

Advanced Genetics (Biology 6342) Course Schedule

Spring 2022

Dr. Loren K. Ammerman

Office: CAV 003B

Office hours: MW 10-12, T 10:30-12, W 1-2 pm and by appointment

E-mail: loren.ammerman@angelo.edu

Phone: 325-486-6643

COURSE DESCRIPTION: The study of recent advances in genetics with an emphasis on modern methods of analysis and applications such as genetic testing, conservation genetics, PCR, microarray technology, cloning, and forensic genetics. Familiarity with general principles of genetics is desirable. *Prerequisites: Bio 3301 (Genetics) or similar course.*

STUDENT LEARNING OUTCOMES: The student will be able to discuss and present ideas on current research in the field of genetics. The student will be assessed by the ability to present (written and oral) their critical evaluation of selected topics in the current literature.

MEETING TIME AND PLACE: 5:00 - 6:15 pm, Tues/Thurs, Cavness 111

REQUIRED TEXTBOOK: none; assigned readings will be provided

GRADING: Students will earn a grade based on two exams (midterm and final) (50%), one oral paper presentation (20%), discussion paper summaries (20%), and one written assignment (10%). Grades will be assigned based on the following scale – No exceptions — 90-100%=A, 80-89%=B, 70-79%=C, 60-69%=D, below 60%=F

INSTRUCTION: Both lecture and seminar format will be used. Selected readings will be presented by class members at various times throughout the semester. The designated presenter will be responsible for leading the class discussion however all students are expected to participate.

ATTENDANCE: You are expected to attend all lecture periods. ***Students with 4 or more unexcused absences will lose 10 percentage points (equivalent to a letter grade) off their final grade.*** If you encounter a problem attending classes, please contact the instructor as soon as possible.

MAKE-UP POLICY: If you miss an exam, you must notify me within 24 hours of the missed exam (by phone, e-mail or in person). Also, the absence must be a legitimate excuse, i.e. a death in your family, personal illness, or a university-sponsored event. A make-up exam will be scheduled to be taken as soon as possible.

EXAM DATES (mark them on your calendars now):

Exams will be essay format and include a take-home portion. During the exam you may consult articles discussed in class and your class notes.

Midterm	8 March 2022 and 10 March 2022
Final Exam	10 May 2022, 6:00-8:00pm

GENERAL POLICIES RELATED TO THIS COURSE

All students are required to follow the policies and procedures presented in these documents:

- [Angelo State University Student Handbook](#)ⁱ
- [Angelo State University Catalog](#)ⁱⁱ

Academic Integrity

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university's [Statement of Academic Integrity](#).ⁱⁱⁱ

Accommodations for Students with Disabilities

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student's responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the [Student Disability Services website](#).^{iv} The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dr. Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112

Incomplete Grade Policy

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 [Grading Procedures](#)^v for more information.

Drop Policy

The last day to drop the course is determined by the [university calendar](#)^{vi} (Thursday, 28 April, 5:00pm). Please come talk with me if you are considering dropping the course.

Plagiarism

Plagiarism is a serious topic covered in ASU's [Academic Integrity policy](#)^{vii} in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off as one's own. Plagiarism is literary theft.

In your lab report papers, it is unacceptable to copy word-for-word even when a source is cited. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list. Similarly, it is unacceptable for a student to use another student's written words and submit them for credit.

Papers are subject to be evaluated for originality. Resources to help you understand this policy better are available at the [ASU Writing Center](#).^{viii}

Student Absence for Observance of Religious Holy Days

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 [Student Absence for Observance of Religious Holy Day^{ix}](#) for more information.

Title IX at Angelo State University

Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Miller, J.D. You may submit reports in the following manner:

Online: [Incident Reporting Form^x](#)

Face to Face: Mayer Administration Building, Room 210

Phone: 325-942-2022

Email: michelle.miller@angelo.edu

Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171).

For more information about resources related to sexual misconduct, Title IX, or Angelo State's policy please visit the [Title IX website^{xi}](#).

Information About COVID-19

Please refer to ASU's [COVID-19 \(Coronavirus\) Updates^{xii}](#) web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

PAPER PRESENTATIONS

Each student will select a research article (not a review article) for the entire class to read and discuss. The topic of your paper is up to you as long as it is a research paper in genetics. The paper **must include** figures and/or graphic representations of results and must have been published in the past 5-6 years. Your paper will need to be approved by Dr. Ammerman. An expanded written assignment over **YOUR SELECTED** paper will be due ONE WEEK before your presentation date and will constitute 10% of your course grade.

Specifically, you will be required to answer the following five questions thoroughly. Your answers should use your own wording and be written neatly or typed.

1. What was the **objective** of this paper? What hypothesis/hypotheses were being tested?
2. How did the authors test the hypothesis? In other words, what type of data did they collect? What **methods** were used? Why?

3. List or briefly summarize the **results** of the study.
4. State their **conclusion**. Did their results support or reject their hypothesis? Were alternative hypotheses excluded?
5. What do you think should be the next step in their investigation? Do the authors recommend a future course of study?

Please provide a clear pdf copy of the paper you have selected to Dr. Ammerman at least ONE WEEK before your presentation date so that it can be made available to the class via the Blackboard website.

Everyone is required to read the selected paper before the date of the class discussion. To help you prepare for discussions you might consider the following topics/questions: you should be prepared to comment on the strengths and weaknesses of the study, evaluate the methods, ask questions about the methods, evaluate the figures, provide criticism of the study, determine the major contribution of the study, decide what you think should be the next step, and/or provide your own interpretation of the data. To help organize the information in each paper, you will be required to answer the 5 questions above for all papers. Your answers will be submitted at the beginning of each presentation day. Grading of these assignments (discussion paper summaries) will be explained in class and is described on the next page.

GRADING PARAMETERS FOR ORAL PRESENTATIONS

You will have about 20 minutes to introduce your paper and about 30-40 minutes for class discussion. We will evaluate your preparedness, presentation, understanding of the subject matter, organization, and ability to answer and ask questions.

Your oral presentation will be graded using the criteria on the last page of this syllabus. Each student will evaluate your presentation. Your grade will be determined by an average of the class evaluation score (after lowest and highest grades are discarded) and Dr. Ammerman's score. This grade will constitute 20% of your course grade.

GRADING PARAMETERS FOR DISCUSSION PAPER SUMMARIES

Each person is expected to read all of the papers presented in class. On the day the paper is discussed in class you must submit answers to the five questions on page 3 and 4 of this syllabus. Each set of answers must not be longer than 850 words total. You may choose to allot more words to one answer than another as you see fit but the total words used cannot exceed 850. Answers should be typed and be single-spaced. *When you present YOUR SELECTED PAPER, the written summary can be longer but should not be longer than 1500 words.*

Your answers should be in your own words (i.e. do not copy sentences from the paper and do not submit a collaborative answer). Conciseness is important (i.e. the more information packed into less words, the better). Insight is important (i.e. you see/understand things others did not) and, if necessary, include ancillary literature research (i.e. do not copy words from the paper if you do not know what they mean--look them up and answer accordingly). All sections of each question must be thoroughly answered.

I will evaluate your answers and they will be categorized as follows: The top quartile will receive a 95%, the next quartile will receive a 90%, the next quartile will receive 85%, and the last quartile will receive 80%. An answer substantially inferior to the last quartile will receive a 70%. Failure to answer will receive a 0%.

The average grade that you receive on all discussion paper summaries will constitute 20% of your course grade.

TENTATIVE SEQUENCE OF LECTURE TOPICS / PRESENTATIONS

Date	Topic
Jan 18:	Introduction to course
Jan 20:	Review of molecular genetics
Jan 25:	Genetic databases and bioinformatics
Jan 27:	Paper Presentation/Discussion – eDNA
Feb 1:	Use of microsatellites in forensics & other applications
Feb 3:	Student paper presentation - 1
Feb 8:	Conservation genetics
Feb 10:	Systematics and Genetic Species Concept
Feb 15:	Extranuclear genomes
Feb 17:	Student paper presentation - 2
Feb 22:	Genetic databases and bioinformatics
Feb 24:	Student paper presentation - 3
Mar 1:	Student paper presentation - 4
Mar 3:	Genetic approaches to ecology
Mar 8:	MIDTERM EXAM (part 1)
Mar 10:	MIDTERM EXAM (part 2)
Mar 15 and 17:	NO CLASS – SPRING BREAK
Mar 22:	Guest lecture: Chromosomal evolution – Dr. Robert Dowler
Mar 24:	Student paper presentation - 5
Mar 29:	Guest lecture: Genomic architecture – Dr. Wes Brashear
Mar 31:	Cancer Genetics
Apr 5:	Guest lecture: Patient genetics and microbiome of wounds – Craig Tipton
Apr 7:	Student paper presentation - 6
Apr 12:	CRISPR and gene editing
Apr 14:	Sex determination genes in mammals
Apr 19:	Comparative genomics/Metagenomics
Apr 21:	Student paper presentation - 7
Apr 26:	Genetics of longevity
Apr 28:	Student paper presentation - 8
May 3:	Medical genetics
May 5:	Stress and genetics
May 10 (T):	FINAL EXAM (6:00-8:00 pm)

Exams will cover all of the material up to the last class day before the test unless told otherwise.
Exams will be primarily short-answer/essay format, but multiple-choice/matching could also be used.
During the exam you may consult articles discussed in class and your class notes.

BIOLOGY 6342 – Presentation Evaluation

Speaker : _____ Date: _____

Knowledge and depth of understanding of the topic 1= poor 5 = excellent

The speaker:	• had a thorough understanding of his/her subject	1	2	3	4	5
	• used clear examples to help me understand the subject	1	2	3	4	5
	• used appropriate vocabulary, defined technical terms	1	2	3	4	5
	• presented experimental methods clearly	1	2	3	4	5
	• appeared prepared	1	2	3	4	5

Organization

The speaker:	• adequately covered the topic within the allotted time	1	2	3	4	5
	• had a logical overall organizational sequence	1	2	3	4	5
	• stressed the main ideas	1	2	3	4	5
	• made distinct but smooth transitions between main ideas	1	2	3	4	5

Use of references

The speaker:	• integrated and gave credit to others' work	1	2	3	4	5
	• included background from <i>at least</i> one outside reference	1	2	3	4	5

Use of visuals

The speaker:	• presented <i>at least</i> one data table or graph (figure)	1	2	3	4	5
	• explained the visuals appropriately	1	2	3	4	5
	• presented legible, relevant visuals	1	2	3	4	5

Delivery of the information

The speaker:	• used an appropriate volume and rate of delivery	1	2	3	4	5
	• maintained eye contact with the audience	1	2	3	4	5
	• presented a professional, enthusiastic demeanor	1	2	3	4	5

Discussion

The speaker:	• answered questions with confidence	1	2	3	4	5
	• provided accurate, understandable answers	1	2	3	4	5
	• led a discussion of the main results and conclusions	1	2	3	4	5

TOTAL POINTS:

COMMENTS:

Please provide specific, constructive criticism concerning this presentation/presenter.

Your name: _____ Date: _____

-
- i <https://www.angelo.edu/current-students/student-handbook/>
 - ii <https://www.angelo.edu/academics/catalog/>
 - iii <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=97>
 - iv <https://www.angelo.edu/current-students/disability-services/>
 - v <https://angelo.policystat.com/policy/10659448/latest/>
 - vi http://www.angelo.edu/services/registrars_office/academic_calendar.php
 - vii <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96>
 - viii https://www.angelo.edu/current-students/writing-center/academic_honesty.php
 - ix <https://angelo.policystat.com/policy/10659368/latest/>
 - x <https://www.angelo.edu/incident-form>
 - xi <https://www.angelo.edu/title-ix>
 - xii <https://www.angelo.edu/covid-19/>