BIS101

Schedule

BIS101

TR 6:10 - 8:00 PM Giedt 1001

BIS101D

- Section 20 (Jimenez)
    - 5:10-6pm R
    - Wellman 233
- Section 21 (Jimenez)
    - 4:10-5pm R
    - Wellman 233
- Section 22 (Stitzer)
    - 9-9:50am F
    - Wellman 233
- Section 23 (Stitzer)
    - 10-10:50am F
    - Wellman 233
- Section 24 (Stitzer)
    - 11-11:50am F
    - Wellman 7
- Section 25 (Jimenez)
    - 12:10-1pm F
    - Wellman 233

Instructors

Dr. Jeffrey Ross-Ibarra


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Office hours: Monday 10-11am, Thursday 9am-10am
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Teaching assistants:

Michelle Stitzer

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Robyn Jimenez

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250 Briggs Hall
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Course objectives

This course will enable students to describe the fundamental concepts in transmission, molecular and quantitative genetics. This includes understanding the following:

- The meaning of fundamental genetic terms such as allele/locus/genotype/genome
- phenotype/trait and heritability
- How alleles and genes segregate
- How alleles and genes influence phenotype/trait display in organisms
- Exceptions to Mendelian genetics
- How molecular biology can be used to manipulate genes and genomics
- How Mendelian genetics and quantitative genetics are connected
- The information available from modern genomics technology

Students will be able to apply these concepts to solve genetic problems such as the following:

- Given an organism with a defined trait and phenotypes, students will be able to determine genotype by examining the phenotype of progeny from any cross.
- Predict the nature of the alleles and genes segregating in these crosses
- State if these alleles and genes are segregating as Mendel predicted or explain why they deviate from these rules.
- Calculate probability that a given phenotype will arise in a genetic cross.
- Use pedigree information to predict the likelihood that a given individual will have a particular genetic disease.
- Use genetic/phenotypic information to map genes relative to genetic, physical and phenotypic markers.

- Using information about trait heritability make an informed statement about the progeny of any given cross.

Text

Required: Griffiths A, Wessler SR, Carroll SB, and Doebley J. Introduction to Genetic Analysis. New York: W.H. Freeman, 2012. 10th Edition.

The 9th edition of this book is similar, but is missing important new chapters in population and quantitative genetics, and suggested homework problems are from the 10th edition. Using the 9th edition is discouraged. The 10th edition is on reserve at the library.

Lectures

Lectures will predominantly be on the chalkboard. Copies of Dr. Ross-Ibarra's lecture notes can be found on SmartSite in the resources section. While you are welcome to use these notes, they are subject to change and correction and will not be posted on any regular schedule. They are not intended as a student aid.

Lectures will consist of ~70 minutes of lecture, followed by a 5 minute break. Each class, after the break, we will discuss part of a research paper from the primary scientific literature.

You are welcome to make recordings of the lecture.

Papers

We will read a scientific paper on genetics every week. You are expected to read the paper, and the content of the papers will be on exams and quizzes. Reading scientific papers takes practice; don't treat this like reading a text. Some good advice on reading scientific papers can be found online thanks to educators at Rice, Arizona, and even a flash video from Purdue.

Grading

Grading in the course will consist of two exams and in-class quizzes as follows:

- Exam 1: 100 pts (40%)
- Eaxm 2: 100 pts (40%)
- Quizzes: 50 pts (20%)

Grades will be based on the percentage of the current highest score:

Grade	% of Top Score
A+	97-100%
A	91-97%
A-	88-91%
B+	85-88%
B	79-85%
B-	76-79%
C+	73-76%
C	67-73%
C-	64-67%
D+	61-64%
D	55-61%
D-	52-55%

Exams

Exams will be taken during the normal class (or final exam) period. You will be allowed a single page of hand-written notes to use for your exam. Notes that exceed this length or are not hand-written will be confiscated. The second exam will be occur during the final exam period, but will not be cumulative. Exams will consist of material primarily (~3/4) from the lecture and secondarily (~1/4) from discussion of the research papers.

If you feel that your exam grade is in error, you may ask for a regrade. At the TA's discretion your entire exam may be regraded, and experience shows students often lose points upon regrade; it is thus not advised to ask for a regrade unless you believe an actual error was made during grading. Due to constraints of turning in grades at the end of the quarter, there are no regrades on the second exam.

Quizzes

Five short quiz questions will be presented during each lecture. You will have 1-2 minutes to answer each question, during which time you may discuss your answer with your peers. At the end of each lecture you will turn in your 5 answers. Each week the TAs will choose one of the quizzes to grade, the other will not be graded. Each question is worth one point, and because 10 of the 18 quizzes will be graded there will be a total of 50 possible quiz points. Answers to the quiz will be discussed at the beginning of the following lecture.

If you have a documented excuse, you may contact Professor Ross-Ibarra or one of the TA's

with evidence of your reasons for missing class and schedule a make-up quiz during office hours.

Homework

Suggested homework problems are listed on the syllabus. Homework is not required and will not be graded, but is recommended as it will help you prepare for quizzes and exams.

Academic honesty

Any form of academic dishonesty will not be tolerated. For a full understanding of the UC Code of Academic Conduct please go to the Student Judicial Affairs website.

Email Policy

Formal and professional conduct is expected of you at all times. Email, as a form of professional communication (unlike text messaging), is no exception. Email must come from your UCD email ending in ucdavis.edu. Emails must have a subject line that includes the subject of the message and the name of the class (BIS 101), and must be formally addressed. Emails that do not follow these guidelines run the risk of being ignored or deleted. We will make every effort to answer emails in a timely fashion.

Tutoring

The Student Academic Success Center is sponsoring drop-in tutoring Monday-Thursday 1-4pm, starting Oct. 13, in 1079 SLB.

BIS 101D:

If you have enrolled in BIS 101D, you must attend the session in which you registered. Please make sure that you registered for sections accompanying BIS 101-002. These are sections BIS 101D-020 to 025. If you have registered for any other section, please reregister for one of these sections. Grading for these sections will be P/NP and determined by the instructor of your section.

Lectures

Thursday Oct 2

- **Mendelian Inheritance**
- Reading: Griffiths Ch. 2
- Homework: Ch. 2: 23,38,48,49,54

Tuesday Oct. 7

- **Independent Assortment**
- Reading: Griffiths Ch. 3
- Reading: Ng et al. 2010
- Homework: Ch. 3: 13,20,28,32,46

Thursday Oct. 9

- **Gene Interaction**
- Reading: Griffiths Ch. 6
- Reading: Ng et al. 2010
- Homework: Ch. 6: 36, 62

Tuesday Oct. 14

- **Genetic Mapping**
- Reading: Griffiths Ch. 4
- Reading: Schemske and Bradshaw 1999
- Homework: Ch. 4: 25, 45, 63

Thursday Oct. 16

- **Quantitative Genetics**
- Reading: Griffiths Ch. 3 section 3.4, Ch. 19
- Reading: Schemske and Bradshaw 1999
- Homework: Ch. 19: 8,12,13*

Tuesday Oct. 2

- **Population Genetics**
- Reading: Griffiths Ch. 18
- Reading: Johnston et al. 2013
- Homework: Ch. 18: 10,18

Thursday Oct. 23

- **Phylogenetics and Macroevolution**
- Reading: Griffiths Ch. 14.5, 20
- Reading: Johnston et al. 2013
- Homework Questions: Ch. 14: 26; Ch. 20: 21,22

Tuesday Oct. 28

- **Genomics**
- Reading: Griffiths Ch. 14
- Homework Questions: Ch. 14: 24,25,27,35

Thursday Oct. 30

- **DNA and RNA**
- Reading: Griffiths Ch. 7, 8
- Reading:
- Homework: Ch. 7: 23, 27, 30

Tuesday Nov. 4 -- MIDTERM

Thursday Nov. 6

- **Regulation of Gene Expression**
- Reading: Griffiths Ch. 11
- Reading: Kudla et al. 2009

Tuesday Nov. 11 -- HOLIDAY

Thursday Nov. 13

- **Regulation of Gene Expression**
- Reading: Griffiths Ch. 12
- Reading:
- Homework: Ch. 9: 12, 43
    - Ch. 11: 9
    - Ch. 12: 15, 30

Tuesday Nov. 18

- **Proteins**
- Reading: Griffiths Ch. 9
- Homework: Ch. 10: 13, 18, 29;
- Reading: Kudla et al. 2009

Thursday Nov. 20

- **Development**
- Reading: Griffiths Ch. 13

Tuesday Nov. 25

- **Gene Isolation and Manipulation**
- Reading: Griffiths Ch. 13
- Reading:
- Homework: Ch. 13: 9, 14

Thursday Nov. 27 -- HOLIDAY

- **No Class, University Holiday**

Tuesday Dec. 2

- **Mutation and Recombination**
- Reading: Griffiths Ch. 16
- Reading:
- Homework:
    - Ch. 8: 20,21,27
    - Ch. 16: 8, 21

Thursday Dec. 4

- **Transposable Elements**
- Reading: Griffiths Ch. 10, 15
- Reading: Makarevitch et al. 2014
- Homework: Ch. 10: 31, 32; Ch. 15: 11, 18

Tuesday Dec. 9

- **Chromosomal Evolution**
- Reading: Griffiths Ch. 17
- Reading: Ibarra-Laclette et al. 2013
- Homework: Ch. 17: 39, 44

Thursday Dec. 11

TBD