

GEN 604: Principles of Genetics Syllabus

MWF 10:10-11am

How to contact course staff

The best way to contact me (Sydney Birch) is by email (sjb1061@wildcats.unh.edu). If you are coming to office hours please schedule ahead of time. If you can not reserve a time during office hours you can try to get in contact with the other 3 TAs or email me and we can schedule a different day and time. Don't forget the TAs also have weekly office hours throughout the week!

Course Materials

- **Book:** Introduction to Genetic Analysis (11th Edition), by Griffiths, Wessler, Carroll & Doebley.
- **iClicker**

Teaching Philosophy

I just want to start by saying I am very excited to teach you all genetics this semester! I would like to create an inclusive learning environment where everyone feels comfortable with the material and with participating. I am also excited to announce that this course is an integrative student-centered course meaning that all learning activities are geared towards you all understanding the learning objectives and receiving feedback in regards to your progress. This will be a challenging course with a lot of assignments and material but it will help with understanding the material; one of my goals for this course is to prepare you for the upper level courses. I do expect a lot from you all, you should also expect a lot from me. If you are struggling please come in and see me or the TAs and don't forget to ask plenty of questions!

Integrated Course Design

As mentioned in the teaching philosophy, this is an integrated course. This means that I have taken into consideration the situational factors of the course and have created learning goals, feedback and assessment procedures, and selected teaching/learning activities based on the situational factors. Situational factors are the student aspects of the course, for instance, how many students are taking the course, what year/level are they, what kind of prior knowledge do the students bring to the course about the subject, etc. So basically I have designed the course based on all of you. Every activity (lecture, quiz, homework set, exam) is integrated in the learning goals and vice versa; and the learning goals and teaching activities

are both integrated in the feedback and assessments and vice versa. By doing this, hopefully you all will take away the main concepts of this course to apply to future, upper level courses and real-world scenarios.

Course Overview

As a brief overview of this course, we will be learning the fundamentals of genetics. These are the foundational concepts that you will need in your upper level courses and beyond. There are 7 major topics of the course that will be discussed in depth, and are listed below. We will spend 2 weeks on each topic. The exams will have 3 topics on each and the final will be cumulative with the remaining information.

- Major Topics:
 - Chromosomes, Cell Division, Meiosis
 - DNA and Chromosome Structure
 - Mendelian Genetics and sex determination and linkage
 - Linkage and Mapping
 - Replication, Transcription, and Translation of Proteins
 - Gene Regulation
 - Genomics, Epigenetics, and quantitative Genetics

Learning Objectives

Foundational Knowledge (Learning objectives):

- Key information:
 - Identify the causes of modification in standard Mendelian ratios
 - Describe chromosome mutations and structure
 - Describe DNA structure and replication
 - Describe the process of transcription and translation
 - Understand the mechanisms of gene regulation
 - Describe the types of mutations and their effects on proteins
 - Understand genomic and bioinformatics concepts
 - Understand the factors that affect allele frequencies
- Key Ideas:
 - Predict genotypic and phenotypic outcomes of different crosses
 - Use statistical analysis to interpret results of genetic crosses
 - Explain the differences of prokaryotes and eukaryotes
 - Diagram DNA structure and replication
 - Predict consequences of mutations on the products of transcription and translation and how genomes are sequenced

Course goals

This course will help foster critical thinking and practical thinking skills and will help connect genetic concepts with other courses while providing foundational knowledge for upper level courses. The TAs and I will provide feedback on all homework sets in a timely fashion to aid in your learning of the material. There will also be an explanation of the grading criteria and standards for assignments so you know what we are looking for and to better help you understand the concepts. Overall, I want to prepare you for upper level courses and teach you the key concepts needed to address current problems in the field, all in an integrative fashion.

Weekly Schedule

<u>Monday</u>	<u>Tuesday</u>	<u>Wednesday</u>	<u>Thursday</u>	<u>Friday</u>
Lectures with clicker questions		Lectures with clicker questions		Lectures with clicker questions
Reading and a Quiz Due 10am		Homework problem set due at 10am		Reading and a Quiz due 10am
		Recitation with a quiz	Recitation with a quiz	Homework set Posted

Grading

The Grade Scale:

A	93-100
A-	90-92.99
B+	87-89.99
B	83-86.99
B-	80-82.99
C+	77-79.99
C	73-76.99
C-	70-72.99
D+	67-69.99
D	63-66.99
D-	60-62.99
F	Below 60

Exams (2) – 40% (2 each at 20%)
Final – 25%
Homework – 15% (drop 2 lowest)
Clicker questions – 5%
Quizzes – 5%
Participation (1 min. paper) -10%

Example of how to calculate grade:

Exam1 = 80/100

Exam 2 = 90/100

Final = 80/100

Homework = 100/130

Clicker = 30/45

Quizzes = 20/30

Participation = 15/15

$(80*0.2)+(90*0.2)+(80*0.25)+(100*0.15)+(30*0.05)+(20*0.05)+(15*0.1)/100 = 73$ Final grade = 73

Exams and Assignments

Exams will contain a mixture of fill in the blank, multiple choice, and short answer. The questions will be based off of the learning objectives and the homework sets. The final exam will be cumulative.

I-clicker questions will be given during lecture based on the lecture material. The goal is to induce active learning.

Homework sets will be given each week ranging in difficulty of the material from the lecture. They will also be based on the learning goals and will be turned in prior to class on Wednesday. Homework sets will be graded for accuracy and are tools to help you study for the exams.

Recitation participation will be graded based on participation in discussion of the homeworks and the completion of a 1-minute reflection paper describing what the most challenging concept was that past week. At the beginning of recitation there will be a short quiz (~5 questions), you will then come up with one new question with the answer to be asked for next week.

Quizzes based on the reading will be due online prior to class on Mondays and Fridays based on the reading assignments in the book.

Student Accessibility Services

The University of New Hampshire is committed to providing students with documented disabilities equal access to all university programs and facilities. If you have a disability requiring accommodation, you must register with Student Accessibility Services (SAS). Contact SAS at 862-2607 or go to <http://www.unh.edu/studentaccessibility>. If you have received an Accommodation Letter for this course from SAS, please meet with me to review those accommodations.

Professional Standards/Academic Honesty

The University of New Hampshire Student Rights, Rules and Responsibility defines plagiarism as the unattributed use of the ideas, evidence, or words of another person, or the conveying of the false impression that the arguments and writing in a paper are the student's own. Plagiarism includes, but is not limited to the following:

19. The term “plagiarism” includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgement. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials. (p. 4)

09.3 Plagiarism

The unattributed use of the ideas, evidence, or words of another person, or the conveying of the false impression that the arguments and writing in a paper are the student's own. Plagiarism includes, but is not limited to the following: 1. The acquisition by purchase or otherwise of a part or the whole of a piece of work which is represented as the student's own;

2. The representation of the ideas, data, or writing of another person as the student's own work, even though some wording, methods of citation, or arrangement of evidence, ideas, or arguments have been altered; 3. Concealment of the true sources of information, ideas, or argument in any piece of work. (pp. 22-23)

The University policy on academic honesty describes standards for conduct, examples of cheating and penalties, which can include failure of the course, suspension, or dismissal from the University. To avoid plagiarism, be sure to acknowledge the source, using the conventions of an appropriate academic documentation style (such as MLA and APA).

Syllabus Annotation

I start the syllabus with my contact information and what materials are needed for the course. I think this is important information to include first to help students easily get in contact with me and so they know what they need for the course. I then go into an explanation of my teaching philosophy and the integrated course design I have chosen for this course. This is important so they understand why I have chosen particular learning activities; it is all to benefit their learning and is not random on my part (Eberly Center). This will hopefully allow them to see that I really do care about their learning and this course is focused on them. I then proceed to discuss the course overview and learning objectives. The overview prepares them for what is to come and the learning goals is a list of items that they should focus on for studying (relating current information to those goals) and is what I want them to walk away from this course knowing. The goals also help explain my learning activities because the activities were designed with the goals in mind as I mentioned previously (Eberly Center, 2016). Next is the weekly schedule and grading, again to help students prepare for what is to come and what is expected of them. The next section, the description of assignments, is very important. I explain why I have chosen select assessment activities (Eberly Center, 2016). I think incorporating variation in exam type questions will help students learn and will be an effective way of assessing their knowledge. The i-clicker questions during presentations will help break up the lecture and will help to engage the students in learning (inducing active learning). The homework sets will also help engage the students and will aid in retrieval practice. Recitation will be a key-learning environment in that there will be small quizzes of various learned material, which will help with retrieval and is a form of interleaving the material. I am also asking them to generate their own questions and provide an explanation of what they think is difficult. This is a way of incorporating self-explanation, which actively engages them in learning and will help them identify what they need to study more (Cornell, 2012; Lynch, 2016). The last assessment is reading with quizzes that are due weekly. This reading will have embedded questions (within the textbook) to again increase the active learning occurring outside of the classroom (Cornell, 2012). These readings also prime students for what they will be learning in lecture on Mondays and Fridays.