Advanced Genetics (Biology 6342) Course Schedule
Spring 2019
Dr. Loren K. Ammerman

Office: CAV 003B
Office hours: MWF 9-11, TR 11-12, and by appointment
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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: 11:00 am - 12:15 pm, Mon/Wed, 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 (25%), discussion paper summaries (15%), 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 3 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.

ACADEMIC HONESTY: All students are expected to conform to college-level standards of ethics, academic integrity, grammar and spelling. In particular, by enrolling in this class you agree to adhere to the University Honor Code published in the ASU Student Handbook which can be found on the ASU webpage. Group interactions, investigations, and studying are encouraged; however, duplicate work, in which more than one person (including proxy submissions) claims credit for essentially the same material, will be treated as cheating and will receive a grade of zero for the assignment(s) in question.

AMERICANS WITH DISABILITIES ACT: Persons with disabilities which may warrant academic accommodations must contact the Student Life Office, Room 112 University Center, in order to request such accommodations prior to any accommodations being implemented. You are encouraged to make this request early in the semester so that appropriate arrangements can be made. It is the responsibility of the student to inform us at the beginning of the semester and provide authorized documentation through designated administrative channels.

DROP POLICY: The last day to drop follows the university calendar and is 28 March 2019.
EXAM DATES (mark them on your calendars now):
Midterm 4 March 2019
Final Exam 8 May 2019, 10:30am

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 gel images 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 25% 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 of the 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 15% of your course grade.
### SEQUENCE OF LECTURE TOPICS / PRESENTATIONS

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Jan 14</td>
<td>Introduction to course</td>
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<tr>
<td>Jan 16</td>
<td>Review of genetics</td>
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<td>Jan 21</td>
<td>MLK Holiday</td>
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<td>Jan 23</td>
<td>DNA sequencing methods</td>
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<td>Jan 28</td>
<td>Methods for studying gene expression</td>
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<td>Jan 30</td>
<td>Use of microsatellites in forensics &amp; other applications</td>
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<td>Feb 4</td>
<td>Conservation genetics</td>
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<td>Feb 6</td>
<td>Applications of molecular systematics</td>
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<td>Feb 11</td>
<td>Paper Discussion – LKA</td>
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<td>Feb 13</td>
<td>Extranuclear genomes</td>
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<td>Feb 18</td>
<td>Student paper presentation – TBD</td>
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<td>Feb 20</td>
<td>Genetic databases and bioinformatics</td>
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<td>Feb 25</td>
<td>Student paper presentation – TBD</td>
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<td>Feb 27</td>
<td>Genetic approaches to ecology</td>
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<td>Mar 4</td>
<td>MIDTERM EXAM (part 1)</td>
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<td>Mar 6</td>
<td>MIDTERM EXAM (part 2)</td>
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<td>Mar 11 and 13</td>
<td>NO CLASS – SPRING BREAK</td>
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<td>Mar 18</td>
<td>Guest Lecture – Laramie Lindsey, TTU, Department of Biological Sciences</td>
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<td>Mar 20</td>
<td>Student paper presentation – TBD</td>
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<td>Mar 25</td>
<td>Role of gene expression in human cancers</td>
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<td>Mar 27</td>
<td>RNA interference applications to cancer</td>
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<td>Apr 1</td>
<td>Chromosomal evolution – Dr. Robert Dowler</td>
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<td>Apr 3</td>
<td>Student paper presentation – TBD</td>
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<td>Apr 8</td>
<td>CRISPR and gene editing</td>
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<td>Apr 10</td>
<td>Sex determination genes in mammals</td>
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<td>Apr 15</td>
<td>Comparative genomics</td>
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<td>Apr 17</td>
<td>Student paper presentation – TBD</td>
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<td>Apr 22</td>
<td>Metagenomics</td>
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<td>Apr 24</td>
<td>Medical genetics</td>
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<td>Apr 29</td>
<td>Genetics of early embryonic development</td>
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<td>May 1</td>
<td>Stress and genetics</td>
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<td>May 8 (W):</td>
<td>FINAL EXAM (10:30 am-12:30 pm)</td>
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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 at least one outside reference 1 2 3 4 5

Use of visuals

The speaker:
• presented at least 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.

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Your name: ____________________________________________ Date: ______________