Genetics
Biology 3332
Spring 2022

Instructor Information:  Dr. Katrin Kellner, Assistant Professor
Department of Biology
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Office: HPR 104
Office hours: MWF, 9:00 – 10:00, or by appointment
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This course is in a face to face format, and will be held at the designated time and place, unless otherwise communicated through Canvas. All lecture chapters, assignments and quizzes can be found on Canvas. All deadlines are listed as Central Time.

COURSE DESCRIPTION: This course provides an overview of the principles and concepts of heredity and molecular genetics. Three areas of genetics will be covered: Mendelian (or transmission) genetics, molecular genetics, and population/evolutionary genetics. While easily divided into these units, they are by no means independent, each being tied to the others. Major concepts to be covered will include how the genetic material: 1) replicates and is passed on, 2) contains information that results in a phenotype, and 3) can change. Recent discoveries, historical concepts and some applications will be discussed.

COURSE GOALS: 1) Students will understand the concepts of classical, molecular, and population genetics. 2) Students will solve genetics problems. 3) Students will make connections between genetics, their lives and other disciplines.

LEARNING OUTCOMES: Upon completion of BIOL 3332, the student should be able to
1. list, state, and define the terms of genetic transmission, expression, and change
2. summarize, describe, analyze, categorize, synthesize, and evaluate the principles and processes of genetic transmission, expression, and change
3. assess the merits of genetic hypotheses
4. recall, draw, diagram, interpret, the processes of genetic transmission, expression, and change
5. solve problems, formulate hypotheses, calculate results, based on data generated from genetics

RECOMMENDED BOOKS/Materials: There are many good genetics text books out there, and it will pay off if you have access to a book for in depth readings. For this course, it is not required that you buy a specific book. Lecture slides are based on these two books:
• Concepts of Genetics 12e by Klug, Cummings, Spencer, Palladino, Killian, Pearson, 2018
• Principles of Genetics by D. P. Snustad and M. J. Simmons, 6th, John Wiley & Sons, Inc, 2011
Other materials (lecture recordings, lecture slides, videos, animations, online tutorials) can be found through Canvas.

**COMMUNICATION**

**Announcements:** Announcements are found on Canvas, and depending on your Canvas settings for this class, you will get notified if there is a new one. Please make a point of reading the announcements. This is how I will communicate with the class as a whole when there is important information you need. One way in which I use announcements is if I get the same question from several students, then I may use an announcement to clarify the point in question for everyone.

**Office hours:** I am available MWF, 9 am – 10 am. If the above hours do not work for you, please contact me anyways and we will set up a time that works for both of us. If you would rather meet with me in person on campus, please contact me and we can arrange that.

**Important Note:** This syllabus, along with course assignments and due dates, are subject to change. It is your responsibility to check Canvas for corrections or updates to the syllabus. Any changes will be clearly noted in a course announcement.

**GRADING POLICY:** The final grade will be determined as follows:

**Participation**
Attendance and participation is essential to success in this course. Students are expected to come to class and participate. To record your participation, there will be random pop quizzes throughout the semester and in-class exercises. You will not be graded on the correctness of your answers, but if you do not come to class and miss such a pop quiz, you will automatically receive a zero on that day. There are no make-up pop quizzes.

**Practice Quizzes**
For each chapter, there will be a Quiz (each Quiz is 10 pts). Quiz questions will cover material from this chapter’s lecture. Quizzes can be found online on Canvas. The point of these quizzes is to work through practice questions. You have one week time to turn in your quiz.

**Exams**
Three exams (each 100 pts) and one cumulative final exam (150 pts). Exam questions will be multiple choice, true and false, and short answer style. Exams cover material from the previous chapters (final exam covers all chapters). Exams are spaced throughout the semester (see schedule below).

**Review sessions** Before the exams, I will post some summaries and helpful information in a review format. Please, if you have specific questions about certain topics or want me to explain something again, let me know at least one week before the exam is scheduled, so that I can include this in the review.

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<tr>
<th>Points Possible</th>
<th>%</th>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>100</td>
<td>13</td>
<td>90-100%</td>
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Exam 2  100  13     80-89%    B
Exam 3  100  13     70-79%    C
Final   150  21     60-69%    D
Quizzes 130  20     50-59%    F
Participation 130  20
**Total** 710  100%

**Make-up exam Policy**
If you are unable to take an exam as scheduled, a make-up will be arranged ONLY if the reason is legitimate (illness, sport and religious events, emergencies), and you can provide written documentation (doctor’s note, etc.). A make-up exam will have to be scheduled no later than a week after the missed exam. Students who fail to make appropriate arrangements will receive a grade of “0” for the exam missed. For missed assignments and exams due to Covid-19, please follow the universities covid guidelines.

**LECTURE SCHEDULE***:

**Course Content Overview**

Welcome! Class Orientation-Syllabus and Canvas
Introduction: The Science and History of Genetics
Chapter 1: Cellular Reproduction: Mitosis & Meiosis
Chapter 2: Mendelian Genetics: The Basic Principles of Inheritance
Chapter 3: Extensions of Mendelian Genetics
09/17/21 Exam I Covers Chapters 1-3

Chapter 4: Sex determination and sex chromosomes
Chapter 5: Chromosome Mapping, Linkage, Crossing Over: The Chromosomal Basis of Mendelism
Chapter 6: Chromosomal Mutations: Variation in Number & Arrangement
10/08/21 Exam II Covers Chapters 4-6

Chapter 7: The Genetics of Bacteria and their Viruses
Chapter 8: DNA Structure and Analysis, chromosomes
Chapter 9: DNA Replication and recombination
Chapter 10: The Genetic Code and Transcription
Chapter 11: Translation and Proteins
11/12/21 Exam III Covers Chapters 7-11
Chapter 12: Gene Mutation and DNA repair
Chapter 13: Population & Evolutionary Genetics

Final week : TBD Final Exam (Covers chapters 12 and 13, and parts of 1-11)
* Please note that this is a tentative schedule. If there are changes, I will communicate through an announcement. The dates for the exams are also tentative, and can be flexible.

For Student Resources and University Policies, please follow the tabs in the Syllabus module in Canvas.