

BISC 120Lg Lecture Syllabus, Summer 2024

General Biology: Organismal Biology and Evolution

Overview

This 4-unit biology course will present several key topics in evolution, ecology, environment, and the diversity of life. These topics will be covered in a series of four weekly lectures (Monday, Tuesday, Wednesday, and Thursday) and two weekly laboratory sections (Tuesday and Thursday).

Learning Objectives

At the end of the course, students will:

- know the concept of the scientific method
- understand how the scientific method is applied to key questions regarding the nature of life on Earth
- know the mechanisms of heredity
- know the theory of evolution
- understand how evolution explains the diversity of life on Earth
- know the defining characteristics of the domains Archaea, Bacteria, and Eukarya, with special attention to plants, fungi, and animals
- understand how the environment and organisms contribute to the evolution of ecological relationships
- understand how the environment has changed and continues to change and how this affects the evolution of life on Earth.
- be able to design and conduct scientific investigations
- be able to think critically about how experimental evidence answers a scientific question • be able to perform biological laboratory techniques

Faculty Instructors Professor Raffaella Ghittoni, ZHS 256, rghitton@usc.edu
Professor Trond Sigurdson, AHF 105, sigurdse@usc.edu

Instructional lab staff: Brett Spatola, PhD, ZHS 362, spatola@usc.edu
Meagan He, MS, ZHS 367, meaganhe@usc.edu

Textbooks Lecture
Campbell Biology 12th ed., 2020.

Laboratory
BISC 120 Laboratory Manual (PDF available on Brightspace)

Lecture times Monday, Tuesday, Wednesday, Thursday, 10:00 A.M. – 12:05 P.M.

Laboratory times Tuesday and Thursday, 1:00 – 3:50 P.M.

Office Hours Ghittoni: Monday and Wednesday, 12:05 to 1:00 P.M.

Sigurdson: Monday and Tuesday, 12:05 to 1:00 P.M.

Exams

The lecture portion of this course will include four exams (two from each professor). All exams may include multiple choice questions, matching questions, fill-in answers, true/false answers, short answers, short essays, definitions, and quantitative problems. Students must take all four lecture exams to complete the course and complete at least 80% of the assigned laboratory activities.

Lecture Quizzes

Five lecture quizzes (each worth 15 points) will be administered online via Brightspace. The quizzes will be posted by 2:00 pm on Fridays and will remain available until 9:00 am the following Monday. Questions will cover the preceding week's material. Answers to quiz questions will be posted at the end of each quiz period.

Grading

After each exam, grade point cut-offs will be released. There is not an absolute number of points that predetermines a letter grade of A, A-, B+, B, B-, etc. The final letter grade for the course will be assigned on a curve, determined by the total number of points as given below.

Exam 1	150
Exam 2	150
Exam 3	150
Exam 4	150
Lecture Quizzes	75
<u>Laboratory Assignments</u>	<u>325</u>
TOTAL POINTS IN COURSE	1000

Schedule of lecture topics

(subject to modification of specific topics and reading assignments*):

Day		Lecturer	Lecture	Readings
Wed	May 21	Ghittoni	Introduction; The Scientific Method	Course Syllabus, 1.3
		Ghittoni	Genetic Material and Expression	12.1, 16.1, 17.1
Thu	May 22	Ghittoni	Mendelian Inheritance 1	14
Mon	May 26		No class scheduled (Memorial Day holiday)	
Tue	May 27	Ghittoni	Mendelian Inheritance 2	14
Wed	May 28	Ghittoni	Molecular Basis of Inheritance	15
Thu	May 29	Ghittoni	The Darwinian Revolution, Mechanisms 1	22, 23, 25.6
Mon	June 2	Ghittoni	EXAM 1	
Tue	June 3	Ghittoni	Evolutionary Mechanisms 2; Speciation 1	23.3-4, 24.1-2, 25.5
Wed	June 4	Ghittoni	Speciation 2	24.3-4, 25.5
Thu	June 5	Ghittoni	The History of Life on Earth	25
Mon	June 9	Ghittoni	Phylogeny and the Tree of Life	26
Tue	June 10	Ghittoni	Viruses	19
Wed	June 11	Ghittoni	EXAM 2	
Thu	June 12	Sigurdson	Prokaryotes	27
Mon	June 16	Sigurdson	Endosymbiosis and Protists 1	28, 31.1-3
Tue	June 17	Sigurdson	Protists 2; Fungi	28, 31.1-3, 31.5
Wed	June 18	Sigurdson	Plant Evolution 1	29
Thu	June 19	Sigurdson	EXAM 3	
Mon	June 23	Sigurdson	Plant Evolution 2, Animal Development	29, 30.1-3, 32
Tue	June 24	Sigurdson	Animals: Invertebrates, Vertebrates 1	33 & 34
Wed	June 25		No class scheduled (Juneteenth holiday)	
Thu	June 26	Sigurdson	Animals: Vertebrates 2	34
Mon	June 30	Sigurdson	Ecology and Biosphere 1	52-56
Tue	July 1	Sigurdson	EXAM 4	

*Additional readings for specific lectures will be posted during the semester.

Course Policies

Policy on Re-grading Exams

If you feel that an error was made in the grading of an exam, you need to do the following:

- 1) Check the answer key with your TA
- 2) Prepare a **printed statement** explaining why you feel your grade was incorrect
- 3) Submit your printed statement and your original exam to your TA **immediately after** the examination was returned to you

The entire exam will be re-graded and, as a result, your grade may increase or decrease from a requested re-grade. No frivolous reasons will be accepted for requesting grade changes; stated reasons for a grade change must be legitimate (e.g., error in totaling the score).

Policy on Missed Lecture Exams

No make-up lecture exams will be given in this course.

If you have to miss an exam due to religious holiday (<http://orl.usc.edu/religiouslife/holydays/absences.html>) or University sanctioned event (e.g., student athletes with away-games) you must notify the professor and lab manager at least 7 days in advance.

If you miss an exam due to medical illness and/or an emergency situation, you must contact the professor and the laboratory manager (spatola@usc.edu) **within 48 hours** of the missed exam. In these cases, a prorated score (i.e. the adjusted averages from the exams that you did complete) will eventually replace the missed exam in the gradebook. Please note that students must complete at least 3 lecture exams to receive a letter grade in the course.

If you miss the final exam with an illness or emergency, a final course grade of incomplete (IN) will be recorded and you will be permitted to take a make-up final examination during the following semester.

Extra Credit

No extra credit will be given for special projects, etc.

Students with Disabilities

Students requesting academic accommodations based on a disability are required to register with the Office of Student Accessibility Services (OSAS) each semester. Students will then schedule and complete exams at the OSAS testing center (SSL 301).

Be sure that the accommodations letter is emailed to the Laboratory Manager (spatola@usc.edu) as early in the semester as possible, preferably by May 27.

OSAS is located in STU 301 and is open from 8:30 a.m. to 5:00 p.m., Monday through Friday. The telephone number of OSAS is 213-740-0776. For more information please visit the following website: http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html

Statement on Academic Integrity

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles.

Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00: <http://web-app.usc.edu/scampus/1100-behavior-violating-university-standardsandappropriate-sanctions/>, while the recommended sanctions are located in Appendix A. Students will be referred to the Office of Student Judicial Affairs and Community Standards (SJACS) for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>.

Website

Students are responsible for logging onto Brightspace and checking the course website on a regular basis. Postings will be an official source for announcements, course materials, lecture notes, lab notes, score postings and general discussions. Weekly quizzes will also be completed on Brightspace.

Gift Policy

No gifts or presents of any kind are permissible to give to any of the instructional staff.

Final Comments

No exceptions will be made to these policies under most circumstances. If you think that the instructor or TA has granted you **any deviation** from the policies in this document and associated course syllabus, you must obtain their **written agreement** to support that claim.

BISC 120 Laboratory Syllabus

Instructional lab staff:

- a) Lab manager: Brett Spatola, PhD. ZHS 362 spatola@usc.edu
- b) Senior lab technician: Meagan He, MS. ZHS 367 meaganhe@usc.edu

Laboratory Schedule:

Lab #	Date	Topic	Post-lab assignment
1	May 22	Safety and introduction	Lab syllabus + questions
2	May 27	Microscopes	Research article + questions
3	May 29	Scientific Investigation I	Bean beetle introduction
4	June 3	Scientific Investigation II	Bean beetle results
5	June 5	Evolution	Phylogenetic tree analysis
6	June 10	Bacteria I	Bacteria/antibiotics introduction
7	June 12	Bacteria II	Bacteria/antibiotics results
8	June 17	Animal Behavior	Jove + questions
9	June 19	Ecology	
	June 24	Lab exam	
	June 26	Biodiversity Presentation	

*Minor schedule adjustments may occur during the semester.

Required Textbook:

BISC 120 Laboratory Manual. PDF will be posted on Brightspace and printouts/electronic copies must be brought to lab each week. Please note that many activities during the lab involved observing and drawing objects from a microscope, so printed copies (or scratch paper) is recommended.

Lab point distribution

The laboratory portion (325 points) will count for ~32% of your final course grade, distributed as follows:

Post-lab assignments (8 x 10 points each)	80 pts
Lab exam	105 pts
PPT presentation	50 pts
Pre-lab quizzes (5 points/lab)	45 pts
Lab manual/participation (5 points/lab)	45 pts

Lab participation

You are required to attend and participate in all lab sessions. Any unexcused absences or tardiness will seriously affect your evaluation and lab participation points (5 points/lab). Come to lab on time. You are also to remain for the entire lab session or until excused by your instructor. **DO NOT** make any other appointments for the time you are scheduled to be in lab.

You are required to wear gloves, closed toed shoes, long pants and a knee-length lab coat (PPE) during lab. Lab coats can be purchased from the USC bookstore or online.

Before you begin the lab exercise, make sure that you remove all unnecessary materials from your work area. At the end of the lab session, clean and return all supplies to their proper place, clean your work area, and slide your chair under the table to receive the full participation points. Check with your instructor before leaving.

NO EATING OR DRINKING IS ALLOWED IN THE LABORATORY UNDER ANY CIRCUMSTANCES.

Please also note that there is an opportunity to earn back participation points lost for cleanup infractions.

If your bench loses points on the cleanup for a particular lab, everyone at that bench can earn those points back by having a perfect cleanup (no infractions) on the following TWO labs.

Rules:

- Only points lost for cleanup infractions can be made up this way. Points lost any other way (missed lab, lack of contribution, tardiness, etc.) cannot be earned back with this policy.
- The two perfect cleanups must occur consecutively, in the two weeks following the lab you want to earn back points on. So if you lost points on Lab 4's cleanup, you would need a perfect cleanup for Labs 5 and 6 to earn back those points. If you have a perfect cleanup for Lab 5 but incur infractions on Lab 6, the opportunity to make up Lab 4's points are lost. You can still earn points back on Lab 6, though!
- "Credit" for perfect cleanups cannot be saved or banked for the future. So if you had a perfect cleanup on Labs 3 and 4, then lose points on Lab 5, you can only earn points back on Lab 5 by having a perfect cleanup on Labs 6 and 7. You cannot apply "credit" from Lab 3 and 4's perfect cleanups.
- Points lost from Labs 9 and 10 cleanups cannot be earned back (as there are not two labs after either).

Pre-lab quizzes

Before each experimental lab, students must complete a quiz to prepare for the upcoming lab topic/procedures. These quizzes will consist of 5 multiple-choice and/or true/false questions that are related to that week's lab manual chapter. Quizzes are available on Brightspace, and late submissions or regrade attempts are NOT allowed.

Lab manual chapters

During each lab, students need to record their results (drawings, observations, calculations) in their lab manual. For example, tables need to be filled in and all post-lab questions answered. Each student is required to show the lab instructor a completed and accurate lab manual chapter before leaving the lab to earn credit. Lab manuals should be unique and can't be copied from your lab bench.

Paper copies are preferred, but electron versions of lab manual chapters are allowed if they are editable.

Post-lab assignments

You will have several post-lab assignments, based on the material you learned in the lab, or data obtained in your lab experiments. All post-laboratory instructions and assignments will be posted on Brightspace. Post-lab assignments are available on Brightspace, and late submissions or regrade attempts are NOT allowed. For example, the "lab syllabus + questions" post-lab will be assigned after the lab safety lab and must be submitted before the microscope lab starts.

Lab exam

The cumulative lab exam will test your understanding of the topics, concepts and exercises covered during the semester. It's a 60-minute exam, and may contain a mix of written and/or practical questions. The lab exam will be scheduled during your normal lab section time.

Missed Lab Exam: *It is your responsibility to be present on the days of the lab exam.*

If you miss the lab exam due to a serious illness or an emergency situation, you must contact your lab instructor and lab manager Brett (spatola@usc.edu) within 48 hours of the missed exam.

If applicable and possible, then you will be allowed to take the exam in another lab section that week.

Biodiversity presentation

Students will work in pairs to present a unique biodiversity topic of their choosing (i.e. endangered species or threatened ecosystem). Prepare a ~10-minute presentation (~5 minutes/person) in front of the class with clear and engaging PPT slides. More details can be found in the presentation section on Brightspace.

Missed labs

If you miss a scheduled lab due to illness or emergency, please contact lab manager Brett (spatola@usc.edu) and your lab instructor before or ASAP after (with 24 hours) the lab to see if make up labs or alternative lab assignments are available.

Students who wish to miss a lab for observance of a religious holy day should be aware of the University's policy on such absences, published at: <http://orl.usc.edu/religiouslife/holydays/absences.html>. Requests for such absences should be made by email addressed to lab manager Brett (spatola@usc.edu) at least 2 weeks in advance of the absence. If the absence is approved, the instructors will determine a reasonable accommodation for the student.

Student-athletes who must miss occasional labs for legitimate reasons should bring the SAAS excuse letter to the lab manager at least 2 weeks in advance so alternatives can be arranged.

Please note that no lab make-ups will be allowed during the week prior to a holiday, and for school-unrelated activities.

Lab scores

You can find scores for all of your lab assignments on Brightspace. Your lab scores will be posted under your LAB SECTION. Be sure to check for additional postings or announcements on a regular basis. It is the student's responsibility to immediately notify their lab instructor in the event of any mistakes, so please check your scores weekly.