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: February 26, 2018

1. Course Information:

1.1 Course Prefix and Number: FCH 584

   Course Title: Spectrometric Identification of Organic Compounds

   (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 ☐ Semester Offered

☐ Credit hours ☐ Catalog Description ☐ Course Inactivation

☐ Pre- or Co-requisite(s) ☐ Instructional Methods ☐ Course Reactivation

☐ Format ☐ General Education

1.3 General Education knowledge and skills area (if applicable): If none, check here ☒

☐ American History ☐ Humanities ☐ Other World Civilizations

☐ The Arts ☐ Mathematics ☐ Social Sciences

☐ Basic Communication ☐ Natural Sciences ☐ Western Civilization
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. The undergraduate version of this courses is currently taught as FCH 384. This proposal seeks to have a graduate level version as an official course. A graduate-level version of this course has been taught as a special topics course for several years. We will no longer be requiring FCH 384 in our undergraduate program; in fact, we will be dropping FCH 384 from the Catalog. The addition of another credit and the topic of 2-dimensional NMR makes the course unsuitable to be REQUIRED of undergraduate students. Undergraduate students will have the option to take FCH 584, which would fulfill one of their three required Professional Electives.

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. One year of organic chemistry. This is the same as the requirement for FCH 384, and is necessary for understanding the names and structures of the compounds which are to be identified by their spectra.

2.3 Explain the impact of this course in meeting the goals and outcomes of other Departments/programs (if any). none

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. N/A

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 requirements.

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

2.7 Anticipated Enrollment (enter where applicable)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Number</th>
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<tr>
<td>Fall Semester</td>
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<td>Spring Semester</td>
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<td>Summer Semester</td>
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2.8 Anticipated frequency of class meetings. 3 times per week
3. DETAILED COURSE DESCRIPTION

3.1 COURSE IDENTIFICATION AND FORMAT:

3.1.1 Course Prefix and Number: FCH 584
3.1.2 Course Name: Spectrometric Identification of Organic Compounds
3.1.3 Credit Hours: 3
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: 3
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) One year of organic chemistry

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: BS/MS in Chemistry (to be proposed)
   b. Is this an elective course within your department?  No ☐ Yes ☒
   c. Is enrollment in this course restricted?  No ☒ Yes ☐
      If Yes, please explain:
   d. Are other ESF or SU courses similar or identical to this course?  No ☐ Yes ☒
      If Yes, please identify the courses: CHE 575 Organic Spectroscopy is a 3-credit SU course with very similar content, but it lacks the focus on natural products.
   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?

3.3 STUDENT LEARNING OUTCOMES:

Identify the student learning outcomes associated with this course. After completing this course, students will be able to:

1) Interpret 1H NMR spectra to deduce chemical structures

2) Interpret 13C NMR spectra for carbon skeletal information

3) Analyze infrared spectra for the presence of common functional groups

5) Determine molecular mass and selected fragments of organic compounds from the analysis of mass spectra
6) Interpret 2-dimensional NMR spectra to solve structure problems than cannot be solved by the combination of ordinary proton NMR plus 13C NMR

7) Synthesize information from multiple types of spectroscopy to specify the complete molecular structures of organic compounds, especially natural products

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. Major concepts include: functional groups of organic compounds, inductive effects; energy levels of molecular vibrations, electronic states, and nuclear spin; splittings in NMR spectra

Tools include spectra of actual organic compounds or listings of positions of major peaks of actual organic compounds.

3.5 **INSTRUCTIONAL METHODS:**

Identify the methods used to meet the course outcomes, as well as the principal instructional methods. Lecture and discussion, along with homework and exams.

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. Three hours of lecture and discussion per week. The first-half semester will deal with common classes of organic compounds; the second-half semester will deal with more complex structures and introduce 2-dimensional NMR techniques. The use of complementary information from mass, infrared, nuclear magnetic resonance and ultraviolet spectrometry will be applied to identification of organic natural products. Fall.

Prerequisites: One year of Organic Chemistry.

3.7 **COURSE HISTORY:**

Provide the dates of prior approval of this course, and its revision history. Previously taught as a Special Topics course in conjunction with FCH 384.

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)  FCH 384
Course Name (of the course to be replaced)  Spectroscopic Identification of Organic Compounds

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:  Date of Notification:
Department:  Date of Notification:
Department:  Date of Notification:
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.

Staffing needs: No additional

Classroom resources (e.g. physical facilities in a laboratory, lecture hall, flexible space, academic computing):

lecture hall with blackboard, document camera, computer, internet connection, and computer projector

Technology Resources: None

Computing Resources (software licensing, hardware, access): None

Library Resources (subscriptions, services):

None additional (ESF currently subscribes to several journals with wide coverage of chemistry and additional journals specializing in organic chemistry and/or natural products)

Transportation Requirements (budget, fees, fleet vehicles):

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:

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.
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:**

<table>
<thead>
<tr>
<th>Department/Program 1</th>
<th>Name of Chair/Program Director</th>
<th>Or letter attached □</th>
<th>Date</th>
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<th>Name of Chair/Program Director</th>
<th>Or letter attached □</th>
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<tr>
<th>Department/Program 3</th>
<th>Name of Chair/Program Director</th>
<th>Or letter attached □</th>
<th>Date</th>
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<td>Chair Signature</td>
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[if more than three Departments/Programs, please continue on a separate page]

**Other Units:**

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<th>Unit</th>
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<th>Date</th>
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<tr>
<td>Associate Provost for Instruction &amp; Dean of the Graduate School (for Gen Ed courses only)</td>
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<td>Registrar</td>
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7. Proposer Information and Sponsoring Department Chair Affirmation:

Contact Person:
Name: Francis Webster ____________________________
Department: Chemistry ____________________________
Email: fwebster@esf.edu ____________________________
Phone: 6863 ____________________________

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: Theodore S. Dibble ____________________________ Date: 3/6/2018 ______
Department Chair (or designated curriculum representative)
Signature: __________________________________________ Or letter attached ☑
Department Chair (or designated curriculum representative)

8. Approvals:

_________________________ ___________________________
Curriculum Committee Date

_________________________ ___________________________
Faculty Governance Date

_________________________
Provost Date