

## AGRN 176 - Fall 2024 CROP SCIENCE

### I. General Information

AGRN 176 (Crop Science) is a 4-credit hour course that introduces scientific principles underlying crop production, including: classification and use of major world crops; plant growth and development in response to environment and management; crop pests and pest protection and genetic improvement. 3 hrs. lect.; 2 hrs. lab. *IAI: AG 903*

Lecture: MWF 8:00-8:50 a.m., Knoblauch 152  
Lab (176): 041 - T 8:00-9:50 a.m., Knoblauch 226 or external locations  
042 - T 10:00-11:50 a.m., Knoblauch 226 or external locations

Instructors:	Office Hours:
Dr. Joel Gruver	MW 10-11 am
Office: 302 Knoblauch Hall	F 9-11 am
Phone: 309 298 1215 (office)	
Email: <a href="mailto:j-gruver@wiu.edu">j-gruver@wiu.edu</a>	

Dr. Andrea Venturi	Monday 9-noon
Office: 303 Knoblauch Hall	
Phone: 309-298-1172 (office)	
Email: <a href="mailto:a-venturi2@wiu.edu">a-venturi2@wiu.edu</a>	

No text is required for this class

Useful resources:

McMahon MJ. 2020. Plant Science. Growth, Development, and Utilization of Cultivated Plants. Sixth Edition. Pearson, Hoboken, NJ.

Gerber C, Smith KL. 2014. Corn & Soybean Field Guide. Purdue University Agricultural Communications, West Lafayette, IN

Illinois Agronomy Handbook. University of Illinois Extension C1394. *Many chapters were updated in 2021 and are available for download at <http://extension.cropsci.illinois.edu/handbook>*

All required readings will be made available on Western Online.

### II. University Policies

**Student rights and responsibilities:** A complete description is available at [www.wiu.edu/provost/students](http://www.wiu.edu/provost/students).

**Disruptive Student Policy:** Students who interfere with the ability of other students to learn may be asked to leave the class. After repeated offenses, a student may be removed from the

course. Details may be found at: <http://www.wiu.edu/vpas/policies/disrupst.php>

**Academic Integrity:** <http://www.wiu.edu/policies/acintegrity.php>

Students are expected to abide by WIUs Academic Integrity regulations and policies. Students who engage in plagiarism, cheating or assisting others in any form of dishonesty will be notified. Consequences will vary depending on the transgression and may include an [Academic Integrity Incident Report](#) to the Department Chair and to the Council on Admissions, Graduation, and Academic Standards (CAGAS) for undergraduate students

**Equal Opportunity:** <http://www.wiu.edu/policies/affirmact.php> Western Illinois University complies fully with all applicable federal and state nondiscrimination laws, orders, and regulations. The University is committed to providing equal opportunity and an educational and work environment for its students, faculty, and staff that is free from discrimination based on sex, race, color, sexual orientation, gender identity and gender expression, religion, age, marital status, national origin, disability, or veteran status.

**Disabilities:** In accordance with University values and disability law, students with disabilities may request academic accommodations where there are aspects of a course that result in barriers to inclusion or accurate assessment of achievement. To file an official request for disability-related accommodations, please contact the Disability Resource Center at 309-298-2512, [disability@wiu.edu](mailto:disability@wiu.edu) or in 143 Memorial Hall. Please notify the instructor as soon as possible to ensure that accommodations are provided in a timely manner.

**Education Majors:** The Illinois State Teaching license requires all education majors to receive a grade of a "C-" or better in this course in order to meet its requirements.

### III. Course Expectations and Policies

1. **Show up.** Attendance and punctuality is expected and will be monitored with check-in Qs using the Survey Tool in Western Online. Your first 5 absences (for any reason) will not affect your attendance grade but every additional absence will reduce your attendance grade by 20%. Use the O.A.R.S system (<http://wiu.edu/oars>) to notify the instructor when you are NOT able to attend class. IF you use the OARS system, you may request a link to attend class remotely BUT remote attendance MUST NOT exceed 10 times during the semester. Advance notice via email, phone or face-to-face communication is required if you need to miss a scheduled quiz or exam.
2. **Participate & stay engaged.** You should come prepared and stay engaged by completing assignments, asking and answering questions, taking notes, and working effectively with classmates during group activities. Assignments not turned in when due will lose 10% of the total potential points each day after the due date. During lecture and lab, electronic devices (smart watches, phones, tablet computers, laptop computers, etc.) should only be used for class activities. Inappropriate use of electronic devices may result in loss of attendance credit for that day.
3. **Study.** You will need to spend time outside of lecture and lab each week to optimize your educational experience.
4. **Dress appropriately for lab activities.** Sturdy, close-toed shoes are required for all outdoor activities. Long pants are highly recommended. Weather conditions will vary from week to week and you should adjust your attire accordingly.

5. Live the Golden Rule. Treat others with respect and courtesy!

#### **IV. Course Objectives**

##### Foundational knowledge

1. Develop fluency in basic terminology related to:
  - a. Plant structure
  - b. Plant life cycle, growth and development
  - c. Plant photosynthesis and respiration
  - d. Plant reproduction
  - e. Plant classification
  - f. Weed, disease and insect management
  - g. Soil components and management
2. Identify a wide variety of plant species from seed and plant structures
3. Identify the growth stage of economically important plant species
4. Identify important weed, disease and insect pests

##### Application

5. Classify plants based on taxonomy, life cycle, growth characteristics and use
6. Complete basic calculations important to crop management (e.g., seeding rates, plant populations, growing degree days, yield estimates and fertilizer and pesticide rates).
7. Evaluate crop quality.

##### Integration

8. Explain how abiotic factors (e.g., temperature, light, water, O<sub>2</sub>/CO<sub>2</sub>, and essential plant nutrients) and biotic factors (e.g., weeds, pests, diseases, hormones) impact plant growth and function.
9. Explain how management practices (e.g., variety selection, soil management, water management, planting, pest management, crop rotation, harvest, storage, etc.) affect crop performance
10. Explain how plant breeding and vegetative propagation techniques are used to improve crop potential and utility.

##### Human Dimension

11. Explain how plant domestication modified plant species and impacted humanity
12. Be able to educate others about the revolutionary changes in plant management over the past 200 years and challenges and opportunities pertaining to plant production in the next 20 years

##### Caring

13. Appreciate the diversity and adaptability of plants and their importance in our personal lives and society
14. Value the importance of the scientific method in advancing plant management practices

##### Learning How to Learn

15. Comprehend assigned videos and reading materials
16. Identify reliable resources for future learning about plant science and management

## V. Grading Components and Scale

<u>Grade components</u>	<u>Percentage</u>
Lecture quizzes	30%
Lab	25%
Final exam	20%
Homework	15%
Lecture attendance/participation	10%

### Grading Scale

<u>Percentage</u>	<u>Grade</u>	<u>Percentage</u>	<u>Grade</u>
93.0-100	A	73.0-76.9	C
90.0-92.9	A-	70.0-72.9	C-
87.0-89.9	B+	67.0-69.9	D+
83.0-86.9	B	63.0-66.9	D
80.0-82.9	B-	60.0-62.9	D-
77.0-79.9	C+	<59.9	F

*\*We reserve the right to adjust the weight of the grade components and to make adjustments to the grading scale (e.g., an "A" may begin at 92.5 instead of 93.0), depending upon the general performance of the class.*

## VI. Assessment Metrics

**Lecture quizzes:** There will be ~4 lecture quizzes (~every 3 weeks). Check-in Qs may also be used as mini-pop quizzes.

**Final Exam:** A comprehensive final exam will assess your mastery of course objectives, and will include material covered in lecture and lab.

**Lab:** Your lab grade will be calculated based on attendance and performance on lab quizzes and lab exercises. Lab exercises must be completed and submitted as 1 PDF file using WO before 8 am on the Friday following each lab.

**Homework:** Reading and video Qs will be assigned regularly to reinforce key concepts.

**Participation/Attendance:** Attendance and punctuality are expected and will be monitored with check-in Qs using the Survey Tool in Western Online. Your first 5 absences (for any reason) will not affect your attendance grade but every additional absence will reduce your attendance grade by 20%. Remote attendance is possible BUT you must use the OARS system to notify the instructor (>10 min before the start of class) and must not exceed 10 class sessions.

**Extra Credit:** Extra Credit will also be available for attending events such as ag industry meetings, the School of Ag Career Fair and the School of Agriculture Alumni panel. You will need to write a summary (~1page) of your experience and what you learned to obtain extra

credit.

### VII. Probable Course Calendar

<b>week #</b>	<b>Date</b>	<b>Topic</b>
1	Mon Aug 19	Intro & History of crop production
	Wed Aug 21	History of plant science, part 1
	Fri Aug 23	History of plant science, part 2
2	Mon Aug 26	Macromorphology of plants
	Wed Aug 28	Micromorphology of plants, part 1
	Fri Aug 30	Micromorphology of plants, part 2
3	Mon Sept 2	Labor Day, no class
	Wed Sep 4	Classification of plants
	Fri Sep 6	Quiz 1
4	Mon Sep 9	Weeds
	Wed Sep 11	Vertebrate and invertebrate pests
	Fri Sep 13	Diseases
5	Mon Sep 16	Plant growth and development
	Wed Sep 18	Plant growth regulators
	Fri Sep 20	Environmental factors
6	Mon Sep 23	Plant chemistry and metabolism
	Wed Sep 25	Photosynthesis, part 1
	Fri Sep 27	Photosynthesis, part 2
7	Mon Sep 30	Plant genetics, part 1
	Wed Oct 2	Plant genetics, part 2
	Fri Oct 4	Quiz 2
8	Mon Oct 7	Seeds
	Wed Oct 9	Vegetative propagation
	Fri Oct 11	Fall Break
9	Mon Oct 14	Corn
	Wed Oct 16	Soybeans
	Fri Oct 18	Other grain crops
10	Mon Oct 21	Forage crops
	Wed Oct 23	Industrial crops
	Fri Oct 25	Horticultural crops
11	Mon Oct 28	Harvesting grain crops
	Wed Oct 30	Harvesting other crops
	Fri Nov 1	Quiz 3
	Mon Nov 4	Cropping systems

12	Wed Nov 6	Conservation cropping systems
	Fri Nov 8	Integrated pest management
13	Mon Nov 11	Nutrient management
	Wed Nov 13	Water management
	Fri Nov 15	Soil health
14	Mon Nov 18	World food security
	Wed Nov 20	Quiz 4
	Fri Nov 22	Crop Science related movie
15	Nov 25-29	Thanksgiving Break
16	Mon Dec 2	Future of crop production, part 1
	Wed Dec 4	Future of crop production, part 2
	Fri Dec 6	Review
17	Mon Dec 9	Final exam (8-10 am)