N. C. STATE UNIVERSITY
UNIVERSITY UNDERGRADUATE CERTIFICATE PROGRAM FORM

COLLEGE/DEPARTMENT/PROGRAM NAME: College of Agriculture and Life Sciences/Plant and Microbial Biology
College of Natural Resources/Forestry and Environmental Resources

TYPE OF PROPOSAL:
New: ☒
Revision: ☐
Discontinuation: ☐

CERTIFICATE TITLE:
Undergraduate Certificate in Field Botany

CIP DISCIPLINE#: 23.0301

PROPOSED OR CURRENT PROGRAM CODE: 11FBOCTU

CERTIFICATE TYPE: On-campus ☒ Distance ☐ On-campus & Distance ☐

PROPOSED EFFECTIVE DATE: Fall 2018

ATTACHMENTS TO BE INCLUDED:
☒ Statement of Justification for Program
☒ Statement of Program Objectives
☐ Proposed Revision(s) with Reasons
☒ List of Program Requirements (use attached Format B)
☒ Catalog Description of Proposed Certificate
☐ Number of Certificate recipients in the past Five Years
☒ Projected Enrollment
☒ Admission Requirements
☐ Statement on Other Departments Likely to be Affected and Summary of Consultations with those Departments
☒ Signature Page
☒ Routing Form

APPROVED EFFECTIVE DATE:
North Carolina State University

This request to establish or discontinue a University Undergraduate Certificate Program or change the Title for an Existing Certificate Program has been reviewed and approved by the appropriate campus committees and authorities.

Undergraduate Certificate in Field Botany
Title of Certificate

Endorsed By:  
[Signature]
Head, Department/Program
Date 1/4/18

Recommended By:  
[Signature]
Chair, College Curriculum Committee
Date 2/7/18

Endorsed By:  
[Signature]
College Dean
Date 2/14/18

Recommended By:  
[Signature]
Vice Provost, DELTA (if DE degree or certificate)
Date

Recommended By:  
[Signature]
Chair University Courses and curriculum Committee
Date 3/14/18

Approved By:  
[Signature]
Dean of Undergraduate Academic Programs
Date 3/14/18

Recommended By:  
[Signature]
Dean's Council
Date 8/23/18

Approved By:  
[Signature]
Provost
Date 6/23/18

Approved By:  
[Signature]
Chancellor
Date 9/25/18
Proposal to Develop an Undergraduate Certificate in Field Botany
17 November 2017

1. Statement of Justification for Program. As the population of the United States and the world increases, the need for management and sustainable use of vascular plant ecosystems becomes increasingly important. A major component of management is plant identification, because all management plans must be tailored to the affected plants. Plant identification is also critical to satisfy the requirements of several mandatory state and federal programs, including wetland delineation, environmental impact statements, environmental planning reports, and conservation of rare plants. Unfortunately, recent studies have shown that agencies are suffering from insufficient expertise in field botany. In a recent survey, botanists in the federal government chose lack of staff with appropriate botanical training as one of the top three resources limiting their agency and 90% indicated they did not have enough botanically trained staff to meet their needs (Kramer et al. 2010). Students completing the Certificate in Field Botany will find the certificate very helpful in securing employment with the U. S. Army Corps of Engineers (protecting wetlands), private consulting firms (preparing impact statements and planning reports), the U. S. Fish and Wildlife Service (conserving threatened and endangered plants), Natural Heritage Programs (conserving rare plants), and private conservation organizations.

The proposed suite of four courses for the Certificate in Field Botany (see Format B and Table 1 below) is currently not required in any major or minor, or any other certificate program at N. C. State University, indicating unmet need. Although three of the four required courses are found among the 14 elective courses in the Plant Biology minor, no duplication exists because a student could earn the Plant Biology minor without taking any of the courses required in the Field Botany certificate. Furthermore, the fourth course (FOR 339, Dendrology) is not found among the Plant Biology minor electives. Thus, the proposed certificate does not duplicate any other program at N. C. State University.

The proposed certificate meets the University’s strategic plan goal #3 to “...address the major challenges that confront the world,” and goal #5 “...to be locally responsive to the needs of our community and state...” It meets the College of Agriculture and Life Sciences’ strategic theme #2 to “ensure environmental stewardship and sustainability of air, land, soil and water resources.” It meets the College of Natural Resources’ strategic goal #5 to “...create positive change and contribute to ecological and socioeconomic sustainability.”


2. Statement of Program Objectives/Outcomes. The objectives of this certificate are to prepare students to be centrally involved in the sustainable management of vascular plant ecosystems. After completing the certificate requirements, students will be (1) able to identify about 300 vascular plant species by sight, using the scientific name, botanical family and common name, (2) able to use plant identification keys, (3) fluent in domain specific terminology, and (4) familiar with species-site relationships.
3. **Proposed Revisions.** Not applicable.

4. **List of Program Requirements.** The certificate requires four courses, a total of 14 semester credit hours. The proposed coursework is shown in Format B and Table 1. Students must earn a grade of C- or better in all four required courses. No other requirements or time limits exist. Three of the required courses have PB 200 as a prerequisite. A prerequisite of PB 200 should not be problematic for students, because it is commonly required in agricultural, forestry, life science, and natural resource disciplines.
## CURRICULUM REQUIREMENTS

### Format B

<table>
<thead>
<tr>
<th>Degree/Plan Title:</th>
<th>Undergraduate Certificate in Field Botany</th>
<th>Plan SIS Code:</th>
<th>11FBOCTU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration/Subplan Title:</td>
<td></td>
<td>Subplan SIS Code:</td>
<td></td>
</tr>
<tr>
<td>Indicate requirements status:</td>
<td>Current:</td>
<td>Proposed:</td>
<td>X</td>
</tr>
<tr>
<td>New Degree Audit required? (Y or N)</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Critical Path Courses
Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.

### MAJOR FIELD OF STUDY REQUIREMENTS:

<table>
<thead>
<tr>
<th>Required Courses/Groups/ Electives:</th>
<th>Credit Hours</th>
<th>GEP category, if applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.</td>
<td></td>
<td>List GEP category and hours satisfied by a Major requirement</td>
</tr>
<tr>
<td>PB 220, Local Flora (C wall)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FOR 339, Dendrology (C wall)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PB 403, Systematic Botany (C wall)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PB 464, Rare plants (C wall)</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

#### Concentration Courses/Groups/Electives:
None

#### Free Electives:
None

### Total credit hours under Major Field of Study:
Minimum 27 hours required in program area. 14 hours

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Table 1. Proposed course work for Certificate in Field Botany.

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Title</th>
<th>Credits</th>
<th>Course Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB 220</td>
<td>Local Flora</td>
<td>3</td>
<td>PB 200 or BIO 181</td>
</tr>
<tr>
<td>FOR 339</td>
<td>Dendrology</td>
<td>4</td>
<td>None</td>
</tr>
<tr>
<td>PB 403</td>
<td>Systematic Botany</td>
<td>4</td>
<td>PB 200 or PB 250 or BIO 183</td>
</tr>
<tr>
<td>PB 464</td>
<td>Rare Plants</td>
<td>3</td>
<td>PB 200 or PB 220 or PB 403 or PB 405</td>
</tr>
</tbody>
</table>
5. **Catalog Description.** The Certificate in Field Botany will provide the opportunity to develop skills in vascular plant identification, through both sight recognition and use of taxonomic keys, and knowledge of domain specific terminology. The certificate requires 14 hours of traditional course work in four courses. The certificate is a non-degree program offered jointly by the Department of Plant and Microbial Biology (PMB) and Department of Forestry and Environmental Resources through on-campus classroom instruction, but is administered by PMB. It is available to students pursuing an undergraduate degree in any major at N. C. State University or to Non-Degree Studies (NDS) students. Students who have earned an undergraduate degree may also return as NDS students to complete the certificate. Students completing the certificate will find it very helpful in securing employment with the U.S. Army Corps of Engineers (protecting wetlands), private consulting firms (preparing impact statements and planning reports), the U.S. Fish and Wildlife Service (conserving threatened and endangered plants and improving wildlife habitat), Natural Heritage Programs (conserving rare plants), and private conservation organizations.

6. **Number of Certificate Recipients in the Previous Five Years.** Not applicable.

7. **Projected Enrollment.** Based upon enrollments in both PB 220 (Local Flora) and FOR 339 (Dendrology) over the last four years, we anticipate an initial enrollment of 8-10 students per year. We hope to grow this enrollment to 15-20 students within five years.

8. **Admission Requirements.** Students must be enrolled in an undergraduate degree at N. C. State University or as a Non-Degree Studies student (NDS).

Certificate coordinator: Dr. Alexander Krings, 2109 Gardner Hall, Box 7612, 919-515-2700, akrings@ncsu.edu.

9. **Statement on Other Departments Likely to be Affected.** Not applicable.

10. **Signature Page (see attached).**

11. **Routing Form (see attached).**