Fall 2009

AGRI-376

- Applied Genetics in Agriculture -

INSTRUCTOR: Dr. Win Phippen
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CLASS: MW 1:00-1:50 KH 305

LAB1: TH 1:00-2:50 KH 305
LAB2: TH 3:00-4:50 KH 305

CREDITS: 3 hours

OFFICE HOURS: MW 11:00-12:00, TH 10:00-12:00 or by appointment.

TEXT: Essentials of Genetics, 6th ed. 2006. Klug and Cummings. ISBN: 0132241277

COURSE DESCRIPTION: This course is designed for Agriculture majors who are interested in developing their basic understanding of genetics, along with learning about the techniques and implications of manipulating genes in plant and animal systems. With the recent advances in cloning and genetic engineering, understanding the genetics and the current molecular technology in genetics is critical for agriculture majors dealing with concerns of genetically modified organisms. It is also critical for agriculture majors to consider and understand the social implications of manipulating genes. An emphasis will be placed on plant systems. Students will develop a basic understanding of: Mitosis and meiosis, DNA structure and replication, RNA transcription and protein translation, principles of classical genetics, control of gene expression, DNA mutations, methods for assessing genetic diversity, recent developments in genetic technology, and social implications of manipulating genetic information in agricultural organisms.

GRADING: Four quizzes will be given throughout the semester each worth 25 pts. There will also be three midterm exams after each section, each worth 100 pts and a final exam worth 200pts. Student groups will be required to present a brief genetics paper in front of the class and hand-in a single one page summary of their presentation. The presentation and paper are worth 100 pts. Attendance and participation in class discussions will count for 100 points. Total points possible = 800 points.

Quizzes (4 x 25pts/ea)	100 pts.	800 - 720 = A
EXAM I	100 pts.	719 - 640 = B
EXAM II	100 pts.	639 - 560 = C
EXAM III	100 pts.	559 - 480 = D
FINAL EXAM	200 pts.	< 479 = F
Group presentation	100 pts.	
Attendance and Participation	100 pts.	
Total Points = 800 pts.		

LECTURE, LABORATORY AND EXAM SCHEDULE:

Date	**Lecture Topic**	**Chapters**
8/24, Mon.	Introduction to genetics	
8/26, Wed.	History of Genetics	Chp. 1 p. 1-14
8/27, Thur.- LAB 1	Genetics overview video, Fast Plants	
8/31, Mon.	Cell and Chromosome structure	Chp. 2 p. 18-22, Chp.11 p. 236-245
9/2, Wed.	Mitosis	Chp. 2 p. 23-26
9/3, Thur.- LAB 2	Mitosis-onion, Genetics Video	
9/7, Mon.	**Labor Day – No Class**	
9/9, Wed.	**QUIZ** - Meiosis	Chp. 2 p. 26-34
9/10, Thur.- LAB 3	Mendelian genetics	Video, Handout
9/14, Mon.	Mono, dihybrid cross	Chp. 3 p. 39-52
9/16, Wed.	Probability, Extens. of Mend. genetics	Chp . 4 p. 62-86
9/17, Thur.- LAB 4	Probability and statistics	Handout
9/21, Mon.	Chromosome mapping, genetic approaches	Handout, Group topic **DUE**
9/23, Wed.	EXAM I Review	
9/24, Thur.- LAB 5	**EXAM I**	**Chapters 1-4, 11 & Handouts**
9/28, Mon.	DNA structure	Chp. 9 p. 189-209
9/30, Wed.	DNA structure	
10/1, Thur.- LAB 6	DNA structure and extraction	
10/5, Mon.	**QUIZ** - RNA	
10/7, Wed.	DNA replication	Chp. 10 p. 215-230.
10/8, Thur.- LAB 7	Student project library research	
10/12, Mon.	DNA replication	Telomerase Story pg 231
10/14, Wed.	DNA replication	
10/15, Thur.- LAB 8	Inheritance Study – planting	
10/19, Mon.	Transcription	Chp. 12 p. 254-271, Antisense p. 272
10/21, Wed.	Translation	Chp. 13 p. 277-297
10/22, Thur.- LAB 9	Translation lab	
10/26, Mon.	Translation/Proteins	Mad Cow p. 297-298
10/28, Wed.	**QUIZ** – Mutations	Chp. 14 p 303-323, Chernobyl p. 324
10/29, Thur.- LAB 10	Genes to Proteins – gene control	
11/2, Mon.	Regulation of genes	Chp. 15 p. 330-344
11/4, Wed.	EXAM II review	
11/5, Thur.- LAB 11	**EXAM II**	**Chapters 9-10, 12-15**
11/9, Mon.	Recombinant DNA technology	Chp. 17 p. 377-392, Chp. 18 review
11/11, Wed.	Applications of genetics	Chp. 19 p. 426-443
11/12, Thur.- LAB 12	Livestock Cloning Video	
11/16, Mon.	**QUIZ** - Genetics in Ag and industry	Chp. 27 (handout)
11/18, Wed.	Trends in Biotechnology	
11/19, Thur.- LAB 13	DNA fingerprinting	
11/23-11/27	**Fall Break**	
11/30, Mon.	Legal issues facing genetics	Chp. 28 (handout)
12/2, Wed.	Exam III review	
12/3, Thur.- LAB 14	**EXAM III**	**Chapters 17-19, 27-28** (handouts)
12/7, Mon.	Student presentations	
12/9, Wed.	Student presentations	
12/10, Thur.- LAB 15	Final Review	
12/16, Wed.	**FINAL EXAM, KH 305, 1:00pm**	**Cumulative**

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. Advanced notice, when possible is expected, and if applicable, a physician's written verification of illness is required.

ATTENDANCE AND PARTICIPATION: This course is now required for many students to complete their major. Participation from all the students in discussions is critical to the learning process. Attendance will be taken at each class and laboratory meeting. Participation and attendance will count for 100 pts towards your final grade.

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.

In accordance with University policy and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as he/she is not legally permitted to inquire about such particular needs of students. Students who may require special assistance in emergency evacuations (i.e. fire, tornado, etc.) should contact the instructor as to the most appropriate procedures to follow in such an emergency. Contact Disability Support Services at 298-2512 for additional services.

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