student learning outcomes associated with this course.

After successfully completing this course, the students should be able to:

1. Use basic statistics to report and graph analytical data, evaluate data for quality, and identify common types of error.

2. Describe the properties of aqueous solutions including the activity of ions and ionic strength.

3. Explain the underlying theoretical principles and important practical applications of chemical equilibrium in acid/base, complexometric, redox, and precipitation titrations.
4. Explain the underlying theoretical principles of electrochemistry including standard electrode potentials and the Nernst equation.

3.4 MAJOR CONCEPTS, PROCESSES or TOOLS:

Identify the course content and themes (e.g. Table of Contents) consistent with the learning domains and outcomes. This course will cover the following topics:

1. Volumetric glassware
2. Quality control
3. Basic statistics
4. Chemical equilibria
5. Activities/ionic strength
6. Polyprotic acids/bases
7. Buffers
8. Titrations (acid/base, EDTA, redox, precipitation)
9. Potentiometry and electrodes
10. Electrochemistry

3.5 INSTRUCTIONAL METHODS:

Identify the methods used to meet the course outcomes, as well as the principal instructional methods. This course will be taught using a combination of passive (i.e. lecturing) and active (i.e. group work, polling) learning. Student knowledge will be assessed through weekly homework assignments and three examinations. Students will be required to complete one open notes take-home exam in the beginning of the semester to help them refresh their content-based knowledge from the pre-requisite courses to better prepare them for this course.

3.6 CATALOG DESCRIPTION

Provide the course description using the precise format to be included in the ESF catalog (i.e. course number and title; format; brief description; semester(s) offered; and pre-/co-requisites). Please do not exceed 1000 characters.

FCH380 Analytical Chemistry I

Two hours of lecture per week. This course will cover how to use basic statistics to report analytical data, evaluate data for quality, and identify common types of error; the underlying theoretical principles and important practical applications of chemical equilibria in acid/base, complexometric, redox, and precipitation titrations; and solution behavior using electrochemical methods including potentiometry and ion-selective electrodes. Fall.
Pre-requisite: General Chemistry I & II.

3.7 COURSE HISTORY:

Provide the dates of prior approval of this course, and its revision history. November 4, 2011 was when the most recent course revision was completed.

3.7.1 Relationship to current ESF courses

This course is replacing a current ESF course  YES  NO

If NO, then proceed to section 4 below.

If YES, then provide below the number and name of the course to be deactivated and removed from the catalog once this course proposal has been approved:

Course Number (of the course to be replaced)
Course Name (of the course to be replaced)

If the course to be replaced is used by departments other than the department sponsoring this proposal, please indicate below which departments are affected and the date they were notified about the course replacement.

Department: Environmental Science  Date of Notification: Feb 15, 2021
Department: Environmental Biology  Date of Notification: Feb 15, 2021
Department: Chemical Engineering  Date of Notification: Feb 15, 2021
Department:  Date of Notification:
4. Institutional Impacts:

This section pertains to forecasting institutional resource needs to support the course or course revision. Provide clear statements regarding the needs and current availability (or absence) of resources. Note that, if this is a course revision, only the impacts of the revision should be included.

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Staffing needs:</th>
<th>Classroom resources (e.g. physical facilities in a laboratory, lecture hall, flexible space, academic computing):</th>
<th>Technology Resources:</th>
<th>Computing Resources (software licensing, hardware, access):</th>
<th>Library Resources (subscriptions, services):</th>
<th>Transportation Requirements (budget, fees, fleet vehicles):</th>
<th>Forest Properties or Field Practicum Facilities:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>No change (lecture hall)</td>
<td>No change</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

- **Staffing needs:**
  - 1

- **Classroom resources**:
  - No change (lecture hall)

- **Technology Resources**:
  - No change

- **Computing Resources**:
  - None

- **Library Resources**:
  - None

- **Transportation Requirements**:
  - None

- **Forest Properties or Field Practicum Facilities**:
  - None
5. Health and Safety Considerations:

Will any of the conditions or situations outlined below be present in association with the course? Yes / No

5.1. Will substances with any of the following properties be used during instruction: flammability, toxicity, corrosivity, reactivity, registered pesticide, legally controlled, or other characteristics with the potential to cause harm or injury? □ / ☒

5.2. Will any physical hazards be present during instruction? (e.g., machines that need safety guards; razor blades or syringes; compressed gases, etc.). □ / ☒

5.3. Will any biological hazards be present during instruction? (e.g., handling animals (rabies or hantavirus); cultures or stocks of infectious agents (fungal spores, viruses, bacteria, etc.). □ / ☒

5.4. Will any radiation hazards be present during instruction? (e.g., radioisotopes, X-rays, ultraviolet rays, lasers, etc.). □ / ☒

5.5. Will any electrical equipment that, due to its design, location, or method of use, pose any threat to safety during instruction? (Give considerable thought to electrical use outdoors, or any potentially wet location.). □ / ☒

5.6. Will there be any personal safety issues related to the class? (e.g., due to time of day or location, at the end of any organized class exercise, will students be in danger of physical assault, etc.). □ / ☒

5.7. Will any students be driving official state or research sponsored land or water vehicles during any class or instructional exercise? □ / ☒

5.8. Will any type of personal protective equipment be necessary during class exercises? (e.g., hard-hats, eye/face protection, hearing protection, hand/foot protection, lab coat, visibility clothing, etc.) □ / ☒

If the answer was “Yes” to any of the HEALTH AND SAFETY questions, please explain: NA

For lab and field courses to which all answers are “no”, you should explain that here, also. Normally, we would expect some safety precautions for such courses.NA
6. Coordination and Consultation

Emails/letters, as noted below and attached to this proposal, or signatures below, indicate that the affected departments, programs or units have been notified of this proposal and have had an opportunity to assess the impact of the proposal on their respective units.

Affected Academic Department(s) or Program(s) – other than the sponsoring department:

Environmental and Forest Biology/Biotechnology

Department/Program 1

Name of Chair/Program Director

Chair Signature

Date

Department/Program 2

Name of Chair/Program Director

Chair Signature

Date

Department/Program 3

Name of Chair/Program Director

Chair Signature

Date

[If more than three Departments/Programs, please continue on a separate page]

Other Units:

Associate Provost for Instruction & Dean of the Graduate School (for Gen Ed courses only)

Date

Or letter attached □

Registrar

Date

Or letter attached □

Library Director

Date

Or letter attached □

Computing and Network Services

Date

Or letter attached □

Physical Plant

Date

Or letter attached □

Forest Properties

Date

Or letter attached □

Environmental Health and Safety

Date

Or letter attached □
7. Proposer Information and Sponsoring Department Chair Affirmation:

Contact Person:

Name: Jaime Mirowsky  
Department: Chemistry

Email: jmirowsk@esf.edu  
Phone: 315-470-6850

This proposal has been reviewed and approved by the sponsoring Department. Affected departments have been notified and given the opportunity to provide feedback. Department resources are or will be made available to support the course, or a plan is in place to meet the resource needs as identified in the Institutional Impacts section of this proposal (see Section 4, above).

Name: ___________________________ Date: __________  
Department Chair (or designated curriculum representative)

Signature: ___________________________ Or letter attached □  
Department Chair (or designated curriculum representative)

8. Approvals:

_________________________________________ Date  
Curriculum Committee

_________________________________________ Date  
Faculty Governance

_________________________________________ Date  
Provost