

Biology 352: GENETICS AND EVOLUTION

Spring 2017 (Lecture: Mon/Wed 10:00 – 10:50am, Activity Section: various times in LSN 235)
Syllabus (subject to change)

Instructor contact information:

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Dr. Marshal Hedin, Professor

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Office hours: Tuesday 11:00AM-1:00PM or by appt., LS North 204E

Organization

Biology 352 is divided into two sections: transmission and population genetics, and evolutionary biology. A faculty member with the appropriate expertise will teach each section. Dr. Renner will teach the first half of the course and Dr. Hedin will teach the second half. Weekly activity sections with a graduate teaching assistant will be used to reinforce the learning objectives using computer activities, worked problem sets, and discussions of scientific papers. Food and drinks are NOT allowed in the rooms where activity sections are held.

Textbooks

Required resources available in the Bookstore or via other suppliers (such as Amazon):

- 1) Bergstrom, C.T. and L.A. Dugatkin. 2016. *Evolution*. 2nd edition. Norton.
- 2) Reader for the weekly activity section (available in the Bookstore).

Required resources provided by instructors (available on BlackBoard):

- 1) Tamarin, R.H. 2001. *Principles of Genetics*. 7th edition. McGraw-Hill.
- 2) Pierce, B.A. 2012. Supplementary background reading for first lecture.
- 3) Carroll, S. B. 2009. *Into The Jungle: Great Adventures in the Search for Evolution*. Pearson.
Additional resources available at: <http://tinyurl.com/carroll2>

A copy of Bergstrom & Dugatkin will be on reserve in the library. Search under “Biology 352” (<http://libpac.sdsu.edu/screens/rbr.html>), and check under the names of any/all instructors that appear.

Some students in past semesters have requested additional help and practice problems for the “Population Genetics” portion of the course. For those who want additional help, we recommend this optional supplemental book:

Ayala, F.J. 1982. *Population and evolutionary genetics: a primer*. Benjamin/Cummings, Menlo Park, CA.

Ayala is now out of print, and because it was published in 1982, it contains almost no information on DNA. Nevertheless, this book most closely parallels the material presented in the first portion of the course. A copy of this book is on reserve in the library. You may also be able to find a used copy through Amazon.com or a similar source for less than \$10.

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Prerequisites. Biology 203, 204 and 215 are necessary and required. Another statistics course may be substituted for Bio 215 as a prerequisite: consult with the Bioadvising office (LS 135). We welcome all students who have fulfilled the three prerequisites to Biology 352. If you are a Biology major (and not enrolled as a “Premajor”), then you should have these prerequisites.

Dropping Biology 352. After the first two weeks of the semester (exact date is on the SDSU academic calendar) it is very difficult to drop any course at SDSU. All requests after that date are reviewed by the University’s registrar office or an assistant Dean, not by the instructors of the course. Unless you have a serious, compelling and well-documented medical or personal problem (e.g., death in the immediate family), your request will probably be denied. In the event that you need to petition for a late drop, see your major advisor immediately.

Cell phones. The use of cell phones in any way (including text messaging) is distracting to other students and the instructor. **TURN OFF CELL PHONES** prior to lecture. The use of all electronic devices except calculators is strictly prohibited during quizzes and exams. This includes cell phones and PDAs. Put a calculator in your backpack and leave it there, so you will have it for quizzes and exams.

Be courteous. Every student is expected to contribute to a positive, distraction-free learning environment. No talking while the instructor or another student is talking to the class. In general, please be respectful of other students and the educational process.

Class Blackboard site. All class material will be posted on Blackboard (<https://blackboard.sdsu.edu>). This will include outlines, practice tests, exam scores and keys to exams. The lecture outlines will be available prior to each lecture for you to print and bring with you. The Blackboard site will be updated often.

You will have access to two Blackboard sites for this course. One will include all of the lecture materials, and the activity section handouts. The second will be maintained by your TA to post the activity section scores/materials, and any messages specifically from your TA. If you do not have access to both Blackboard sites, please inform your TA.

The lecture material provided on Blackboard will be outlines and some figures, rather than a complete set of notes. We emphasize that these outlines do not take the place of lecture notes and they **DEFINITELY** do not take the place of coming to class. You are expected to attend class and take your own lecture notes. *We expect you to bring lecture outlines to class, either as digital files or printed out.* The pace of the lecture assumes that you have these materials with you in class so that you need not write down information already available from Blackboard.

Evaluation

Exams in lecture:

1. The course is divided into four sections. Each section will be concluded with an exam (25 questions, 50 points) over that section’s material. The final (80 points) will include 25 questions from the final part of the course and 15 questions that integrate material from across the entire semester. Exams will primarily be multiple-choice questions.

For all exams, bring a red ParSCORE form F-289-PAR-L.

You will not be able to take exams without a ParSCORE form and a pencil!

*** * The final is already scheduled for Friday, May 5th 10:30AM-12:30PM. * ***
*** * Do not schedule personal travel during the final. * ***

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Evaluation

Activity section:

1. There will be a quiz (2-3 questions, 3 points total) at the beginning of each week's activity section, beginning in week 2. Quizzes will be primarily short answer. The questions will be specific to the handout for that particular activity. Pay close attention to the instructions at the beginning of each handout regarding your preparation. Make-up quizzes and exams will not be given for traffic delays, so plan accordingly.
2. In some weeks (see schedule), an additional 5 points will be assigned to homework.
 - a. Homework will be collected one activity section after it is assigned, at the beginning of the activity section. If you are absent from the activity section, the homework is still due at the same time. Send an electronic copy to your TA, or have a friend turn in a printed copy. If you are unable to complete your homework on time due to an excusable absence, you must contact the TA before the due date to request an extension.
 - b. Some homework assignments must be uploaded into Blackboard using TurnItIn and a hard copy must be turned into your TA. The assignment is not considered "turned in" until it is uploaded. If you neglect to also provide a hard copy before the due date, a 1 point penalty will be assigned.
3. In some weeks (see schedule), you will need to read a paper prior to discussion participation (specific weeks; see schedule). For discussions, each student will present and lead the discussion of one question from the assignment handout (as chosen by the TA). Students are also expected to answer questions that others bring up, and come up with novel questions and insights. For full discussion credit (2 points), you must do the following:
 - a. For one question, lead a short discussion. Go beyond simply telling the class the question and response. Solicit participation and demonstrate the logic behind the answer.
 - b. Participate in discussions generated by at least three other students during the class period.
4. Microsoft Excel will be used in some activity sections. You will need to have access to a computer with Excel in order to complete the homework. Notify your TA as soon as possible if this is a problem.

Activity section writing assignments:

In some weeks, your homework for the activity section will be a writing assignment. Spelling and grammar will be considered when assigning points, although not as much as content. For full credit, you will need to do more than simply rephrase the Abstract of the paper that was the focus of the assignment.

1. Your written assignments will be submitted electronically through TurnItIn on your activity section Blackboard site. On your Blackboard site, click on the "Assignments" link on the left. Within that folder will be a link for each assignment.
2. You must also bring a hard copy to the activity section when the assignment is due.

For full credit, the hard copy and the upload to TurnItIn must both be completed by the due date and time. If you turn in your assignment in only one of these two ways before the due date and time, a 1 point penalty will be assigned. It will not be graded until it is turned in both ways.

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Scoring penalties

Activity section:

1. No penalty will be assigned if you are late for the quiz, but you will not be given extra time.
2. Some homework assignments must be uploaded into Blackboard using TurnItIn and a hard copy must be turned into your TA. The assignment is not considered "turned in" until both the electronic and the hard copy are submitted. If you turn in your assignment in only one of these two ways before the due date and time, a 1 point penalty will be assigned. It will not be graded until it is turned in both ways.
3. Late homework (not turned in at the start of your weekly activity section) will be assigned a penalty of 2.5 points (out of 5 possible points).
4. Homework will not be accepted more than two weeks late. A score of 0 will be assigned.

Plagiarism or cheating will result in a score of 0 for that assignment. The incident will be reported to the Center for Student Rights and Responsibilities for review. Plagiarism is defined in detail in your activity reader, and an example of good citation formatting is provided in the reader.

Academic dishonesty

Plagiarism: You must appropriately cite ideas that are not your own. Plagiarism is defined in detail in your activity reader, and an example of good citation formatting is provided.

Copying homework: if you turn in a homework assignment that is not your own work, the incident will be reported to the Center for Student Rights and Responsibilities for review. This includes copying homework answers from any other source (e.g., Course Hero). This includes any situation in which identical text is turned in by two students on a homework assignment, whether they are both in the course now, or one has taken the course previously.

According to university policy, plagiarism and copying will be reported to the Center for Student Rights and Responsibilities for review.

Cheating: We have a zero-tolerance policy for cheating of any sort. If you are caught cheating on an exam or quiz you will receive a grade of zero on that exercise. This includes looking at your neighbor's exam.

According to university policy, cheating will be reported to the Center for Student Rights and Responsibilities for review.

Grading scale

Exam 1:	50 pts	11 weekly quizzes (3 pts each):	33 pts
Exam 2:	50 pts	10 homeworks (5 pts each):	50 pts
Exam 3:	50 pts	2 discussions (3 pts each):	6 pts
Final:	80 pts		

TOTAL: 319 points

Note that there are 89 points for the activity section (quizzes + homework + discussions). This is approximately 30% of your total points in the course, and worth almost two exams.

The total points at the end of the course will be curved. *Without exception, students receiving less than 50% of the total points at the end of the course will be given a grade of F for the semester.* +/- grades are used in this course.

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Make up quizzes and exams

We will accommodate students who cannot take quizzes or exams, provided there is an unavoidable conflict or illness, and the student has given the instructor prior notice. Decisions for administering a make up exam or quiz will be made on an individual basis, with the following guidelines:

1. Make-ups will not be given for traffic delays, work-related conflicts or personal out-of-town travel.
2. Prior notice must be given to the instructor if at all possible.
3. If last-minute severe illness or exceptional personal problems prevent a student from taking a quiz or an exam, the instructor should be notified by email (preferable) or phone as soon as possible, and definitely before class. Documentation may be requested.
4. Make-up quizzes and exams will be different than those given in lecture. The format of a make-up will be short answer, essay, or some combination of these, rather than multiple choice.
5. Unavoidable conflicts with religious holidays, major sporting events for student-athletes, or academic activities should be kept to a minimum and documented by the appropriate university office. Documentation should be presented to the instructor during the first two weeks of class.
6. Events that require prolonged absence (more than three lectures or more than two activity sections) should be discussed with the instructor and the Biology undergraduate advising office.

Grading disputes

Grading disputes for exams, quizzes and homework must be made in writing **within 2 weeks** after the scores and keys are posted for that item.

Posting scores

All scores will be posted on Blackboard as soon as they are available.

Calculators

Calculators may be permitted on some exams and quizzes, but you must use only your own. Read the following carefully:

1. **Bring your own calculator every time.** You may not borrow a calculator from another student during an exam or quiz.
2. **Only simple non-programmable calculators are acceptable.** Calculations will involve square roots, exponents and scientific notation ... but nothing more difficult than that.
3. If you do not own an appropriate calculator, buy or borrow one before the first exam. **Programmable calculators, cell phones, etc. will not be permitted.**

Students with disabilities

If you are a student with a disability and need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that we cannot provide accommodations based upon disability until receiving an accommodation letter from Student Disability Services. Your cooperation is appreciated.

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I need to get a good grade in this class !!!

The goal of this course is to give everyone the tools necessary to master the material, and meet the course's learning objectives. However, students who struggle often have the following comments:

1. **I didn't take the activity sections seriously.** There are only a small number of points each week for the quizzes, discussions and homeworks in the activity section. But these gradually add up to 89 points. For comparison, the first three exams are worth 50 points each. So make sure you prepare for activity section each and every week to get these points!
2. **I have seen a lot of these concepts in previous courses, so I thought it would be easy.** Biology 352 goes far beyond the brief introduction you had to Punnett squares, Hardy Weinberg equilibrium, natural selection and evolution in introductory courses. The topics all *seem* familiar and make sense during lecture. So many students do not study as much as they would for a course in which everything is brand new. This is a huge mistake. Stay on top of your studying every week, because the course gradually gets more difficult.
3. **I didn't put enough time into studying for this course.** Most students are carrying a full load, with several other upper division courses. Nonetheless, *read the text before every lecture* and review your notes after every lecture. Do not fall behind! The topics in this course will continue to build on one another. Almost every lecture assumes that you remember and understand everything up to that point. If you fall behind after a few weeks, you will have a very difficult time recovering later.
4. **I don't understand math.** Genetics and Evolution is a course that focuses on the application of quantitative concepts to many kinds of problems. By its very nature, much of the course is focused on quantitative reasoning. There is no way around this. However, there is less math in this course than in a high school algebra class, although it requires some statistical concepts from Bio 215 (Statistics).
5. **I study and study but I just don't get it!** *You cannot earn a grade of B or better in Genetics and Evolution by simply memorizing facts.* This is a course that requires quantitative reasoning and problem solving. It requires you to apply principles from lecture to a brand new situation on the exam. You will be tested on your ability to integrate different concepts and decide what the results of a particular experiment would look like – or determine whether natural selection or random drift would be more important in a real life situation. This requires a deeper level of understanding than simple memorization. Study in small groups. For students who have difficulty integrating these concepts, group study seems to help. To explain a difficult concept to one of your peers, you need to *really* understand it yourself.
6. **"The tests are tricky."** We do our best to make sure that every question on the major exams has one and only one correct answer, and that the focus of the question is clear. Every exam will have a mixture of some simple definitions, some straightforward calculations or breeding experiments, and some more complicated scenarios that require you to apply concepts to brand new situations. The "more complicated scenarios" are often presented as word problems. Several suggestions:
 - a. Take advantage of practice exams. This will show you the style of questions we are likely to ask, and the level of understanding that is required. Take the practice exams "cold". Pretend it is a real exam, take it in one sitting, and do not refer to your notes. In our experience, performance on the practice exams is a very good predictor of performance on the actual exam.
 - b. If you know the right answer, do not talk yourself out of it! This is a common problem. Some students perform better if they decide what the correct answer is before looking at the answers provided. *Then* search through the list of possible answers for the correct one.
 - c. Many students benefit from group study for conceptually challenging topics. Form a study group with a small number of your peers.
 - d. Take advantage of office hours with your TA or the instructor, and immediately address any unclear concepts. The topics for each lecture build upon previous lectures, so any confusion or misconceptions will get compounded as time goes on.