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 18, 2021

1. Course Information:

1.1 Course Prefix and Number: ERE 564
Course Title: i-Tree Tools Practicum
(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.

☑ This is a Major Course Revision
☑ 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. This course will:

a) satisfy the Environmental Resources Engineering (ERE) graduate program Ecological Engineering option for areas of competence: 1) ecosystem restoration and 2) modeling.
b) satisfy the upper division Engineering Elective requirement within the BS in ERE program;
c) meet ERE program outcomes #1 (solve complex problems applying principles of science, engineering, mathematics), #2 (apply engineering design), #3 (communicate effectively).

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-requisites:

a) EFB101, general biology to understand the basics of plant physiology and ecosystems,
b) FCH150, general chemistry to understand chemicals and pollutants in the environment;
c) APM104, algebra to understand how functions can be written to predict changing conditions.

2.3 Explain the impact of this course in meeting the goals and outcomes of other Departments/programs (if any). This course can optionally be used to:

a) satisfy the "tools and concepts that are commonly used in Ecosystems: Land, Water and Atmosphere Study Area" of the ESF Graduate Program in Environmental Science, as listed at https://www.esf.edu/environmentalscience/gpes/elwa.htm
b) meet ESF BS in Environmental Science program outcomes #4 (unifying principles), #7 (systems approach), and #6 (communicate effectively). This was coordinated with Prof. Russ Briggs.

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.

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? An existing ERE faculty member will serve as instructor to teach this course. There are no new staffing needs.

2.6 What Department (or extra-Department) resources are or will be made available to support the course or course revision? The Department of Sustainable Resource Management has an Equipment Room, operated by the Instructional Support Technician, that the course would like to use to have students sign out forest mensuration equipment, which includes DBH tape, measuring tape, and clinometer.

2.7 Anticipated Enrollment (enter where applicable)
2.8 Anticipated frequency of class meetings. Lecture will be given once per week. This creates a 3 hr block of time that enables practicum level engagement in visiting field sites and working with computer models.
3. DETAILED COURSE DESCRIPTION

3.1 COURSE IDENTIFICATION AND FORMAT:

3.1.1 Course Prefix and Number: ERE 564
3.1.2 Course Name: i-Tree Tools Practicum
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) I
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) EFB 101 general biology, FCH 150 general chemistry, APM 104 algebra

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:
   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:
   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. Upon completing this course, students will be able to:

1. Describe how mathematical models represent the scientific principles governing how urban forest cover affects human wellbeing;

2. Inventory urban forests using data gathered from field, imagery, archives, and models;

3. Quantify with science-based mathematical models the ecosystem services provided by the urban forest;

4. Engage the engineering design process by creating an urban forest system that is useful in improving urban sustainability and address constraints;
5. Create reports to explain your urban forest inventory and design scenario findings.

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. The course content includes:

Determine how models represent the urban forest structure and functions, and how ecosystem services are estimated, and critique strengths and weaknesses of the modeling approach

Collect & organize field data on urban forest characteristics using Oakwood Cemetery or similarly accessible property: i-Tree Eco

Estimate with models present urban forest ecosystem services & benefits related to air-quality, CO2 sequestration, stormwater avoided, building energy use needs: i-Tree Eco & i-Tree Design

Access archived remotely sensed data on current trees and priority planting sites: Estimate with models tree ecosystem services & benefits related to air-quality, CO2 sequestration, stormwater avoided use needs: i-Tree Landscape

Estimate with data analysis tools tree cover & other land cover using photo-interpretation as well as estimation of benefits related to air-quality & CO2 sequestration: i-Tree Canopy;

Review and prioritize tree species from digital databases to deliver prioritized ecosystem services, related to air-quality & CO2 sequestration, stormwater avoided, building energy use needs: i-Tree Species & Planting;

Access & organize remote or in-situ data on weather, terrain elevation, & land cover for site; Estimate with models tree ecosystem services & benefits related to stormwater volume & water quality pollution: i-Tree Hydro Green Infrastructure.

Estimate with models tree ecosystem services & benefits related to urban heat island: i-Tree Cool Air

Project practicum time

3.5 INSTRUCTIONAL METHODS:

Identify the methods used to meet the course outcomes, as well as the principal instructional methods. Instructor will use lecture and demonstration in field and computer lab to guide students in proficiency with i-Tree Tools, so they complete a training practicum and meet the course outcomes.

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 field demonstration per week.
Use i-Tree models to complete an urban forest inventory, an assessment of associated ecosystem services, and engineering designs for improved sustainability. Forest structure data are obtained from field visits and remotely sensed or archived products. Models simulate structure-function relations using governing scientific principles in order to estimate forest services such as filtering air pollution, sequestering carbon dioxide, managing stormwater, mitigating the urban heat island, and improving building energy use efficiency. Prerequisites: EFB 101 general biology, FCH 150 general chemistry, APM 104 algebra

3.7 COURSE HISTORY:

Provide the dates of prior approval of this course, and its revision history. N/A

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: 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.

<table>
<thead>
<tr>
<th>Staffing needs:</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom resources (e.g. physical facilities in a laboratory, lecture hall, flexible space, academic computing):</td>
<td>Computer lab</td>
</tr>
<tr>
<td>Technology Resources:</td>
<td>DBH tape, Measuring Tape, Clinometer equipment signed out from Department of Sustainable Resource Management Equipment Room</td>
</tr>
<tr>
<td>Computing Resources (software licensing, hardware, access):</td>
<td>i-Tree Tools free software installed on ESF computers</td>
</tr>
<tr>
<td>Library Resources (subscriptions, services):</td>
<td>N/A</td>
</tr>
<tr>
<td>Transportation Requirements (budget, fees, fleet vehicles):</td>
<td>N/A</td>
</tr>
<tr>
<td>Forest Properties or Field Practicum Facilities:</td>
<td>N/A</td>
</tr>
</tbody>
</table>
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: Students will be working on the Syracuse, NY property of the ESF campus or the adjoining land, such as Oakwood Cemetery, to measure tree and shrub data surrounding buildings, and hence be exposed to potential hazards inherent in working in nature. Students will be expected to follow best practices to mitigate potential hazards.

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:

Sustainable Resources Management___________________________________________________  Chris Nowak

Department/Program 1

__________________________
Name of Chair/Program Director

___________ Or letter attached ☑

Chair Signature

Date

Department/Program 2

__________________________
Name of Chair/Program Director

___________ Or letter attached ☐

Chair Signature

Date

Department/Program 3

__________________________
Name of Chair/Program Director

___________ Or letter attached ☐

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
7. Proposer Information and Sponsoring Department Chair
Affirmation:

Contact Person:

Name: Theodore Endreny
Department: ERE
Email: te@esf.edu
Phone: 315-470-6565

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:

______________________________ ____________ ______
Curriculum Committee
Date

______________________________ ____________ ______
Faculty Governance
Date

______________________________ ____________ ______
Provost
Date