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

**Course Revision Proposal Form**

**[x] Undergraduate Curriculum Council**

**[ ] Graduate Council**

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

Email completed proposals to curriculum@astate.edu for inclusion in curriculum committee agenda.

|  |  |
| --- | --- |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**COPE Chair (if applicable)** |
| Donald Kennedy 1/25/2019**Department Chair:**  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Head of Unit (If applicable)**   |
| J. Kim Pittcock 1/25/2019**College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Undergraduate Curriculum Council Chair** |
| Timothy Burcham 1/25/2019**College Dean** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Graduate Curriculum Committee Chair** |
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| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |

**General Education Committee Chair (If applicable)**   | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Vice Chancellor for Academic Affairs** |

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

John Nowlin, jnowlin@astate.edu, (870) 972-3468

2. Proposed Starting Term and Bulletin Year for Change to Take Effect

Fall 2019

3. Current Course Prefix and Number

AGST 3503

3.1 – **[NO]** Request for Course Prefix and Number change

 If yes, include new course Prefix and Number below. *(Confirm that number chosen has not been used before. For variable credit courses, indicate variable range. Proposed number for experimental course is 9. )*

 Enter text...

3.2 – [N/A] If yes, has it been confirmed that this course number is available for use?

 *If no: Contact Registrar’s Office for assistance.*

4. Current Course Title

Agriculture Spatial Technologies I

 4.1 – **[YES]** Request for Course Title Change

 If yes, include new Course Title Below.

 Geospatial Data Applications

1. 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).*

Enter text...

1. Please indicate if this course will have variable titles (e.g. independent study, thesis, special topics).

Enter text...

5. – **[YES ]** Request for Course Description Change.

 If yes, please include brief course description (40 words or fewer) as it should appear in the bulletin.

 Basic understanding and utilization of software applications to manage geospatial and tabular data, including text editors, spreadsheets, databases and geodatabases for data: collection, cleaning, joining, filtering, summarization, visualization and unit conversion.

6. – **[YES ]** Request for prerequisites and major restrictions change.

*(If yes, 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?

Prerequisites: AGST 2003, PSSC2813

Why or why not?

This change is intended to direct students toward courses which improve their understanding of environmental, scientific, and/or spatial subjects. This is so that they have a general working knowledge of the form of environmental/spatial concepts and data which will be explored in this course.

1. **No** Is this course restricted to a specific major?
	1. If yes, which major? Enter text...

7. – [**YES** ] Request for Course Frequency Change(e.g. Fall, Spring, Summer). *Not applicable to Graduate courses.*

 a. If yes, please indicate current and new frequency:

 Fall to Fall, Spring.

8. – [**NO** ] Request for Class Mode Change

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

 Enter text...

9. – [**No** ] Request for grade type change

*If yes, what is the current and the new grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental, or other [please elaborate])*

 Enter text...

10. **No** Is this course dual listed (undergraduate/graduate)?

 a. If yes, indicate course prefix, number and title of dual listed course.

 Enter text...

11. **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.)*

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

 Enter text...

**11.2** – N/A Are these courses offered for equivalent credit?

 Please explain. Enter text...

12. **No** Is this course change in support of a new program?

a. If yes, what program?

 Enter text...

13. **No** Does this course replace a course being deleted?

a. If yes, what course?

Enter text...

14. **No** Will this course be equivalent to a deleted course or the previous version of the course?

a. If yes, which course?

Enter text...

15. **Yes** Does this course affect another program?

If yes, provide confirmation of acceptance/approval of changes from the Dean, Department Head, and/or Program Director whose area this affects.

Plant and Soil Science - approved by Dean Burcham.

16. **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.*

**Revision Details**

17. Please outline the proposed revisions to the course.

*Include information as to any changes to course outline, special features, required resources, or in academic rationale and goals for the course.*

 The goals of the revision are to remove material which is covered in AGST 3543 while increasing the emphasis on familiarity with geospatial and tabular data for students who have not had much experience in spreadsheets, databases and geodatabases.

18. Please provide justification to the proposed changes to the course.

 We are working on a realignment of our Geospatial Course offerings. This course becomes one of the possible prerequisites/corequisites for AGST 3543 (the AGST core course). This change will allow us to start at a higher level in AGST 3543 and get more accomplished in that course.

19. **No** Do these revisions result in a change to the assessment plan?

 *\*If yes: Please complete the Assessment section of the proposal on the next page.*

 *\*If no: Skip to Bulletin Changes section of the proposal.*

***\*See question 19 before completing the Assessment portion of this proposal.***

**Assessment**

**Relationship with Current Program-Level Assessment Process**

20. 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?

This course will develop the skills and background knowledge needed to accomplish the capstone project, which occurs in AGST 4843 and relates to all three of the three below listed program objectives.

21. Considering the indicated program-level learning outcome/s (from question #23), please fill out the following table to show how and where this course fits into the program’s continuous improvement assessment process.

|  |  |
| --- | --- |
| **Program-Level Outcome 1 (from question #23)** | Students will be able to assess a set of spatial phenomena relevant to agriculture or other human-environment interactions. |
| Assessment Measure | In the course AGST 4843 Geospatial Capstone, a paper, oral/visual presentation, or poster, meeting the standards of presentations in a professional academic forum will be prepared and delivered by the student in class. This presentation will be reviewed by the committee specified below and the students work will need to meet the mutually agreed upon goals relating to assessment of spatial phenomena relevant to agriculture or other human-environment interactions. This project will approved by the student and course instructor and recorded in a customized rubric. . |
| Assessment Timetable | This outcome is assessed in the capstone course (AGST 4843) in the Spring of the Senior year. |
| Who is responsible for assessing and reporting on the results? | Committee Including:Dr. John W. Nowlin, Assistant Professor of Geospatial TechnologyDr. Ahmed Hashem, Assistant Professor of Agricultural Systems TechnologyA rotating full-time faculty member of the College of Agriculture or a State/County Agricultural Extension Agent with a Master’s Degree or higher and a related professional specialization.  |

 *(Repeat if this new course will support additional program-level outcomes)*

|  |  |
| --- | --- |
| **Program-Level Outcome 2 (from question #23)** | Students will be able to choose an effective set of decision tools for a current agricultural or environmental problem. |
| Assessment Measure | In the course AGST 4843 Geospatial Capstone, a paper, oral/visual presentation, or poster, meeting the standards of presentations in a professional academic forum will be prepared and delivered by the student in class. This presentation will be reviewed by the committee specified below and the students work will need to meet the mutually agreed upon goals about choosing effective decision tools for a problem related to agriculture or the environment. This project will be approved by the student and course instructor and recorded in a customized rubric.  |
| Assessment Timetable | This outcome is assessed in the capstone course (AGST 4843) in the Spring of the Senior year. |
| Who is responsible for assessing and reporting on the results? | Committee Including:Dr. John W. Nowlin, Assistant Professor of Geospatial TechnologyDr. Ahmed Hashem, Assistant Professor of Agricultural Systems TechnologyA rotating full-time faculty member of the College of Agriculture or a State/County Agricultural Extension Agent with a Master’s Degree or higher and a related professional specialization.  |

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| **Program-Level Outcome 3 (from question #23)** | Students will be able to design a solution to an existing problem related to agriculture, the environment, or natural resources. |
| Assessment Measure | In the course AGST 4843 Geospatial Capstone, a paper, oral/visual presentation, or poster, meeting the standards of presentations in a professional academic forum will be prepared and delivered by the student in class. This presentation will be reviewed by the committee specified below and the students work will need to meet the mutually agreed upon goals relating to the design of a project representing the solution to an existing problem using geospatial technology relating to agriculture the environment or natural resources. This project will be approved by the student and course instructor and recorded in a customized rubric.  |
| Assessment Timetable | This outcome is assessed in the capstone course (AGST 4843) in the Spring of the Senior year. |
| Who is responsible for assessing and reporting on the results? | Committee Including:Dr. John W. Nowlin, Assistant Professor of Geospatial TechnologyDr. Ahmed Hashem, Assistant Professor of Agricultural Systems TechnologyA rotating full-time faculty member of the College of Agriculture or a State/County Agricultural Extension Agent with a Master’s Degree or higher and a related professional specialization.  |

 **Course-Level Outcomes**

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

|  |  |
| --- | --- |
| **Outcome 1** | Demonstrate ability to create geographic data |
| Which learning activities are responsible for this outcome? | Using a simple text editor, a GPS application on a phone and a digital globe application, the student will learn to generate location based information, and georeference study areas (primarily farm fields). |
| Assessment Measure  | lab work and on an Exam Practicum |

|  |  |
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| **Outcome 2** | Demonstrate ability to manipulate and summarize simple geospatial data. |
| Which learning activities are responsible for this outcome? | The students will be guided on moving data from a flat file to a spreadsheet to a database to a map, and introduced to basic formulas for summarization and principles of spatial data organization using both open source and professional software applications. |
| Assessment Measure  | lab work and on an Exam Practicum. |

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| **Outcome 3** | Demonstrate the ability to join and query geospatial data |
| Which learning activities are responsible for this outcome? | A variety of tabular structures will be joined and queried, including tables in a professional database application, attribute tables in shapefiles, geodatabase feature classes and flat files. |
| Assessment Measure  | lab work and on an Exam Practicum |

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| **Outcome 4** | Become familiar with spatial data frameworks |
| Which learning activities are responsible for this outcome? | Both raster and vector data models will be investigated and compared to simple flat files of location based data and grid architectures. |
| Assessment Measure  | lab work and on an Exam Practicum |

**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. Follow the following guidelines for indicating necessary changes.** **\*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.** - Deleted courses/credit hours should be marked with a red strike-through (~~red strikethrough~~)- New credit hours and text changes should be listed in blue using enlarged font (blue using enlarged font). - Any new courses should be listed in blue bold italics using enlarged font (***blue bold italics using enlarged font***)*You can easily apply any of these changes by selecting the example text in the instructions above, double-clicking the ‘format painter’ icon 🡪 , and selecting the text you would like to apply the change to.* *Please visit* [*https://youtu.be/yjdL2n4lZm4*](https://youtu.be/yjdL2n4lZm4) *for more detailed instructions.* |

Multiple bulletin changes associated with an AGST program realignment are being submitted. Below is the primary program for these changes which is Pgs. 115, 118, 122, 124, 125 & 432 of the 2018-2019 Undergraduate Bulletin. Other changes are addressed in numerous proposals submitted concurrently.

\*Due to the high number of concurrent changes, for clarity, these revisions are highlighted at the end on the bulletin page.

Pg. 115 …

**Major in Agricultural Studies**

**Bachelor of Science in Agriculture Emphasis in Agricultural Communications**

A complete 8-semester degree plan is available at<https://www.astate.edu/info/academics/degrees/>

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| --- | --- |
| **University Requirements:** |  |
| See University General Requirements for Baccalaureate degrees (p. 44) |  |
| **First Year Making Connections Course** | **Sem. Hrs.** |
| AGRI 1213, Making Connections in Agriculture | **3** |
| **General Education Requirements:** | **Sem. Hrs.** |
| See General Education Curriculum for Baccalaureate degrees (p. 89)**Students with this major must take the following:***MATH 1023, College Algebra or MATH course that requires MATH 1023 as a prerequisite BIOL 1003* ***AND*** *BIOL 1001, Biological Science and Laboratory**CHEM 1013,* ***AND*** *CHEM 1011, General Chemistry I and Laboratory* ***OR****CHEM 1043* ***AND*** *CHEM 1041, Fundamental Concepts of Chemistry and Laboratory CMAC 1003, Mass Communications in Modern Society**ECON 2313, Principles of Macroeconomics* ***OR****ECON 2333, Economic Issues and Concepts**COMS 1203, Oral Communication (Required Departmental Gen. Ed. Option)* | **35** |
| **Agriculture Core Courses:** | **Sem. Hrs.** |
| (See Beginning of Agriculture Section) | **24** |
| **Major Requirements:** | **Sem. Hrs.** |
| See emphasis area below. | **-** |
| **Emphasis Area (Agricultural Communications:)** | **Sem. Hrs** |
| AD 3023, Principles of Advertising **OR**PR 3003, Principles of Public Relations | 3 |
| AGEC 3063, Agricultural Sales and Services | 3 |
| AGEC 4083, Agricultural Policy and Current Issues | 3 |
| AGED 1411, Introduction to Agricultural and Extension Education | 1 |
| AGED 3443, Leadership in Agriculture | 3 |
| AGED 445V, Practicum in Agricultural Communications | 3 |
| AGED 4462, Agricultural Youth Organizations | 2 |
| AGRI 420V, Internships in Agriculture | 3 |
| AGRI 4433, Organic Agricultural Production | 3 |
| AGRI 4223, Agriculture and the Environment | 3 |
| ~~AGST 1003, Modern Agricultural Systems~~  | ~~3~~ |
| AGST 3503, Geospatial Data Applications ORAGST 4003, Modern Irrigation Systems | ***3*** |
| AGST 3543, Fundamentals of GIS/GPS | 3 |
| CMAC 1001, Media Grammar and Style | 1 |
| CMAC 2003, Media Writing | 3 |
| CMAC 2053, Introduction to Visual Communications | 3 |
| ENG 3043, Technical Writing **OR**MDIA 4053, Advanced Reporting | 3 |
| MDIA 2013 **AND** MDIA 2010, Multimedia Reporting Laboratory | 3 |
| MDIA 2313, Multimedia Production | 3 |

*The bulletin can be accessed at* [*https://www.astate.edu/a/registrar/students/bulletins/*](https://www.astate.edu/a/registrar/students/bulletins/)

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**Major in Agricultural Studies**

**Bachelor of Science in Agriculture**

**Emphasis in Agricultural Systems Technology**

A complete 8-semester degree plan is available at <https://www.astate.edu/info/academics/degrees/>

|  |  |
| --- | --- |
| **University Requirements:** |   |
| See University General Requirements for Baccalaureate degrees (p. 44) |   |
| **First Year Making Connections Course** | **Sem. Hrs.** |
| AGRI 1213, Making Connections in Agriculture | **3** |
| **General Education Requirements:**  | **Sem. Hrs.** |
| See General Education Curriculum for Baccalaureate degrees (p. 89)**Students with this major must take the following:***MATH 1023, College Algebra or MATH course that requires MATH 1023 as a prerequisite**~~PHYS 2054, General Physics I~~* *BIOL 1003* ***AND*** *BIOL 1001, Biological Science and Laboratory****CHEM 1013 AND 1011, General Chemistry I and Laboratory OR******CHEM 1043 AND CHEM 1041, Fundamental Concepts of Chemistry and Laboratory****COMS 1203, Oral Communication (Required Departmental Gen. Ed. Option)* | **35** |
| **Agriculture Core Courses:**  | **Sem. Hrs.** |
| (See Beginning of Agriculture Section)  | **24** |
| **Major Requirements:** | **Sem. Hrs.** |
| See emphasis area below. |   |
| **Emphasis Area (Agricultural Systems Technology):** | **Sem. Hrs** |
| *Select one of the following:*~~AGEC 3003, Agricultural Marketing~~AGEC 3013, Agricultural Records **OR**~~AGEC 3063, Agricultural Sales and Service~~ AGST 3503, Geospatial Data Applications | 3 |
| ~~AGED 3433, Agricultural Equipment Hydraulic Systems~~ | ~~3~~ |
| AGRI 4223, Agriculture and the Environment | 3 |
| ~~AGST 1003, Modern Agricultural Systems~~ | ~~3~~ |
| ~~AGST 3503, Agricultural Spatial Technologies I~~  | ~~3~~ |
| ~~AGST 3513, Agricultural Spatial Technologies II~~ | ~~3~~ |
| AGST 3543, Fundamentals of GIS/GPS | 3 |
| AGST 4003, Modern Irrigation Systems | 3 |
| ~~AGST 4013, Precision Application Technology~~***AGST 4022, Irrigation Technology Tools*** | ~~3~~***2*** |
| AGST 4543, Advanced ~~GIS for Agriculture and Natural Resources~~ Geographic Information Systems | 3 |
| *Select one of the following:* ***AGST 4501, Agricultural Decision Analysis*** **OR** ***AGST 4511, Introduction to Unmanned Aircraft Systems*** | ***1*** |
| AGST 4773, Remote Sensing | 3 |
| AGST 4843, Agricultural Systems Technology Capstone | **3** |
| *Select one of the following:*BIO 3023, Principles of Ecology **OR**GEOG 3723, Introduction to Physical Geography **OR**GEOG 4113, Water Resources Planning **OR**GEOG 4633, Climatology~~CHEM 1043 Fundamental Concepts of Chemistry~~  | **3** |
| *Select one of the following:*BIO 1503 AND 1501, Biology of Plants and Laboratory **OR**GEOL 1003 AND 1001, Environmental Geology and Laboratory **OR**PHSC 1014, Energy and the Environment **OR**PHSC 1203 AND 1201, Physical Science and Laboratory **OR**PHYS 1103 AND 1101, Intro to Space Science and Laboratory **OR**PHYS 2054, General Physics I ~~PHYS 2064, General Physics II~~  | 4 |
| *Select one of the following:*CIT 1503, Microcomputer Applications **OR**CS 1013, Introduction to Computers Applications  | **3** |
| GEOG 2613, Introduction to Geography | 3 |
| MATH 1033, Plane Trigonometry | 3 |
| *Select ~~one~~ two of the following:*PSSC 3313, Plant Disease Management **OR**PSSC 3323, Weeds and Weed Control **OR**PSSC 4713, Soil Quality Assessment and Interpretation **OR**PSSC 4804, Principles of Crop Production **OR**PSSC 4813, Soil Fertility **OR**~~PSSC 4853, Soil and Water Conservation~~ | ~~3~~ **6-7** |
| TECH 3803, Electrical Systems | 3 |
| ~~TECH 3863, Industrial Safety~~ | ~~3~~ |
| ~~TECH 4813, Operations Systems Research~~ | ~~3~~ |
| Upper-level electives in **AGEC,** AGST, AGRI, PSSC. | ~~3~~ **8-9** |
| **Sub-total** | **58** |
| **Total Required Hours:** | **120** |

*The bulletin can be accessed at* [*https://www.astate.edu/a/registrar/students/bulletins/*](https://www.astate.edu/a/registrar/students/bulletins/)

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**Major in Plant and Soil Science**

**Bachelor of Science in Agriculture Emphasis in Agronomy**

A complete 8-semester degree plan is available at<https://www.astate.edu/info/academics/degrees/>

|  |  |
| --- | --- |
| **University Requirements:** |  |
| See University General Requirements for Baccalaureate degrees (p. 44) |  |
| **First Year Making Connections Course** | **Sem. Hrs.** |
| AGRI 1213, Making Connections in Agriculture | **3** |
| **General Education Requirements:** | **Sem. Hrs.** |
| See General Education Curriculum for Baccalaureate degrees (p. 89)**Students with this major must take the following:***MATH 1023, College Algebra or MATH course that requires MATH 1023 as a prerequisite CHEM 1043* ***AND*** *1041, Fundamental Concepts of Chemistry and Lab**BIOL 1003* ***AND*** *1001, Biological Sciences and Laboratory**COMS 1203, Oral Communication (Required Departmental Gen. Ed. Option)* | **35** |
| **Agriculture Core Courses:** | **Sem. Hrs.** |
| (See Beginning of Agriculture Section) | **24** |
| **Major Requirements:** | **Sem. Hrs.** |
| AGEC 3013, Agricultural Records **OR**CIT 1503, Microcomputer Applications | 3 |
| AGRI 2213, Genetic Improvement of Plants and Animals | 3 |
| AGRI 4223, Agriculture and the Environment | 3 |
| BIO 3303 **AND** 3301, General Entomology and Laboratory **OR**BIO 3313 **AND** 3311, Economic Entomology and Laboratory | 4 |
| PSSC 3313, Plant Disease Management | 3 |
| PSSC 2811, Soils Laboratory | 1 |
| PSSC 1301, Plant Science Laboratory | 1 |
| PSSC 4313, Plant Growth and Development | 3 |
| **Sub-total** | **21** |
| **Emphasis Area (Agronomy):** | **Sem. Hrs.** |
| AGST 3503, ~~Agricultural Spatial Technologies~~ **Geospatial Data Applications OR** **AGST 4003, Modern Irrigation Systems** | 3 |
| AGST 3543, Fundamentals of GIS~~and~~**/**GPS | 3 |
| CHEM 1052, Fundamental Concepts of Organic and Biochemistry | 2 |
| PSSC 3323, Weeds and Weed Control | 3 |
| PSSC 4804, Principles of Crop Production | 4 |
| PSSC 4813, Soil Fertility | 3 |
| AGRI, AGST, HORT or PSSC electives, or BIO 1503, Biology of Plants, or related area | 14 |
| **Sub-total** | **32** |
| **Electives:** | **Sem. Hrs.** |
| Electives | **5** |
| **Total Required Hours:** | **120** |

*The bulletin can be accessed at* [*https://www.astate.edu/a/registrar/students/bulletins/*](https://www.astate.edu/a/registrar/students/bulletins/)

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**Minor in Crop Consulting and Agronomic Services**

*Plant & Soil Science Majors may not minor in Crop Consulting and Agronomic Services*

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| --- | --- |
| **Required Courses:**Students must maintain a minimum GPA of 3.0 and a grade of at least a “C” for each course in the minor. | **Sem. Hrs.** |
| **Select six of the following:**~~AGST 3503, Agricultural Spatial Technologies I~~ **~~OR~~**AGST 3543, Fundamentals of GIS ~~and~~**/**GPS AGST 4003, Modern Irrigation SystemsBIO 3313, Economic EntomologyPSSC 3313, Plant Disease Management PSSC 3323, Weeds and Weed Control PSSC 4343, Seed Analysis and ProcessingPSSC 4713, Soil Quality Assessment and Interpretation PSSC 4804, Principles of Crop ProductionPSSC 4813, Soil Fertility | 18 or 19 |
| **Total Required Hours:** | **18 or 19** |

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**~~Minor in Spatial Technologies and Geographic Information Systems~~
Minor in Precision Agriculture**

|  |  |
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| **Required Courses:**Students must maintain a minimum GPA of 3.0 and a grade of at least a “C” for each course in the minor. | **Sem. Hrs.** |
| AGST 3503, ~~Agricultural Spatial Technologies I~~ Geospatial Data Applications | 3 |
| ~~AGST 3513, Agricultural Spatial Technologies II~~ | ~~3~~ |
| AGST 3543, Fundamentals of GIS/GPS | 3 |
| AGST 4003, Modern Irrigation Systems | 3 |
| ~~AGST 4013, Precision Application Technology~~***AGST 4022, Irrigation Technology Tools*** | ~~3~~***2*** |
| AGST 4543, Advanced ~~GIS for Agriculture and Natural Resources~~ Geographic Information Systems | 3 |
| *Select one of the following:****AGST 4501, Agricultural Decision Analysis*** **OR*****AGST 4511, Intro to Unmanned Aircraft Systems*** | ***1*** |
| AGST 4773, Remote Sensing | 3 |
| **Total Required Hours:** | **18** |

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*The bulletin can be accessed at* [*https://www.astate.edu/a/registrar/students/bulletins/*](https://www.astate.edu/a/registrar/students/bulletins/)

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# Agricultural Systems Technology (AGST)

**~~AGST 1003. Modern Agricultural Systems~~** ~~Multidisciplinary introduction to various crop and animal production systems, system interactions, problems, and solutions that lead to a sustainable agricultural productivity. Fall, Spring~~.

**AGST 2003. Intro to Agricultural Systems Technology** Introduction to physical concepts relevant to different agricultural systems: applied mechanics, agricultural equipment technology, agricultural power trains and machinery management, efficiency and precision. Prerequisites: CS 1013 or CIT 1503, ENG 1013, MATH 1023 or higher. Fall.

**AGST 3503. ~~Agriculture Spatial Technologies I~~**Geospatial Data Applications 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.~~software applications to manage geospatial and tabular data, including text editors, spreadsheets, databases and geodatabases for data: collection, cleaning, joining, filtering, summarization, visualization and unit conversion. Prerequisite: AGST 2003, PSSC 2813. Fall, Spring.

**~~AGST 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, AGST 3503.~~

**AGST 3543. Fundamentals of GIS/GPS**~~Fundamentals of GPS-Global Positioning System and GIS-Geographical Information System concepts, equipment, and software used in agricultural, environmental, and natural resource applications~~ Geospatial data acquisition, mapping, and interpretation for human-environment interactions using geographic information systems and the global positioning system. Prerequisites: COMS 1203, ENG 1013, MATH 1023 or higher; Prerequisite or corequisite: AGEC 3013 or AGST 3503 or BIO 3023. Fall, Spring.

**AGST 4003. Modern Irrigation Systems** Methods, equipment, current issues and future directions of irrigation, irrigation design and scheduling, drainage systems, irrigation measurements, performance evaluation, and impact on productive and sustainable agriculture. Two hours lecture and two hours lab weekly. Dual listed with AGST 5003. Prerequisites: AGST 2003; PSSC 2813. Spring.

**~~AGST 4013. Precision Application Technology~~** ~~Techniques of soil and crop homogeneity de- tection and variable-rate precision application of crop inputs to increase productivity and enhance environmental sustainability. 2 hours lecture and 2 hours lab weekly. Dual listed with AGST 501~~**~~V~~**~~3.~~ ~~Spring~~**~~.~~**

***AGST 4022. Irrigation Technology Tools***  *Technical tools and software related to irrigation system hydraulic design and management. Dual listed with AGST 5022. Prerequisites: AGST 3543, AGST 4003. Fall.*

***AGST 4501. Agricultural Decision Analysis*** *Hands-on experience with cloud/desktop software, spatial algorithms and image processing of georeferenced data obtained from diverse sources, such as human scouts, ground and equipment sensors, and unmanned aerial systems. Dual listed with AGST 5501. Prerequisite: AGST 3543 with a grade of B or better. Fall.*

***AGST 4511. Introduction to Unmanned Aircraft Systems*** *Software and mobile applications for designing flight missions, collecting data, and analyzing/interpreting imagery for agricultural practices. Intended to prepare students for the Federal Aviation Administration (FAA) remote pilot license exam. Dual listed with AGST 5511. Prerequisites: AGST 3543, AGST 4773. Fall.*

**AGST 4543. Advanced Geographic Information Systems ~~GIS for Agriculture and Natural Resources~~** ~~Principles and advanced techniques of using Geographic Information System (GIS) concepts, equipment, and software used in agricultural, environmental, and natural resource applications.~~Methods, concepts, software, analysis and modeling of geospatial data using raster and vector data models for human-environment interactions using geographic information systems (GIS). Prerequisite, AGST 3543 with a grade of B or better. Spring.

**AGST 4773. Remote Sensing** ~~The course will cover the image acquisition and image processing methods using ERDAS Image software as the analytical assessment package.~~Passive and active means of aerial and satellite image acquisition, processing, analysis, and interpretation for research and decision making in agricultural, environmental, and natural resource applications. Prerequisite, AGST 3543 with a grade of B or better. Fall.

**AGST 4843~~3513~~. ~~Agriculture Spatial Technologies II~~ Agricultural Systems Technology Capstone** ~~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.~~ Designing modern geospatial solutions for problems related to agriculture, the environment, and natural resources. (AGST majors only) Prerequisites: AGST 3503, AGST 4543, AGST 4773 Spring.

***AGST 489V. Special Problems in Agricultural Systems Technology*** *For students of senior standing to work on special problems. Approval of instructor and dean necessary. Fall, Spring, Summer.*

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