

**AGRI-376****- Applied Genetics in Agriculture -**

INSTRUCTOR: Dr. Win Phippen  
 310 Knoblauch Hall  
 Office Phone: 309-298-1251  
 Home Phone: 309-833-4873  
 WB-Phippen@wiu.edu

CLASS: MW 1:00-1:50 Union Heritage rooms  
 LAB1: TH 12:00-1:50 KH 207  
 LAB2: TH 3:00-4:50 KH 207

CREDITS: 3 hours

OFFICE HOURS: MW 12:00-1:00, TH 10:00-12:00 or by appointment.

TEXT: Essentials of Genetics, 9<sup>th</sup> ed. 2016. Klug, Cummings, Spencer, and Palladino.  
 ISBN: 0134047796

**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, genetic engineering and gene editing, 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. 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 2-page summary of their presentation with references. The presentation and paper are worth 100 pts. Homework will count for 50 points, while attendance and participation in class discussions will count for 100 points.

Quizzes (4 x 25pts/ea)	100
EXAM I	100
EXAM II	100
EXAM III	100
FINAL EXAM	200
Group Project	130
Homework	50
Attendance and Participation	100
<b>Total Points</b>	<b>880</b>

880 – 836	A
835 - 792	A-
791 - 766	B+
765 – 722	B
721 - 704	B-
703 - 678	C+
677 - 634	C
633 - 616	C-
615 - 599	D+
598 - 554	D
553-528	D-
< 527	F

## COURSE POLICIES

Your enrollment and attendance in this course automatically subjects you to course policies that have been established by the University. It is the STUDENT'S RESPONSIBILITY to follow the course policies. Brief descriptions of these policies are listed below. The University Handbook will be followed in cases where further clarification is needed. See <http://www.wiu.edu/provost/students.php>

**PERSONAL HABITS:** Some personal habits are distracting to others in the classroom and are disallowed. They include, but may not be limited to: holding conversations with others during lecture, text messaging, making or receiving phone calls, using personal electronic devices for gaming, using tobacco products, etc. Please respect those around you and limit these practices to personal time. You will be asked to leave the class if these habits are not controlled. See <http://www.wiu.edu/vpas/policies/disrupst.php>.

**MAKE-UP EXAMS AND QUIZES:** 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. No make-up quizzes will be offered.

**HOMEWORK:** Presentations, papers, and homework **MUST BE TYPED** and handed in electronically at the beginning of the class period on the due date. Anything later will be considered late. Late papers will lose 10% of the grade for each day turned in late (including the day of class if you skip class that day).

**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. Each student will be allowed two excused absences with **PRIOR PERMISSION** of the instructor. Any other absences will result in a deduction of 5 points for each lecture and 10 points for each laboratory. Participation and attendance will count for 100 pts towards your final grade. If at any time you have a family emergency, funeral, or just not feeling well, please use the OARS system to report your absence ([www.wiu.edu/oars](http://www.wiu.edu/oars)).

**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](mailto: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](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 Illinois teaching license requirements. With the university +/- grading system, receiving a "D+" or below will require you to retake this course or find a substitute course to meet School of Agriculture graduation requirements.

## LECTURE, LABORATORY AND EXAM SCHEDULE:

Date	Lecture Topic	Chapters, Due Dates
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	
8/31, Mon.	Cell and Chromosome structure, Mitosis	Chp. 2 p. 18-22, Chp.11 p. 225-232
9/2, Wed.	Meiosis	Chp. 2 p. 23-34, <b>Home work #1 DUE</b>
9/3, Thur.- LAB 2	Mitosis-onion, Genetics Video	
<b>9/7, Mon.</b>	<b>Labor Day – No Class</b>	
9/9, Wed.	<b>QUIZ</b> - Mono, dihybrid cross	Chp. 3 p. 38-52
9/10, Thur.- LAB 3	Mendelian genetics, natural selection	Pond exercise, Handout
9/14, Mon.	Probability, Extens. of Mend. genetics	Chp. 4 p. 62-83, <b>Home work #2 DUE</b>
9/16, Wed.	Chromosome mapping, genetic approaches	Handout
9/17, Thur.- LAB 4	Probability and statistics, simple traits	Handout
9/21, Mon.	DNA structure	Chp. 9 p. 182-200, <b>Group topic DUE</b>
9/23, Wed.	DNA structure and EXAM I Review	
<b>9/24, Thur.- LAB 5</b>	<b>EXAM I</b>	<b>Chapters 1-4, 11 &amp; Handouts</b>
9/28, Mon.	RNA	
9/30, Wed.	DNA replication	Chp. 10 p. 204-220.
10/1, Thur.- LAB 6	DNA structure and extraction	
10/5, Mon.	<b>QUIZ</b> - DNA replication	
10/7, Wed.	DNA replication	Telomerase pg 221 <b>Home work #3 DUE</b>
10/8, Thur.- LAB 7	Inheritance Study – planting	
10/12, Mon.	Transcription	Chp. 12 p. 241-257, RNAi p. 257
10/14, Wed.	Translation	Chp. 13 p. 262-280
10/15, Thur.- LAB 8	Translation lab	
10/19, Mon.	Library search – Genetic techniques	
10/21, Wed.	Student Projects – Agriculture application	
10/22, Thur.- LAB 9	Student Projects - Outline	<b>Project Outline- DUE – 10/26</b>
10/26, Mon.	Translation/Proteins	
10/28, Wed.	<b>QUIZ</b> – Mutations	Chp. 14 p 285-303
<b>10/29, Thur.-LAB 10</b>	Genes to Proteins – gene control	
11/2, Mon.	Regulation of genes, promoters	Chp 15 p308-329, <b>Home work #4 DUE</b>
11/4, Wed.	EXAM II review	
11/5, Thur.- LAB 11	<b>EXAM II</b>	<b>Chapters 9-10, 12-15</b>
11/9, Mon.	Recombinant DNA technology	Chp. 17 p. 351-369, Chp. 18 review
11/11, Wed.	Applications of genetics	Chp. 19 p. 425-444
11/12, Thur.- LAB 12	Livestock Cloning Video	
11/16, Mon.	<b>QUIZ</b> - Genetics in Ag and industry	Chp 27 (handout), <b>Home work #5 DUE</b>
11/18, Wed.	Trends in Biotechnology	
11/19, Thur.- LAB 13	DNA fingerprinting	
<b>11/23-11-27</b>	<b>Fall Break</b>	
11/30, Mon.	Legal issues facing genetics	Chp. 28 (handout)
12/2, Wed.	Exam III review	
<b>12/3, Thur.- LAB 14</b>	<b>EXAM III</b>	<b>Chapters 17-19, 27-28 (handouts)</b>
12/7, Mon.	Student presentations	
12/9, Wed.	Student presentations	
12/10, Thur.- LAB 15	Student presentations , Final Review	
<b>12/16, Wed.</b>	<b>FINAL EXAM, Heritage room, 1:00pm</b>	<b>Cumulative</b>

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

## **Course Adjustments Due to Pandemic**

- Facial masks must be worn in class – no exceptions.
- Attendance will be taken for face to face classes to assist with contact tracing should this become necessary.
- Best way to get in touch with me is through email. I will respond to emails as quickly as I can.
- All assignments will be completed online. No hardcopy of assignments will be accepted.
- All assignments will be graded electronically.
- No hardcopies of excuse letters/Drs. notes will be accepted. If you need to provide a copy to me, scan it or take a picture of it and email it to me at [wb-hippen@wiu.edu](mailto:wb-hippen@wiu.edu)
- For help with any assignments, email your content and question to me rather than bringing in your computer.
- In person office hours will still be available but virtual meetings will be preferred.
- All quizzes and exams will be in-person until further notice.
- Student presentations will occur during the last week of class. Students are encouraged to use Zoom to give their live presentations.

## **Potential Disruptions to Face-to-Face Classes**

- It is the intent of WIU to offer face-to-face classes where possible throughout the fall.
- There is also a risk that the university will have to return to all online course before the semester is over.
- Any disruptions requiring me to move my classes to an online format (whether briefly or for an extended period) I will handle all lectures through zoom.

## **Positive Actions You Can Take**

- Wear your masks when around others and encourage others to do the same.
- Wash your hands frequently.
- Think about the risk of social interactions with others – minimize as much as possible.
- Understand we are all in this together. Have patience with everyone as we adjust to this change in our environment.

### *Policy on Face Coverings in the Classroom*

All students and faculty are required to wear a face covering at all times in the classroom.

Western Illinois University will provide two (2) cloth face coverings to all instructors and students, and replace them when necessary. Individuals may use a personally purchased alternative face covering as appropriate.

Employees and students are responsible for laundering their reusable cloth face coverings. It is the responsibility of University units to ensure compliance from employees and students under their purview. Units can also refer to the Centers for Disease Control and Prevention (CDC) guidance on face coverings with regard to type and fit, wearing, and washing. Additionally, no food or drink will be allowed in the classroom.

Please find a more detailed explanation of this policy at: [http://www.wiu.edu/policies/covid\\_facecovering.php](http://www.wiu.edu/policies/covid_facecovering.php)

### *Disciplinary Policy on Refusal to Wear a Face Covering*

Exceptions to the policy require approval by WIU's Disability Resources Center (DRC) located within the Student Development and Success Center (SDSC) and the Office of Equal Opportunity and Access.

If a student refuses to comply with the policy, and does not have appropriate approval from the DRC, instructors and University officials can request that the student leave the class or activity. If a student is found to be in repeated violation of this policy, instructors and University officials can sanction the student through the student conduct process for violating the WIU Code of Student Conduct code number 17: "Failing to comply with the directions of or obstructing University officials or law enforcement officers acting in performance of their duties and/or failure to positively identify oneself to these persons when requested to do so."