AGRY 598 Precision Crop Management. Sem. 1 Cr. 3. CRNs 10212 and 10211.

An experiential lecture, discussion and field laboratory course for graduating seniors (December 2018 or May 2019). May be used in combination with AGRY 498 to meet the Agronomy undergraduate capstone requirement; will also meet the GIS/GPS requirement in Agronomy plans of study. Prerequisites: Semester 6, 7 or 8 in Agronomy and AGRY 25500, AGRY 25500 or consent of instructor.

Topics planned include but are not limited to GPS, GIS, RTK, auto steer basics, GIS data collection, crop management software and the use of integrated spatial data in zone management decision-making. Includes harvest operations and accurate yield mapping, soil sampling, precision zone P, K and pH management, N management, remotely-sensed data interpretation, variable rate and variable genetic planting, planting systems, spray systems, tile drainage design and installation, field operation logistics, crop residue management, cover crops, soil compaction, irrigation management and crop diagnostics. Consent of instructor required. Taught by Dr. Lee Schweitzer with support from industry professionals and additional Purdue Agronomy faculty including Drs. Eileen Kladivko, Jim Camberato, Bob Nielsen and Jason Ackerson.

1. Course Resource Website
https://ag.purdue.edu/agry/courses/Pages/agry598.aspx

2. Class Meetings
Attendance is required. The class meets each Tuesday 1:30 to 5:20 p.m. (includes travel time for off-campus field demonstrations when scheduled). Please see the class schedule for meeting locations. The first class meeting is in 3-102 Lilly Hall. However, subsequent classes are scheduled for Field Trip Bus Loading on Russell Street west of Lilly Hall, B-286 Beering Computing Lab, 3-102 Lilly Hall or 2-425 Lilly Hall as listed on the schedule. Please follow the published schedule carefully to note the location of each class.

3. Field Trips
On days scheduled for field trips (see the class schedule) please board the bus at the curb of Russell Street west of Lilly Hall. The bus will leave promptly at 1:30 p.m. so please plan to arrive on time. If an emergency arises and you are delayed or cannot attend class please notify Dr. Schweitzer prior to class if possible (cell phone 765 413 5994 ; email lschweitz@purdue.edu).

4. Grading Policy and Performance Evaluation
This class is structured to provide students with opportunities to gain practical insight and experience with a wide array of emerging crop management technologies and strategies. It is our goal to work with each student to maintain a high level of learning and performance. However, unsatisfactory participation or incompletion of the requirements listed below will result grade reductions as indicated.
Each student will receive a score for each of three components (Attendance, Participation and the Team Presentation) as listed below. The course grade will then be assigned on the basis of a total composite score of 120 points possible per the Course Grading Scale as follows.

### Course Grading Scale (Sum Of All Components)

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Percentage Range</th>
<th>Composite Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 - 100%</td>
<td>108 - 120 points</td>
</tr>
<tr>
<td>B</td>
<td>80 - 89%</td>
<td>96 - 107 points</td>
</tr>
<tr>
<td>C</td>
<td>70 - 79%</td>
<td>84 - 95 points</td>
</tr>
<tr>
<td>D</td>
<td>60 - 69%</td>
<td>72 - 83 points</td>
</tr>
<tr>
<td>F</td>
<td>≤ 59</td>
<td>≤ 71 points</td>
</tr>
</tbody>
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**a) Attendance (40 Points):** Attendance is required. Points will be deducted for unexcused absence beginning with the second class meeting. One or fewer unexcused absences will result in an attendance grade of “A” (40 points). Two unexcused absences will result in an attendance grade of “B” (32 points). Three unexcused absences will result in an attendance grade of “C” (28 points). Four unexcused absences will result in an attendance grade of “D” (24 points). Five or more unexcused absences will result in an attendance grade of “F” (20 points). Please see Dr. Schweitzer (in advance if possible) to request an excused absence. Please also see Dr. Schweitzer for makeup assignments for work missed during an excused absence.

**b) Participation (40 Points):** As a capstone course active participation by all students is expected in each class meeting. Ask questions which exercise critical and analytical thinking and communicate as a professional in interactions with industry representatives, farmers, fellow students and the faculty. Each student is expected to highlight (e.g. star) in their daily class notes the key actionable concepts emphasized during each day’s presentation.

Students’ notes for the class on August 21 will be collected at the end of the class period and returned at the next class meeting on August 28. Notes from August 28 through November 27 will be collected on November 27 and returned on December 4. Notes are to be dated and include the author’s name along with the name(s) of the speakers.

Your notes will document attendance, provide input for your participation grade, and serve as a valuable reference for your use as you prepare your team presentation and as a future professional resource. Students who are fully attentive in class, take excellent notes and actively participate in discussions will earn an “A” for this portion of the class (40 points) for their participation. Lesser engagement in class, submission of notes that do not reflect thought and analysis will result in a participation grade of “B” (32 points) for good but not excellent participation. A participation grade of “C” (28 points) will be earned for minimally satisfactory engagement and notes. A participation grade of “D” (24 points) will be earned for low levels interaction in class and poor quality notes. A participation grade of “F” (20 points) will be earned for attendance with no notes submitted and no participation in class discussions.
c) Team Presentation (40 Points):

Each student will be a part of a team of 3 to 5 students to compose, practice and present a Precision Crop Management topic selected from a list provided and targeted for an industry or extension farmer audience.

**PowerPoint presentations (required format** so no internet issues will arise from on-line applications – no exceptions) are to be 25 to 30 minutes in length, professional grade, supported by valid data, photos, graphics and video clips as appropriate. Each presentation is to be informative, well organized, practiced and structured in such a way that an industry or extension farmer audience member will be able to take home key points and translate them to action.

Team presentations may be added to each students’ academic portfolio and will boost students’ professional prospects as evidence of professional presentation capability and experience.

Students who contribute at a level of excellence in all phases of the development and delivery of their team’s presentation will earn a presentation grade of “A” (40 points). Good but not excellent contributions will earn a presentation grade of “B” (32 points). Minimally satisfactory contributions will earn a presentation grade of “C” (28 points). Low levels of contribution will earn a presentation grade of “D” (24 points). Poor levels of contribution will earn a presentation grade of “F” (20 points).

Each team will include a captain responsible for communications among and preparation by team members.

Each presentation should include (but is not limited to) answers to you intended audience’s questions such as the following.

1. What is the technology/agronomy crop management concept, how does it work and why is it relevant and of potential value to the farmer?
2. Is the technology practical and adaptable to the farm they own or manage or for farms for which they provide technical support?
3. Will the utilization of this technology/implementation of these agronomic management concepts return positively on investment, produce a significant improvement in crop management efficiency (lower cost per bushel) and or reduce crop production risks?

Please begin preparation of your presentation early in the semester and take full advantage of university faculty, industry representative, farmer, library database (specifically Agricola) and university and industry web-based resources. Sources for your presentation must be properly cited. There are no restrictions on the range of resources you can utilize so please think broadly and be imaginative.

1) The key to a successful presentation is to start early with your preparation.

2) Planning should begin very early in the semester as your team outlines an approach to the topic you choose.
3) Conduct a thorough literature review using the Purdue Library databases (such as Agricola) and on-line extension and industry resources. Each team is required to schedule an appointment with and meet with the Purdue Agriculture Sciences Information Specialist Danielle N. Walker walke524@purdue.edu in WALC between September 12 and 28 so she can help you with your search of the literature relating to your presentation topic. Danielle will join us in class on September 11 to introduce herself and to provide a brief introduction of search strategies.

Purdue Library Resources (Books & Media, Articles, Website, Databases, Online Journals)

https://www.lib.purdue.edu

4) Network with university and industry professionals to gain valuable direction and insight and adhere to a time line that allows sufficient time for preparation and multiple cycles to practice and upgrade. Gaps in coverage and support show up best through formal practice.

Please take full advantage of university faculty, industry representative, farmer, library database and university and industry web-based resources. All sources must be properly cited.

There are no restrictions on the range of resources you can utilize so please think broadly and be imaginative.

A well-developed outline of each team’s presentation content is due in class on October 30 and will be presented to the entire class team by team as a detailed outline on whiteboards in a workshop in class on that day.

Each team will make a formal dry-run presentation (slides finalized as nearly as possible and presentation practiced more than once) in class in 2-425 Lilly Hall on either November 6 or November 13 depending on your team assignment. Dry runs are to provide opportunity for constructive peer and faculty review and critique.

Final presentations are scheduled for November 27 and December 4 in 2-425 Lilly Hall depending on the schedule for each team.

**Presentation Topics (Student Topic Preferences Indicated By Sign Up On August 21. Team Assignments Will Be Announced In Class On August 28)**

Topic Areas Are A General Guideline – Student teams may narrow (but not broaden) the scope of their presentation – class discussion and draft outlines (in particular at the workshop on October 30) will assist teams in narrowing their focus on their topic and avoiding topic overlap. You are welcome to pull out specific pieces of a topic as your preferred point of emphasis and clearly indicate that in your notes with your ranking. You are also welcome to suggest another topic not listed and that topic will be taken into consideration as well.

1. Zone Management – Agronomics Of Variable Seeding Rate and Genetics (Corn Hybrids and/or Soybean Varieties), Data Supporting Or Refuting Variable Population and Genetics.
2. Corn Planting Technology – Active / Passive Downpressure Control and Margin Management, Seed Singulation & Spacing (Include Precision Planting Yield Response), Fast Planters, Row Residue Management – Clean Sweep & Other,


4. Zone Management - Nitrogen Prescriptions - Include Leaf Reflectance and Soil Sensor Input, Integrated Software e.g. ENCIRCA Nitrogen Service and Climate Corp FieldView Nitrogen Management, Land Grant University N Rate Calculator For Eastern Corn Belt States, Other Approaches. Also Include N contribution from cover crops.

5. Auto Steer, Swath Control, Boom Control, Section Control, Direct Injection Spray System And Other RTK Efficiencies / Machine Synchronization (Multiple Planters/Combines/Sprayers/Combines & Grain Carts), Labor and Equipment Utilization, Pesticide and Fuel Savings, Environmental Stewardship, and Pesticide Application, Family Time, Farm Business Operations. (Please leave out the mechanics of variable seeding rate and hybrid/variety as well as variable rate fertilizer and ag lime, as these topics are to be presented by other group presentations.)

6. Combine Set Up, Yield Monitor Calibration, Yield Mapping

7. Demonstrating The Value Of Integrative Precision Crop Management Software – Compare Commercial Integrated Software Available and Discuss Their Value For Zone Management Agronomic Decision Making – Producer Goals and Needs, What Level Of Software Fits Best With Producer Goals? Include To Apply Maps, As Applied Maps Economic Summaries (Profit Or Loss $/Acre, $/Bushel).

Data Integrated May Include Yield, Soil Fertility P, K, pH, SURGO, CTI, Topography, Tile, Field Boundaries, Soil Productivity Indices And Other Similar Resources


9. Cover Crop and Soil Drainage Management Improvements To Soil Productive Potential. Agronomics, Interactions and Yield Response Data. (Do not include N contribution from cover crops as a point of emphasis as this will be included in the presentation by the N Management Team 5).

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Please ask questions and let Dr. Schweitzer or other participating faculty know if we may be of assistance.

HAVE A GREAT SEMESTER!
Purdue University Academic Honesty Statement. Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.”

Purdue Honor Pledge
“As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue.”

Diversity

All students are valued in the Purdue University community.

EMERGENCY PREPAREDNESS PROCEDURES:

Preparedness will be critical IF an unexpected event occurs! Emergency preparedness is your personal responsibility. Purdue University is actively preparing for natural disasters or human-caused incidents with the ultimate goal of maintaining a safe and secure campus. Let’s review the following procedures:

- To report an emergency, call 911.
- To obtain updates regarding an ongoing emergency, and to sign up for Purdue Alert text messages, view www.purdue.edu/ea
- If we hear a fire alarm, we will immediately suspend class, evacuate the building, and proceed outdoors, and away from the building. Do not use the elevator.
- If we are notified of a Shelter in Place requirement for a tornado warning, we will suspend class and shelter in the lowest level of this building away from windows and doors.
- If we are notified of a Shelter in Place requirement for a hazardous materials release, or a civil disturbance, including a shooting or other use of weapons, we will suspend class and shelter in our classroom, shutting any open doors or windows, locking or securing the door, and turning off the lights.

EMERGENCY PREPAREDNESS WEBSITE:

http://www.purdue.edu/ehps/emergency_preparedness/index.html