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| For Academic Affairs and Research Use Only | |
| Proposal Number | AGRI16 |
| CIP Code: |  |
| Degree Code: |  |

**New or Modified Course Proposal Form**

**[x] Undergraduate Curriculum Council**

**[ ] Graduate Council**

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| **[x]New Course, [ ]Experimental Course (1-time offering), or [ ]Modified Course (Check one box)** |

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

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| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date… **Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **COPE Chair (if applicable)** |
| Donald Kennedy 10/28/2021 **Department Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Head of Unit (if applicable)** |
| J Kim Pittcock 10/28/2021  **College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Undergraduate Curriculum Council Chair** |
| Mary Elizabeth Spence 10/19/2021 **Office of Assessment (new courses only)** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Graduate Curriculum Committee Chair** |
| Mickey Latour 10/28/2021 **College Dean** | Alan Utter 11/16/2021  **Vice Chancellor for Academic Affairs** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **General Education Committee Chair (if applicable)** |  |

1. **Contact Person (Name, Email Address, Phone Number)**

Steven Green, sgreen@astate.edu, 972-3463

1. **Proposed starting term and Bulletin year for new course or modification to take effect**

Summer 2022 start; 2022-2023 bulletin

**Instructions:**

*Please complete all sections unless otherwise noted. For course modifications, sections with a “Modification requested?” prompt need not be completed if the answer is “No.”*

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|  | **Current (Course Modifications Only)** | **Proposed (New or Modified)**  *(Indicate “N/A” if no modification)* |
| **Prefix** |  | **PSSC** |
| **Number\*** |  | **4733** |
| **Title** |  | **Soil Morphology and Classification (short title: Soil Morph and Class)** |
| **Description\*\*** |  | Field-based course to develop knowledge and skills in pedological principles and practices. Relationships among soil genesis, morphology, and land use will be emphasized. Students will visit numerous sites throughout Arkansas that show major soils in various ecosystems. |

***\**** (Confirm with the Registrar’s Office that number chosen has not been used before and is available for use. For variable credit courses, indicate variable range. *Proposed number for experimental course is 9*. )

\*\*Forty words or fewer as it should appear in the Bulletin.

1. **Proposed prerequisites and major restrictions** **[Modification requested? Yes/No]**

(Indicate all prerequisites. If this course is restricted to a specific major, which major. If a student does not have the prerequisites or does not have the appropriate major, the student will not be allowed to register).

1. **YES** Are there any prerequisites?
   1. If yes, which ones?

PSSC 1303 (Intro Plant Science) and PSSC 2813 (Soils)

* 1. Why or why not?

These courses provide general background needed for understanding soil and plant relations and dynamics.

1. **NO** Is this course restricted to a specific major?
   1. If yes, which major? Enter text...
2. **Proposed course frequency [Modification requested? Yes/No]**

(e.g. Fall, Spring, Summer; if irregularly offered, please indicate, “irregular.”) *Not applicable to Graduate courses.*

Summer (May Interim)

1. **Proposed course type [Modification requested? Yes/No]**

Will this course be lecture only, lab only, lecture and lab, activity (e.g., physical education), dissertation/thesis, capstone, independent study, internship/practicum, seminar, special topics, or studio? Please choose one.

Other: Experiential Learning (Confirmed this option with registrar on 20 Oct 2021)

1. **Proposed grade type [Modification requested? Yes/No]**

What is the grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental, or other [please elaborate])

Standard letter

1. **YES** Is this course dual-listed (undergraduate/graduate)? PSSC 5733
2. **NO** Is this course cross-listed?

*(If it is, all course entries must be identical including course descriptions. Submit appropriate documentation for requested changes. It is important to check the course description of an existing course when adding a new cross-listed course.)*

**a.** – If yes, please list the prefix and course number of the cross-listed course.

Enter text...

**b.** – **Yes / No** Can the cross-listed course be used to satisfy the prerequisite or degree requirements this course satisfies?

Enter text...

1. **NO** Is this course in support of a new program?

a. If yes, what program?

Enter text...

1. **NO** Will this course be a one-to-one equivalent to a deleted course or previous version of this course (please check with the Registrar if unsure)?

a. If yes, which course?

Enter text...

**Course Details**

1. **Proposed outline** **[Modification requested? Yes/No]**

(The course outline should be topical by weeks and should be sufficient in detail to allow for judgment of the content of the course.)

This course includes a multi-day field trip throughout the state of Arkansas. Learning will take place in the field in a hands-on environment while visiting 22 different sites across Arkansas that exhibit different soil formation and ecosystem properties. This portion will include in-field skills assessments. A written report, describing each of the field sites, will be required. The field portion of the course will consist of 4 to 5 site visits each day with approximately 7 contact hours on each of 5 days (each of the 22 site visits will take an average of 1.5 hrs on site; 35 contact hours in the field) along with 5 hrs of lecture prior to the field trip and 5 hrs of lecture post field trip.

Topics covered will include:

**Session 1: Pedological Principles I**

* + Soil morphological features and description
  + Landscapes and soil geomorphology

**Session 2: Pedological Principles II**

* + Soil parent materials and process of soil formation
  + Mineral weathering

**Session 3: Soil Classification I**

* Structure of Soil Taxonomy

**Session 4: Soil Classification II**

* Diagnostic horizons and features
* Nomenclature

**Session 5: Redoximorphic Features, Hydric Soils, Wetlands I**

* Redox chemistry and redoximorphic feature formation
* Field indicators of hydric soils

**Session 6-10 will be in the field:** students will take what they learned in lecture/readings from sessions 1-5 and identify these features in the field. They will classify soils using the Soil Taxonomy key. They will discuss, in teams, the thought processes used in determining classification and in identifying features and then share with the group.

**Session 6: Field day I**

* Mississippi River oxbow lake
* Mound City site
* Sharkey soil- high shrink swell features

**Session 7: Field Day II**

* Parkin Mounds
* Dundee soil
* Crowley’s Ridge- loess parent material
* Kenneth Gray Prairie- prairie soils exhibiting high topsoil organic matter
* Coastal Plain Bluff- loess parent material and fragipan features

**Session 8: Field Day III**

* Warren Prairie
* Alaga soil- sandy soil developed on marine terrace
* Cahaba soil- coastal plain river terrace
* Sand Pit- landscapes and soil formation affecting land use

**Session 9: Field Day IV**

* Ironstone features (near Camden
* Plinthite features (near Camden)
* Vertisols soil order near Hope- black, shrink-swell soils
* Secondary carbonates features (near Hope)
* Ironstone features (near DeQueen)

**Session 10: Field Day V**

* Ouachita Mountains land forms
* University of Arkansas Bumpers Research Farm agroecosystems (Booneville)
* University of Arkansas Research Farm (Fayetteville)- landforms affecting land use
* Baker Prairie (near Harrison)- prairie derived soils in the hill country
* Fontaine-sand dunes (eolian parent material)

**Session 11: Redoximorphic Features, Hydric Soils, Wetlands II**

* Interpretation of hydrologic and redox data

**Session 12: Carbon and Nutrient Cycling; Nutrient Management I**

* + Nitrogen, Phosphorus, Sulfur cycles
  + Phosphorus index

**Session 13: Carbon and Nutrient Cycling; Nutrient Management II**

* + Greenhouse gases (C, N2O, CH4, etc.)

**Session 14: Soil Quality/Soil Health/Soil Erosion I**

* Aggregate stability and surface crusting
* Infiltration and runoff

**Session 15: Soil Quality/Soil Health/Soil Erosion II**

* Tractor/implement traffic compaction and other hard pans
* Rainfall simulator and other soil health demonstrations

1. **Proposed special features** **[Modification requested? Yes/No]**

(e.g. labs, exhibits, site visitations, etc.)

22 Site visits across the state of Arkansas; experiential learning. Field-based experiences providing students with hands-on experience in the discipline of pedology.

1. **Department staffing and classroom/lab resources**

Course will not require any classroom space.

1. Will this require additional faculty, supplies, etc.?

Course will require an adjunct faculty member; all field equipment is already secured

1. **NO** Does this course require course fees?

*If yes: please attach the New Program Tuition and Fees form, which is available from the UCC website.*

**Justification**

**Modification Justification (Course Modifications Only)**

1. Justification for Modification(s)

Enter text...

**New Course Justification (New Courses Only)**

1. Justification for course. Must include:

a. Academic rationale and goals for the course (skills or level of knowledge students can be expected to attain)

This course intended to offer basic and advanced education in pedological principles and techniques including soil relationships to ecosystems, including agroecosystems. The course will include of a five-day field trip around the state of Arkansas with stops designed to include the major soils, ecosystems, and agricultural production systems in the state. At each site, genesis of the soil, its properties, and its classification will be discussed as will the natural ecosystem and/or agriculture production system at the site. Where appropriate, the impact of the agricultural systems on soil quality, soil health, and soil erosion will be discussed with emphasis on carbon and nutrient cycling and nutrient management. The goal for this course is to provide students background in pedology and hands-on experience in implementing the knowledge and skills for classifying soils and interpreting suitability for various land-uses. This course will help prepare students for careers with USDA Natural Resources Conservation Service and private soils consulting work as well as work with the state Health Department, Highway Department, Agriculture Department, and Natural Resources Department. Courses such as this, with a focus on hands-on/experiential learning (high impact activities) are part of an area of emphasis in the College of Agriculture strategic plan.

b. How does the course fit with the mission of the department? If course is mandated by an accrediting or certifying agency, include the directive.

The mission of the College of Agriculture is to discover, develop, and disseminate knowledge in agricultural and environmental systems to serve and benefit our students, the agricultural community and society. As such, this course serves our students by preparing them with the technical knowledge and skills needed to engage in soil classification and land-use interpretation activities in various careers in agriculture and natural resource management.

c. Student population served.

This course serves students in the College of Agriculture, specifically upper-level students majoring in Plant and Soil Science with an emphasis in Agronomy, as well as those minoring in Crop Consulting and Agronomic Services.

d. Rationale for the level of the course (lower, upper, or graduate).

This is an upper level course (4000 level). The course utilizes information learned in lower level courses and other upper level courses general to the topics of plant and soil science and applies it specifically to soil morphology, classification, and land-use evaluation.

**Assessment**

**Assessment Plan Modifications (Course Modifications Only)**

1. **Yes / No** Do the proposed modifications result in a change to the assessment plan?

*If yes, please complete the Assessment section of the proposal*

**Relationship with Current Program-Level Assessment Process (Course modifications skip this section unless the answer to #18 is “Yes”)**

1. What is/are the intended program-level learning outcome/s for students enrolled in this course? Where will this course fit into an already existing program assessment process?

PLO: Students will demonstrate mastery of fundamental concepts in plant and soil sciences.

PLO: Students will demonstrate depth in an emphasis area to support their professional goals.

This course provides depth in the Plant and Soil Science major for students pursuing a career in crop production or natural resource management; it also expands upon the fundamental concepts learned in lower level courses.

1. Considering the indicated program-level learning outcome/s (from question #19), please fill out the following table to show how and where this course fits into the program’s continuous improvement assessment process.

*For further assistance, please see the ‘Expanded Instructions’ document available on the UCC - Forms website for guidance, or contact the Office of Assessment at 870-972-2989.*

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| **Program-Level Outcome 1 (from question #19)** | Students will demonstrate mastery of fundamental concepts in plant and soil sciences. |
| Assessment Measure | The Capstone PSSC 4313 Course will solicit essays throughout the course corresponding to each section of the course. The Capstone Comprehensive Final Exam is designed to demonstrate Cohort Competence for the material. This a verbal exam. |
| Assessment  Timetable | Outcome assessed in Plant Growth and Development (PSSC 4313) annually in fall semesters |
| Who is responsible for assessing and reporting on the results? | Dr. Ed Brown (course instructor) is responsible for assessing this PLO and the CoA assessment chairperson assists in evaluating and analyzing results and action plans are developed by the Plant and Soil Science faculty. |

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| **Program-Level Outcome 2 (from question #19)** | Students will demonstrate depth in an emphasis area to support their professional goals. |
| Assessment Measure | Plant Production Project (Term paper). Essay will demonstrate students’ knowledge of appropriate greenhouse and nursery crops, crop production systems, and specific crop information necessary to successfully produce the crops. Proper essay writing and use of citations. Graded by rubric. |
| Assessment  Timetable | Outcome assessed in HORT 4333, Greenhouse and Nursery Production annually in Spring semesters |
|  |  |
| Who is responsible for assessing and reporting on the results? | Dr. Kim Pittcock is responsible for assessing this PLO and the CoA assessment chairperson assists in evaluating and analyzing results and action plans are developed by the Plant and Soil Science faculty. |

**Course-Level Outcomes**

1. What are the course-level outcomes for students enrolled in this course and the associated assessment measures?

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| **Outcome 1** | Students will be able to determine soil texture by feel. |
| Which learning activities are responsible for this outcome? | At each of the field stops, students will practice determining soil texture by feel. Students will gain experience doing texture by feel on all 12 soil texture types during the week-long field course. |
| Assessment Measure | Practical identification of soil texture by feel on four unknown soil samples. Correct identification of three of the four unknown samples is considered competent with four of the four considered mastery. 80% of students should attain mastery in this area. |

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| **Outcome 2** | Students will be able to properly identify hydric features in a soil profile. |
| Which learning activities are responsible for this outcome? | At each of the field sites where a soil pit is open for students to examine the soil profile, students will look for and identify soil hydric properties and discuss as a group. |
| Assessment Measure | Practical identification of soil hydric features in three separate soil pits that had not been seen prior. Students will be assessed on proper identification as well as explanation of how the specific hydric feature formed. Graded by rubric. |

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| **Outcome 3** | Students will understand land-use management practices that can be implemented to improve economic and environmental sustainability of agricultural and natural systems across the state. |
| Which learning activities are responsible for this outcome? | Visual examination of soil features and land-use systems across the state along with group discussions of land-use impacts on economic and environmental issues. |
| Assessment Measure | Written paper graded with rubric. |

*(Repeat if needed for additional outcomes)*

**Bulletin Changes**

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| **Instructions** |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Please include a before (with changed areas highlighted) and after of all affected sections.**  **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.** |

**PSSC 4713. Soil Quality Assessment and Interpretation** A study of the indicators of soil quality, documentation and measurement of soil quality, interpretations of soil quality, impacts and effects of management of soil quality, and the role of conservation planning in improving soil quality. Prerequisite, PSSC 2813. Fall, even.

**PSSC 4723. Agroecological Systems** Field-based course to develop a deeper conceptual and analytical framework for understanding agricultural ecosystems of the region. Students will work in teams and visit numerous working farms and agricultural enterprises in their quest to under­stand agricultural system sustainability. Prerequisites, AGEC 1003, AGST 2003, ANSC 1613, PSSC 1303, PSSC 2813. Summer.

**PSSC 4733. Soil Morphology and Classification** Field-based course to develop knowledge and skills in pedological principles and practices. Relationships among soil genesis, morphology, and land use will be emphasized. Students will visit numerous sites throughout Arkansas that show major soils in various ecosystems. Prerequisites, PSSC 1303, PSSC 2813. Summer.

**PSSC 4804. Principles of Crop Production** Introduction to agronomic cropping systems which includes production systems, concepts related to crop selection and genetics, establish­ment and management of the crop, and harvest management. Environmental issues related to crop production and sustainability are also evaluated. Prerequisites, PSSC 1303 and PSSC 2813. Fall.

**PSSC 4813. Soil Fertility** Principles involved in maintaining and increasing fertility of soil. Prerequisite, PSSC 2813, and CHEM 1013 and CHEM 1011 or CHEM 1043 and CHEM 1041. Spring.