Code # AG07

**New/Special Course Proposal-Bulletin Change Transmittal Form**

☒ **Undergraduate Curriculum Council** - Print 1 copy for signatures and save 1 electronic copy.

☐ **Graduate Council** - Print 1 copy for signatures and send 1 electronic copy to mmcginnis@astate.edu

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| ☒**New Course or** ☐ **Special Course (Check one box)***Please complete the following and attach a copy of the catalogue page(s) showing what changes are necessary.*  |

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| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**COPE Chair (if applicable)** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Department Chair:**  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**General Education Committee Chair (If applicable)**   |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Undergraduate Curriculum Council Chair** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**College Dean** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Graduate Curriculum Committee Chair** |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Vice Chancellor for Academic Affairs** |

1. Proposed Course Prefix and Number (For variable credit courses, indicate variable range.)

PSSC 4543

2. Course Title – if title is more than 30 characters (including spaces), provide short title to be used on transcripts. Title cannot have any symbols (e.g. slash, colon, semi-colon, apostrophe, dash, and parenthesis). Please indicate if this course will have variable titles (e.g. independent study, thesis, special topics).

Advanced GIS for Agriculture & Natural Resources (Advanced GIS for Ag & Nat Res)

3. Will this course be lecture only, lab only, lecture and lab, activity, dissertation, experiential learning, independent study, internship, performance, practicum, recitation, seminar, special problems, special topics, studio problems, student exchange, occupational learning credit, or course for fee purpose only (e.g. an exam)? Please choose one.

Lecture and Lab

4. What is the grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental)?

Standard letter

5. Is this course dual listed (undergraduate/graduate)?

NO

6. Is this course cross listed? (If it is, all course entries must be identical including course descriptions. It is important to check the course description of an existing course when adding a new cross listed course.)

NO

7. Brief course description (40 words or fewer) as it should appear in the bulletin.

Principles and advanced techniques of using Geographic Information System (GIS) concepts, equipment, and software used in agricultural, environmental and natural resource applications.

8. Indicate all prerequisites and 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).

a. Are there any prerequisites?

AGRI 3543 Fundamentals of GIS and GPS with a Grade of B or better

b. Why?

The students will build on the concepts and applications that the student gained in AGRI 3543 (Fundamentals of GIS and GIS)

9. Course frequency(e.g. Fall, Spring, Summer). Not applicable to Graduate courses.

Spring

10. Contact Person (Name, Email Address, Phone Number)

D. Keith Morris, Ph.D

kmorris@astate.edu

870-972-3468

11. Proposed Starting Term/Year

Spring 2014

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

If yes, what program?

Enter text...

13. Does this course replace a course being deleted? NO

If yes, what course?

Enter text...

Has this course number been used in the past? NO

*Submit Course Deletion Proposal-Bulletin Change Transmittal Form.*

14. Does this course affect another program? NO

If yes, provide contact information from the Dean, Department Head, and/or Program Director whose area this affects.

Enter text...

15. Justification should include:

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

This course will provide specific instruction and practice on a specialized area of Agriculture and can be used as an upper level elective in the College of Agriculture and Technology as well as other areas of study. GIS use in both agriculture and society in general has increased exponentially over the last two decades. Currently, there is not a course that provides our students with a comprehensive advanced knowledge of GIS and its applications. This area is not covered within the current content of the college’s courses.

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

One of the missions of the college is to educate students using the most advanced tools to assess the growing needs of agriculture; this course fits well into that mission.

c. Student population served.

The target audience for this course is the students in the College of Agriculture and Technology, but is open to students with interest in GIS and agriculture.

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

This is an advanced follow up course for AGRI 3543 (Fundamentals of GIS and GIS).

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

**Lecture and Lab Topics:**

Week 1: Introduction to class, introduce GIS exercises

Week 2: Introduction to Geographic Information Systems

Week 3: Map Design

Week 4: GIS Outputs

Week 5: Geodatabases

Week 6: Importing Spatial and Attribute Data

Week 7: Digitizing

Week 8: Geocoding

Week 9: GeoProcessing

Week 10: Spatial Analysis

Week 11: ArcGIS 3D Analyst

Week 12: ArcGIS Spatial Analysis

Week 13: Analyzing Patterns

Week 14: Identifying Clusters

17. Course requirements (e.g. research papers, projects, interviews, tests, etc.)

Weekly GIS projects/assignments and Test

18. Special features (e.g. labs, exhibits, site visitations, etc.)

Computer Lab using the most advanced GIS software.

19. Department staffing and classroom/lab resources (Will this require additional faculty, supplies, etc.?)

NO

20. What is the primary intended learning goal for students enrolled in this course?

The primary goal of this course is to provide a comprehensive overview how to gather information from the internet and collect GPS data and integrate them into a GIS project using state-of-the-art technology/software.

21. Reading and writing requirements:

a. Name of book, author, edition, company and year

GISTutorial Spatial Analysis Workbook 2, David W. Allen, ESRI Press, 2013

b. Number of pages of reading required per week: ~30-50

c. Number of pages of writing required over the course of the semester: Enter text...

22. High-Impact Activities (Check all that apply)

☐Collaborative assignments

☐Research with a faculty member

☒Diversity/Global learning experience

☐Service learning or community learning

☐Study abroad

☐Internship

☐Capstone or senior culminating experience

☐Other Explain: Enter text...

23. Considering the indicated primary goal (in Box #20), provide up to three outcomes that you expect of students after completion of this course.

**Outcome #1:** (For example, what will students who meet this goal know or be able to do as a result of this course?)

The student will be able to use advanced GIS technologies to solve practical problems.

Learning Activity:(For example, what instructional processes do you plan to use to help students reach this outcome?)

In the textbook and through a series of lectures the students will learn how to map quantities, choose individual classes, create map series, and work with different charts to solve problems using GIS.

Assessment Tool: (For example, what will students demonstrate, represent, or produce to provide evidence of their learning?)

Students will submit a series of tutorial exercises at the end of each Learning Activity that will be graded based on both content and context.

*(Repeat if needed for additional outcomes 2 and 3)*

**Outcome #2:**

The student will acquire and demonstrate the ability to collect and present GPS/GIS data and results in an informative and professional manner as it applies to agriculture and natural resources.

Learning Activity:

In the textbook and through a series of lectures the students will learn how to map where thing are using categories, population densities, and location and magnitude, plus analyzing patterns using various clustering algorithms and autocorrelation techniques..

Assessment Tool:

Students will submit a series of tutorial exercises at the end of each Learning Activity that will be graded based of both content and context.

**Outcome #3**:

Learning Activity:

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Assessment Tool:

24. Please indicate the extent to which this course addresses university-level student learning outcomes:

* 1. Global Awareness

☐Minimally
☒Indirectly
☐Directly

* 1. Thinking Critically

☐Minimally
☐Indirectly
☒Directly

* 1. Using Technology

☐Minimally
☐Indirectly
☒Directly

**From the most current electronic version of the bulletin, copy all bulletin pages that this proposal affects and paste it to the end of this proposal.**

**To copy from the bulletin:**

1. Minimize this form.
2. Go to <http://registrar.astate.edu/bulletin.htm> and choose either undergraduate or graduate.
3. This will take you to a list of the bulletins by year, please open the most current bulletin.
4. Find the page(s) you wish to copy, click on the “select” button and highlight the pages you want to copy.
5. Right-click on the highlighted area.
6. Click on “copy”.
7. Minimize the bulletin and maximize this page.
8. Right-click immediately below this area and choose “paste”.
9. For additions to the bulletin, please change font color and make the font size larger than the surrounding text. Make it noticeable.
10. For deletions, strike through the text, change the font color, and enlarge the font size. Make it noticeable.

**PSSC 3503. Agriculture Spatial Technologies I** Basic understanding and utilization of data collection and assessment using global position system receivers, direct and remote sensing, and geographic information system software related to crop production and nutrient management. Prerequisite, PSSC 2813. Fall.

**PSSC 3513. Agriculture Spatial Technologies II** The course will concentrate on a study of the electromagnetic properties of earth objects, vegetation, soils, water, and, the principles and operations of different sensors used to measure this energy. Prerequisite, PSSC 3503. Spring.

**PSSC 3802. Pasture and Forage Crops** Introduction to important forage and pasture crops in the mid south region. Discussions will include cropping systems, plant growth and develop­ment, physiology, and environmental considerations. Prerequisite, PSSC 1303. Fall, odd.

**PSSC 4313. Plant Growth and Development** Auxins, gibberellins, and various other regulators of plant growth, also phenomena such as flowering and dormancy. Prerequisites, CHEM 1052, HORT 2253 and PSSC 1303. Fall.

**PSSC 4342. Seed Analysis and Processing** Techniques and principles of seed analysis and grading, methods of producing and processing quality seeds and seed stocks. Demand.

**PSSC 4513. Plant Biotechnology** Course materials will address the why and how of plant gene transfer plus the issues involved in making those plants part of the agricultural landscape. Dual listed as PSSC 5513. Prerequisite: AGRI 2213 or BIOL 3013 or permission of instructor. Spring.

**PSSC 4543, Advanced GIS for Ag & Nat Res** Principles and advanced techniques of using Geographic Information System (GIS) concepts, equipment, and software used in agricultural, environmental, and natural resource applications. Prerequisite: AGRI 3543 with a Grade of B or better. Spring.

**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. Demand.

**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. Spring, Odd.

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

**PSSC 4822. Environmental Factors Affecting Plant Growth** Affect of environmental factors on growth of important crop species. Primary emphasis will be on water utilization, solar irradiance, and temperature on plant development. Methods of measurement of environmental factors will be included. Prerequisites, PSSC 1303. Demand.

**PSSC 4853. Soil and Water Conservation** Properties of soil which affect erosion and water infil­tration, with practical methods of holding water and soil. Dual listed as PSSC 5853. Prerequisite, PSSC 2813. Spring, odd.

**PSSC 489V. Special Problems in Plant and Soil Science** For students of senior standing to work on special problems. Approval of instructor and dean necessary. Fall, Spring, Summer.

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