

AGRN 472
- Principles of Plant Breeding –

INSTRUCTOR: Dr. Win Phippen
310 KH
Office Phone: 298-1251
Home Phone: 833-4873
wb-hippen@wiu.edu

CLASS: Monday and Wednesday, 1:00-1:50pm KH 305

LABORATORY: Thursday, 1:00-2:50pm KH 305/KH 301

CREDITS: 3 hours

OFFICE HOURS: Mon. and Wed. 11-12:00pm, Thurs. 10-12:00pm or by appointment

REQUIRED TEXT:

Breeding Field Crops, 5th Edition. 2006. By David A. Sleper and John M. Poehlman

SUGGESTED TEXT:

Plants, Genes, and Crop Biotechnology, 2nd Edition. 2003. By Maarten J. Chrispeels and David A. Sadava

COURSE DESCRIPTION: This is as an upper level course for students with an interest in learning how crop plants can be improved by altering their genetic make-up through traditional approaches. The course covers methodology, theory, and applications with particular emphasis on integrating the various approaches to achieve overall crop improvement goals. The course will cover the methods of gene transfer by sexual hybridization including the founding principles and methods of conventional plant breeding. Asexual methods of gene transfer will also be discussed. The course will also explore the use of cell and tissue culture methods such as sterile propagation, embryo rescue, and protoplast fusion techniques. Finally, we will cover government regulations, public concerns, and legal protection of improved crops.

GRADING: There will be 2 midterm examinations, each worth 100 pts and a cumulative final exam worth 200pts. Two quizzes will be given during each section worth 25 pts each. Students will also be required to write a 5-page term paper and present their papers in front of the class. (term paper = 100pts; presentation= 50pts). Attendance and participation in class discussions will count for 100 points.

Total points possible = 750 points.

EXAM I	100 pts.	750 - 675 = A
EXAM II	100 pts.	674 - 600 = B
FINAL EXAM	200 pts.	599 - 525 = C
4 Quizzes (25pts. each)	100 pts.	524 - 450 = D
Student paper	100 pts.	< 449 = F
Student presentation	50 pts.	
<u>Attendance and Participation</u>	100 pts.	
Total Points = 750 pts.		

MAKE-UP EXAMS: Make-up exams are only available if you are excused due to a university sponsored function (example: required field trip, athletic competition, etc.) or verified illness or death in the family. Advance notice, when possible is expected, and if applicable, a physician's written verification of illness is required.

ATTENDANCE: Participation from all the students in discussions is critical to the learning process. Attendance will be taken at each class and laboratory meeting. Each student will be allowed two excused absences with PRIOR PERMISSION of the instructor. Any other absences will result in a deduction of 10 points each. Participation and attendance will count for 100 pts towards your final grade.

FIELD TRIPS: There will be a three scheduled field trips during the semester. The trips will be scheduled on Thursdays and will usually take up the entire day or most of the afternoon. If you have a scheduling conflict with another class, you will be responsible for making up any missed work.

ACADEMIC HONESTY: You are encouraged to work with your classmates in class and laboratory and study together in groups. However, exams must be completed independently. You are expected to maintain academic honesty as stated by the University. See <http://www.wiu.edu/policies/acintegrity.php>

STUDENTS WITH DISABILITIES: Students with 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 or in 143 Memorial Hall. Please notify the instructor as soon as possible to ensure that this course is accessible to you in a timely manner.

UNIVERSITY VALUES: Title IX, and other federal and state laws prohibit sex discrimination, including sexual assault/misconduct, dating/domestic violence, and stalking. If you, or someone you know, has been the victim of any of these offenses, we encourage you to report this to the Title IX Coordinator at 309-298-1977 or anonymously online at: http://www.wiu.edu/equal_opportunity_and_access/request_form/index.php. If you disclose an incident to a faculty member, the faculty member must notify the Title IX Coordinator. The complete Title IX policy is available at: <http://www.wiu.edu/vpas/policies/titleIX.php>.

Attention Education Majors:

The changes within the state teaching license require all education majors to receive a grade of a "C" or better in this course in order to meet these new requirements. With the university +/- grading system, receiving a "C-" or below will require you to retake this course or find a substitute course to meet School of Agriculture graduation requirements.

** This is a tentative course outline and may be subject to change.

LECTURE, LABORATORY, AND EXAM SCHEDULE:

Date	Lecture Topic	Chapters
1/18, Wed.	Introduction to Plant Breeding	Chp 1.
1/19, Thurs.	LAB 1- Term Project	
1/23, Mon.	Genetic Variation and Gene Recombination	Chp 3.
1/25, Wed.	Quantitative Inheritance	Chp 4.
1/26, Thurs.	Seed processing - LAB	
1/30, Mon.	Heritability	Chp 4.
2/1, Wed.	Quiz 1- Chromosome numbers	(Chps. 1,3,4 & Notes) Chp 5.
2/2, Thurs.	Mutation breeding - LAB	Chp 6.
2/6, Mon.	Fertility regulation	Chp 7.
2/7, Wed.	Breeding self-pollinated crops	Chp 9.
2/8, Thurs.	Plant factories - LAB	
2/13, Mon.	Breeding Programs	Notes
2/15, Wed.	Student projects	
2/16, Thurs.	Reproduction in plants – LAB - flower structure	Chp 2.
2/20, Mon.	Clonal propagation	
2/22, Wed.	Clonal propagation	
2/23, Thurs.	Micropropagation - LAB	
2/27, Mon.	Breeding cross-pollinated crops	Chp 10.
3/1, Wed.	Quiz 2 - cross-pollinated crops	Chps. 2,5-7, 9-10 & Notes
3/2, Thurs.	Field Trip – U of I – All Day	
3/6, Mon.	Hybrid production	Chp 11.
3/8, Wed.	Exam review	
3/9, Thurs.	EXAM I	Chps. 1-7, 9-11 & Notes
3/13-17	No Class - Spring Break	
3/20, Mon.	Breeding objectives	Chp 12.
3/22, Wed.	Germplasm resources	Chp 13.
3/23, Thurs.	GRIN exercise – LAB	
3/27, Mon.	Breeding for physiological and morphological traits	Handout
3/29, Wed.	Quiz 3 - Breeding for resistance to insect and diseases	12-13 & Notes, Handout
3/30, Thurs.	Gas Chromatography laboratory - LAB	
4/3, Mon.	Breeding for abiotic stresses	Handout
4/5, Wed.	Breeding for compositional traits and added value	Handout
4/6, Thurs.	Field Trip -- Pioneer, Adair 1-3pm	
4/10, Mon.	Plant tissue culture	Chp. 8
4/12, Wed.	Quiz 4 - Plant tissue culture	Chp. 8 & Notes
4/13, Thurs.	Embryo rescue – LAB	
4/17, Mon.	Interspecific hybridization	
4/19, Wed.	Protoplast fusion	
4/20, Thurs.	Field Trip – Pioneer, Good Hope 1-3pm	
4/24, Mon.	Seed production	Chp 23.
4/26, Wed.	Exam review - Variety protection	
4/27, Thurs.	EXAM II	Chps. 8, 12-13,23, Notes
5/1, Mon.	Student Projects	
5/3, Wed.	Student Projects	
5/4, Thurs.	Student Projects and Review	
5/10, Wed.	FINAL EXAM, KH 305, 1:00pm	Cumulative