

Prof. Albert Herrera
BISC 220 (General Biology: Cell Biology and Physiology), Fall 2023
Schedule for TuTh 9:30 - 10:50 am Lectures (Section 13022)
Tentative Lecture Schedule – Subject to Revision

Lecture	Date	Day	Topic	Campbell Biology, 12 th Ed
1	Aug 22	Tu	Course Introduction; Cells 1	Ch 6
2	Aug 24	Th	Cells 2	Ch 6
3	Aug 29	Tu	Cell Membranes	Ch 7
4	Aug 31	Th	Cell Communication 1	Ch 11
5	Sep 5	Tu	Cell Communication 2	Ch 11
6	Sep 7	Th	Metabolism 1*	Ch 8
7	Sep 12	Tu	Metabolism 2	Ch 8, 9
---	Sep 14	Th	<i>Exam 1 (lectures 1-7)</i>	-----
8	Sep 19	Tu	Metabolism 3	Ch 9
9	Sep 21	Th	Photosynthesis	Ch 10
10	Sep 26	Tu	Cell Cycle; Mitosis	Ch 12
11	Sep 28	Th	Cardiovascular System 1	Ch 42.1 - 42.4
12	Oct 3	Tu	Cardiovascular System 2	Ch 42.1 - 42.4
13	Oct 5	Th	Respiration 1**	Ch 42.5 - 42.7
---	Oct 10	Tu	<i>Exam 2 (lectures 8-13)</i>	-----
---	Oct 12	Th	<i>Fall Recess – No class</i>	-----
14	Oct 17	Tu	Respiration 2	Ch 42.5 - 42.7
15	Oct 19	Th	Immunity 1	Ch 43
16	Oct 24	Tu	Immunity 2	Ch 43
17	Oct 26	Th	Fluid and Electrolyte Balance 1	Ch 44
18	Oct 31	Tu	Fluid and Electrolyte Balance 2	Ch 44
19	Nov 2	Th	Endocrine System 1	Ch 45
---	Nov 7	Tu	<i>Exam 3 (lectures 14-19)</i>	-----
20	Nov 9	Th	Endocrine System 2***	Ch 46
21	Nov 14	Tu	Neuronal Signals 1	Ch 48
22	Nov 16	Th	Neuronal Signals 2	Ch 48
23	Nov 21	Tu	Neuronal Signals 3	Ch 48
---	Nov 23	Th	<i>Thanksgiving Break – No class</i>	-----
24	Nov 28	Tu	Motor System 1	Ch 50.5
25	Nov 30	Th	Motor System 2	Ch 50.5
	Dec 7	Th	<i>Exam 4, 11:00 am (lectures 20-25)</i>	

* Friday, September 8 is the last day to drop without a “W” and with tuition refund.

** Friday, October 6 is the last day to drop without a “W” on transcript only and without tuition refund.

*** Friday, November 10 is the last day to drop with a mark of “W”.

A. General Course Description and Policies

Catalog Description

Biological Sciences 220Lg – General Biology: Cell Biology and Physiology (4 units)
In-depth survey of key topics related to advances in our knowledge of cellular biology and physiology; cell composition/metabolism; gene action; organism structure and function. *Recommended preparation:* high school chemistry; BISC 120Lg or BISC 121Lg. *Note:* This course carries GE credit but it is intended for a specific group of students rather than a general student audience. It is part of the curriculum for majors and pre-professional students.

Instructors

Albert Herrera HNB 116 Phone 213-740-9177 aherrera@usc.edu

To meet with Dr. Herrera (via Zoom):

- Q&A Sessions will be held twice weekly to discuss course material (see schedule below).
- Office hours for discussion of confidential matters will be held by appointment.

Laboratory Manager

Dr. Brett Spatola, ZHS 362, spatola@usc.edu, 213-740-6078

Office hours: Open door policy

Laboratory Instructors

Prof. Nancy Castro, ZHS 256, ncastro@usc.edu (SEA-PHAGES Genomics lab sections)

Kayla Love, kaylalov@usc.edu (traditional lab sections)

Danny Osorio, daosorio@usc.edu (traditional lab sections)

Textbooks

- *Campbell Biology*, by Reece et al., 12th edition, 2020
N.B. – Although the 12th edition is the official textbook for the class, it is not substantially different from the 11th edition or even the 10th edition. Students interested in saving money may opt for one of the older editions.

Website <https://blackboard.usc.edu/>

- We will post all course materials, information, recordings, announcements, and grades on Blackboard until the end of the semester. Blackboard is intended only for appropriate, course-related activities. Use for other purposes will result in disciplinary action.

Lectures Note: *All lectures will be presented remotely, via Zoom. Lab sections will be held in-person and online as described below.*

- Lectures will be given via live (synchronous) Zoom sessions on Tuesdays and Thursdays, 9:30-10:50 am PDT. The sessions will start with students' video and audio muted, but students are encouraged to turn on their cameras and audio if possible. Questions during lecture are encouraged. Video and audio recordings of lectures will be posted on Blackboard the same day.
- We do not recommend these recordings as a substitute for regular participation in the live lectures. Use them to fill gaps in your notes, review difficult material, and as a substitute for the occasional missed lecture. *It would be a serious mistake to use the recordings as an excuse to procrastinate. Given the breadth and depth of the material, you must not fall behind. Keep up with the lecture schedule!*

Laboratory (See Part B below for the complete laboratory syllabus)

- The lab portion of the course will be offered in person, in ZHS 460 or ZHS 369 (see Schedule of Classes for lab room assignments).
- Lab sections 13023, 13031, and 13178 are “SEA-PHAGES” Genomic sections. See B1, below, for a description of these sections.
- Lab sections 13024, 13025, 13026, and 13030 will cover traditional topics in a course of this sort. See B2, below, for a list of topics and a schedule.
- The laboratory is an integral and essential component of the course, intended to give you experience with the processes, tissues, and concepts discussed in the lecture part of the class, and to deepen your understanding of the scientific literature and science as a process.
- Part B of this syllabus describes the purposes, policies, and procedures of the laboratory.
- Performance in the laboratory will account for one-third of each student’s grade.

Lecture Exams

- Times and coverage of lecture exams are as follows. All times are PDT.
Exam 1: Thursday, Sep 14, 9:30 - 10:30 am, covering lectures 1-7
Exam 2: Tuesday, Oct 10, 9:30 - 10:30 am, covering lectures 8-13
Exam 3: Tuesday, Nov 7, 9:30 - 10:30 am, covering lectures 14-19
Exam 4: Wednesday, Dec 7, 11:00 am - 1:00 pm, covering lectures 20-25
- Lecture exams will be administered online via Blackboard and will consist entirely of multiple choice and true/false questions. You must be logged in to Zoom (with your camera on) for the duration of the exam. We will announce details of exam administration on Blackboard before each exam. Lecture exams will only cover lecture topics; laboratory topics will be covered on separate lab exam and assignments. Please note: *Exam questions will not ask for rote repetition of information that can be easily memorized or looked up. Rather, questions will require you to use the lecture information to solve novel problems (see comments on quizzes below). Be prepared!*

Instructor-Led Exam Reviews

- For all 4 lecture exams, Dr. Herrera will hold an online review session via Zoom just before the exam. We will announce dates and times. We will record and archive the exam reviews.

Twice Weekly Question & Answer Sessions

- Dr. Herrera will host live Q&A sessions via Zoom. Q&A sessions will be held on Tuesdays 1:00-1:50 pm and Thursdays 4:00-4:50 pm. All Q&A sessions will be recorded and posted on Blackboard.
- *Although they are not required, it is highly recommended that you participate in the Q&A sessions as often as you can. Don’t feel pressure to ask “good” questions, or any questions at all. Just listening is fine, as is asking straightforward questions like “Can you re-explain...,” or “I just don’t understand...”. These are also great opportunities to get to know your instructor better. Besides answering questions, advice may be given on studying, time management, preparing for medical school and other graduate/professional programs, research opportunities, etc. Frequent attendance at Q&A sessions is one of several factors that favor boosting your grade in borderline cases (see Grading, below).*

Instructor Office Hours

Please email Dr. Herrera for individual office hour appointments via Zoom. Office hours are intended for discussion of individual, confidential matters such as grades. Course subject matter and other public issues should be discussed in Q&A sessions so all students can benefit from the interchange.

Lecture Quizzes

- A small percentage of the overall grade will be based on 13 quizzes, administered online via Blackboard. The quizzes will be posted by 5:00 pm each Friday beginning August 25 and continuing through December 1. Quizzes must be completed by 9:00 am the following Tuesday. For each quiz, questions will cover the previous week's material. Answers to the quiz questions will be posted in the morning of the Tuesday deadline. Once posted, quiz answers can be discussed at any of the subsequent Q&A sessions. Here is the quiz schedule:

Quiz Number	Posted by 5 pm on Friday	Deadline 9 am on ...
1	Aug 25	Tuesday, Aug 29
2	Sep 1	Tuesday, Sep 5
3	Sep 8	Tuesday, Sep 12
4	Sep 15	Tuesday, Sep 19
5	Sep 22	Tuesday, Sep 26
6	Sep 29	Tuesday, Oct 3
7	Oct 6	Tuesday, Oct 10
8	Oct 20	Tuesday, Oct 24
9	Oct 27	Tuesday, Oct 31
10	Nov 3	Tuesday, Nov 7
11	Nov 10	Tuesday, Nov 14
12	Nov 17	Tuesday, Nov 21
13	Dec 1	Tuesday, Dec 5

- Our intention is to make these lecture quizzes challenging, to help you prepare for the more point-heavy lecture exams. *Being able to look up answers and memorize is only the first step. To do well in this course, you must also be able to apply your knowledge to solve novel problems.* The quizzes are designed to give you low-stakes practice at this and thus gauge your level of preparation for exams.
- *This approach will only work, however, if you take the quizzes seriously and responsibly.* You may consult your textbook and any other printed or electronic material. You may also discuss the quiz questions with fellow students, if those discussions focus on understanding the underlying principles. You should not simply share or reveal your answers to other students, for several reasons. First, you will not know until after the deadline whether your answer is correct. Second, you will deprive that student of a learning opportunity. Third, you will diminish your own chances for a better grade by broadcasting your hard-won answers. The quizzes will require a disproportionately large amount of effort – on our part to craft challenging questions, and on your part to discern and understand the correct answers. It is likely that students who cheat by merely copying other students' quiz answers will pay a price on exam days. Please don't be one of those students.
- In recent years, most students came to see the quizzes as one of the most challenging parts of the course, but also one of the most valuable. If you take the quizzes seriously, we think you will come to the same conclusion.

Grading

- All grades will be posted on Blackboard. Points associated with the lecture (exam scores, online quiz points) will be posted on the Blackboard site for the lecture. Points associated with the lab (lab exam, lab report, quizzes, homework assignments, participation, presentation, discussion of other presentations) will be posted on the Blackboard site for the laboratory. We will try diligently to

maintain these Blackboard gradebooks accurately, but mistakes may occur. Please check your scores often and notify your Lab Instructor or the Lab Manager as soon as possible if you notice errors.

- After each lecture exam, an advisory curve will be posted to help students gauge their standing in the class.
- Final grades will be determined according to a curve. Any score within 10 points of the next highest grade will be considered a borderline grade. In such cases, instructors will consider whether to add up to 10 points to increase the grade to the next step. These points will be awarded based on a subjective evaluation of factors such as participation in the laboratory, attendance at Q&A sessions, effort, achievement relative to abilities, background, record of improvement, and other mitigating circumstances.
- If necessary, laboratory scores will be adjusted to correct for differences in grading between Laboratory Instructors.
- Points will only be given for assignments listed in the syllabus. No extra credit will be given.

	Item	Pts Each	Number	Total	Portion Totals
Lecture	Lecture Exams	150	4	600	Lecture = 639 pts
	Online Quizzes	3	13	39	
Lab	Lab Assignments	-	-	-	Lab = 361 pts
					Course total = 1000 pts

Impairments Affecting Your Performance

- Students occasionally encounter difficulties that affect their academic performance, such as illness, accidents, bereavement, depression, anxiety, learning disabilities, and other problems. If you encounter such difficulties, please contact one of the support services listed below, or bring them to the attention of one of the instructors. We may be able to offer accommodations. All such discussions will be confidential. Please seek help as soon as you feel your performance or well-being is affected.

Support Services

- Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents as soon as possible. Reporting such incidents is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. A list of offices to which one can report such incidents, as well as sources of support for other issues, follows.
- Student Health Counseling Services (213) 740-7711 – on call 24/7 engemannshc.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.
- National Suicide Prevention Lifeline (800) 273-8255 – on call 24/7 suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress.
- Relationship & Sexual Violence Prevention Services (213) 740-4900 – on call 24/7 engemannshc.usc.edu/rsvp
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.
- Office of Equity and Diversity - Title IX (213) 740-5086 equity.usc.edu, titleix.usc.edu
Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

- Bias Assessment Response and Support (213) 740-2421 studentaffairs.usc.edu/bias-assessment-response-support Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.
- Office of Disability Services and Programs (213) 740-0776 dsp.usc.edu Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs. Please see section below entitled "Students with Disabilities" for important course-specific information.
- USC Support and Advocacy (213) 821-4710 studentaffairs.usc.edu/ssa Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.
- Diversity at USC (213) 740-2101 diversity.usc.edu Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.
- USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – on call 24/7 dps.usc.edu, emergency.usc.edu Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.
- USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call dps.usc.edu Non-emergency assistance or information.

Exam Policies

- If you feel an error was made in the grading of an exam question, you may submit the question for a re-grade according to the following procedure. First, prepare a written statement explaining why your answer deserves more credit, using the Regrade Request Form available on Blackboard. Second, submit this statement to your Laboratory Instructor within one week of when the exam was returned to you. *The entire answer will be re-graded, not just the part you think deserves more credit. In addition, the instructors will review the grading of the entire exam to check for errors in grading. Your grade may go up or down as a result of this re-examination.* Be aware that we usually make copies of corrected exams before we return them, to ensure that students do not alter their answers before submitting them for a re-grade. Altering an answer is considered a serious violation of academic integrity. Please see the section on Academic Integrity (below) for additional information.
- No make-up exams will be given. No extra credit assignments will be given.
- You may be excused from an exam in the event of a documented illness, emergency, or other serious problem beyond your control. *No other excuses for missing exams will be accepted.* If you miss an exam or quiz for a legitimate reason, and wish to ask for an accommodation, you should proceed as follows. Within 48 hours of the start of the missed exam, email to the Lab Manager a request that you be excused. In the case of illness, this request must include either an official letter from your doctor stating that you were too sick to take the exam, or your doctor's name and contact information with permission for us to contact the doctor for a limited discussion of your condition. Note that neither you nor the doctor need tell us the nature of your illness. If you miss an exam for non-illness related reasons, you must provide similarly convincing documentation of the emergency to the Lab Manager within a week. If we judge your excuse to be valid, we will give you a grade for the missed exam equal to the "curved" average of your grades for the equivalent exams that you did take. Except in extraordinary circumstances, we will make accommodations for only one missed lecture exam. If your excuse is judged not to be valid, or you do not provide it within the allotted time, you will receive a score of zero for the missed exam.
- If you miss Exam 4 and you provide a convincing, well-documented excuse to the Lab Manager within 48 hours of the start of the scheduled exam time, a course grade of Incomplete (IN) will be assigned. It will be your responsibility to contact the instructors to arrange for a make-up version of Exam 4 so

that a final grade can be assigned. You will have a year to complete the requirements for removal of the IN. After this, your grade will change to an IX (Lapsed Incomplete), which counts as an F in the GPA. If you miss Exam 4 and do not submit a valid excuse, a course grade will be calculated based on your other scores and a zero for Exam 4.

- Each student must take Exam 4 at the designated time, according to the regular final examinations schedule. Keep this in mind as you plan your studying for this and other courses during the final exam period. Do not make travel plans that conflict with your designated Exam 4 time.

Supplemental Instruction

- We strongly recommend that students participate actively in the peer-led Supplemental Instruction program (<http://dornsife.usc.edu/supplemental-instruction/>). The SI leaders will hold regular study sessions beginning in the second week of classes. They will also conduct review sessions before each exam. Further information about the SI program as well as schedules and weekly worksheets can be found at <http://www.usc.edu/si>.
- The Supplemental Instruction Leader for BISC 220 will be TBN. Contact them at bisc220si@gmail.com. The schedules for SI sessions and exam reviews will be posted at www.dornsife.usc.edu/session-schedules. SI leaders are selected for the high grades they earned in assigned courses and for their overall academic strength, success in advanced biological studies, and superior communication skills. We highly recommend them as sources of academic and pre-professional advice.

Academic Integrity

- Our university depends on honesty, integrity, and ethical behavior among its members. Among other things, students' ethical behavior includes respecting the intellectual property of others, submitting individual work unless otherwise directed by the instructor, protecting one's own academic work from misuse by others, and avoiding the use of another's work as one's own.
- We have reliable, time-tested methods for detecting cheating, plagiarism, and other violations of academic integrity. *Please note that sanctions for violations are severe.* This is necessary to protect the integrity of grades and the academic process. The minimum sanction is usually an F for the course. Suspension or expulsion from the university is also possible in egregious cases or for repeat offenses.
- Here is a partial list of actual violations that have been perpetrated by BISC 220 students in recent years. The numbers in parentheses refer to relevant paragraphs in the University Governance section of SCampus (see resource 5 in the list below). *Most of these students received grades of F and were reported to the Office of Student Judicial Affairs and Community Standards.*
 1. Copying answers from other students during lecture or lab exams. (11.13)
 2. Submitting lab reports containing substantial portions plagiarized from other students. (11.11, 11.12)
 3. Use of Blackboard resources for commercial gain (11.19)
 4. Selling class notes and material downloaded from Blackboard to a web-based company that re-sells such material. (11.12B)
 5. Re-submission of a lab report written by the same student in an earlier semester. (11.16)
 6. Altering answers on a graded exam and submitting the altered exam for re-grading. (11.13B)
 7. Continuing to write answers on an exam after time has been called. (11.21)
 8. Unauthorized use of personal electronic devices, e.g., smartphones, during exams. (11.13)
 9. Students using multiple clickers to gain participation points for non-attending students. (11.18)*- All of these offenses were considered serious and resulted in disciplinary action. Do not do them!*
- Resources on academic integrity standards, policies, and expectations:
 1. Trojan Integrity: A Guide to Understanding and Avoiding Academic Dishonesty: <https://sjacs.usc.edu/files/2015/03/tio.pdf>
 2. Trojan Integrity: A Guide for Avoiding Plagiarism: https://dornsife.usc.edu/assets/sites/903/docs/Trojan_Integrity_-_Guide_to_Avoiding_Plagiarism.pdf

3. Overview of Academic Integrity: <https://sjacs.usc.edu/files/2015/11/Academic-Integrity-sheet-2013.pdf>
4. Tutorials on Academic Integrity: <https://libraries.usc.edu/research/reference-tutorials>
5. SCampus (see especially sections 11, 13, 15 and Appendix A): <https://policy.usc.edu/student/scampus/>
6. Scientific Misconduct: <http://policy.usc.edu/scientific-misconduct/>

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. A letter of verification for approved accommodations can be obtained from OSAS. Be sure to email the accommodations letter (PDF) to Laboratory Manager Dr. Brett Spatola as early in the semester as possible, **preferably by September 8, 2023**. OSAS is located in GFS 120 and is open from 8:30 a.m. to 5:00 p.m., Monday through Friday. If a student's approved accommodation is limited to extra time on examinations, the teaching staff of BISC 220 will provide the accommodation. For any other accommodation, such as a private room, reader or a scribe, students must make prior arrangements with OSAS two weeks before the exam date. For more information please visit the following website: <https://osas.usc.edu/>, or contact them at (213) 740-0776 or osasfrontdesk@usc.edu.

Policies Concerning Student-Athletes

Student-athletes may not be penalized when University-sanctioned competitions conflict with course activities or examinations. When a class will be missed for a sanctioned competition, it is the student-athlete's responsibility to approach the instructor in advance. The student-athlete must provide the instructor with a letter from Denise Kwok, Director of *Student-Athlete Academic Services* (SAAS) <https://saas.usc.edu/academic-support-services/travel/excused-absence-letter/>. The letter must certify that the competition is a University-sponsored event that deserves accommodation. Accommodations will not be made for other types of conflicting events. Details on the University's policy can be found at: https://www.provost.usc.edu/ocaa_guidelines/. Arrangements for the accommodation must be agreed upon in advance of the event. If multiple team members will be absent, each must make an individual arrangement with the instructor. If an assignment is due on the date when class is missed, the instructor may require that it be turned in before the missed class or at the first class meeting after the student returns. If a test has been scheduled for the date when class is missed, the instructor may arrange with SAAS to have the test administered by an academically qualified proctor (not a coach) during the trip. Alternatively, the instructor may agree to pro-rate the exam score, i.e., substitute the missing exam score with a score based on the average of the student's scores for the other exams compared to the class average for those exams.

Email Communication

To ensure privacy, only students' USC accounts (*usc.edu* domain name) can be used for email communications regarding confidential matters. Other email accounts cannot be used. Students are responsible for understanding the content of official messages that instructors send to their USC accounts. Therefore, each student must check their USC email regularly and make sure their account is not over quota, so new messages can be received.

Emergency Preparedness / Course Continuity

If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* (<http://emergency.usc.edu/> or 213-740-9233) will provide information related to safety and course continuity. We expect that instruction will be continued by means of Blackboard, teleconferencing, and other technologies. Alternative assignments may be given if classes are canceled for prolonged periods. If

you have not already done so, please register with TrojansAlert (<https://trojansalert.usc.edu/>) to facilitate communication during emergencies.

Students Who Are Repeating the Class

The faculty and staff of this course are dedicated to helping you succeed academically. If you are repeating this class because you had to withdraw, earned an unsatisfactory grade, or need to remove a mark of IN (Incomplete) from a previous semester, please take advantage of all the help we have to offer. You should try to attend every lecture, review the material promptly, complete all online and lab assignments to the best of your ability, prepare early for exams, and be ready to change your approach if initial results are not satisfactory. Above all, manage your time to maximize your academic and personal success. Please identify yourself and seek help from the instructors, Lab Manager Dr. Brett Spatola, and your SI Leader. We are here to help!

B1. BISC 220L General Biology Laboratory: SEAPHAGES Genomics (Sections 13023, 13031, 13178)

Course Overview

This course offers students an opportunity for a mentored research experience where they will learn how to apply the scientific method to make new discoveries and contribute to scientific knowledge.

A previously isolated phage genome that was sequenced by Howard Hughes Medical Institute will be provided to our lab section. Students will develop their research experience by learning how to annotate the genome of this phage. They will compare the genes identified in their phage to other phages that have been sequenced by the SEA-PHAGES program in order to appreciate the diversity of actinobacteriophages. At the end of the semester each student will be included as a co-author when the genomes are submitted to GenBank. Students in the course are part of the National Research Initiative funded by the Howard Hughes Medical Institute.

This laboratory class won't be like other classes you've taken or may take. There will be minimal lecturing by faculty, and we will instead utilize class time to do research and discuss scientific concepts relevant to our work. This course is an inquiry-guided learning experience, and it is meant to be students' first mentored research project. Some gene calls are more difficult than others, and sometimes there is no "correct answer." Students will be challenged to make the best calls they can with the current information that is available.

Faculty

Name	Email	Office	Office hours
Nancy Castro, PhD	ncastro@usc.edu	ZHS 256	TBD

Section Meeting Times

Section Meeting Times	Section/Course Number	Instructors	Email
Thursday 11:00 – 1:50	13031	Nancy Castro	ncastro@usc.edu
Thursday 2:00 – 4:50	13023	Nancy Castro	ncastro@usc.edu
Thursday 5:00 – 7:50	13178	Nancy Castro	ncastro@usc.edu

Textbook No textbook is required. The required readings for the course include the SEA-PHAGES Bioinformatics Guide, content unique to this course, and recently published papers on the course topic. They will be available on Blackboard.

Blackboard Course materials and announcements will be posted on Blackboard. You are expected to check regularly for lecture notes, assignments, announcements, and other material. Main communication with the class will be via Blackboard announcements. If you need help accessing BB, contact the computer help desk at 213-740-5555.

Course Policies **Attendance is mandatory for each lab session and there will be no make-up labs.** BISC 220L SEA-PHAGES section is an authentic, research-based course, so making regular progress on your research project is dependent on regular lab attendance and group work. Any absence must be properly excused by a healthcare provider for an illness or a University official for University business. If a class is missed due to technology problems, please contact the lab instructors via email as soon as possible to determine the best way to make up the lab session and group work.

Objectives At the end of the course, students will be able to:

- a) Use a variety of computational software to correctly identify genes in phage genomes that produce functional biological macromolecules in bacteriophages.
- b) Describe basic bacteriophage genome properties and how genes of known function work in the phage life cycle.
- c) Appreciate the diversity of phage genomes and discuss how little is currently known about the functions of most phage genes.
- d) Read and assess primary literature and discuss what is currently known about phage biology and gene function.
- e) Submit finished gene calls in a timely and complete fashion.
- f) Clearly and concisely communicate scientific findings to others during group discussions, class presentations, and through a scientific laboratory report.
- g) Undergraduate students will present a research poster that summarizes our research findings and present this work to members of the university.

Grading Laboratory point distribution (total 361 points):

Lab Notebook	60 pts (15 x 4)
Assignments and Quizzes	60 pts (12 x 5)
Genome Annotation	111 pts
Peer Review of Annotation	20 pts
Poster Project	60 pts
Journal Article Presentation	50 pts

Assignments and Quizzes – There will be assignments due throughout the term that will assess your overall understanding of the course objectives. Some may be given during class and some may be assigned as out-of-class work. Many of these are written into the course schedule, but additional assignments may arise and due dates may be adjusted throughout the semester. Unless otherwise noted in the course schedule, all assignments are due at the beginning of class. Any assignment handed in late will be docked 10% and will not be accepted after two days late without special permission from the instructor. Pre-lab assignments, such as quizzes and pre-lab notebook entries, are considered to be essential preparation for lab activities and will not be accepted late. Please note that arriving late to class or being absent for any reason does not alter the due date for any assignment.

Genome annotation – Students will work in teams to complete a thorough annotation of a bacteriophage genome. This group project will take several weeks to complete.

Lab Notebook – Students are required to use Google Docs or Google Sheets to maintain an electronic notebook that can be shared with your group and the instructors. Documenting your work in the lab is an essential part of developing your skills as scientists. Whenever possible you are expected to prepare your lab notebook with the title, objective, explanation, and protocol for the day's work. We will do the majority of data collection and analysis during the lab period. The notebooks are timestamped by the electronic notebook provider allowing the instructor to see when your work was completed. While we strongly encourage scientific discussions with your peers, your assignments and analysis of experiments in your notebook must be your own work.

Final Project and Poster – Students will be working in groups to collect data and analyze experiments. At the end of the semester, each group will assemble a scientific poster to be displayed in the Biological Sciences department and can be presented at a later time at the undergraduate research symposium.

Names/Nicknames and Pronouns

Course rosters are provided to instructors by the University with students' legal names as they were originally provided to the University, but we want to be sure that we are addressing you properly. We will gladly honor your request to be addressed by an alternate name or gender pronoun(s) that differ from your official University records. Please let us know of this early in the semester so that we can update our records.

Email Policy

University addresses will be used for all email correspondence. Please remember that emails are a professional correspondence and write them accordingly. Every attempt will be made to respond to emails within 24 hours of receiving them during the week. Email response during the weekend may take up to 48 hours for a response.

Students should also read e-mail sent to their University account on a regular basis. Failure to read and react to University communications in a timely manner does not absolve the student from knowing and complying with the content of the communications.

Assignment Re-Grading Policy

You may request a re-grade of any portion of an assignment by submitting your request in writing and explaining why you think the grading was in error. You must include a detailed justification for the correctness of your answer, including references to the text used in the course (text, page, paragraph). This request must be submitted to the instructor within one week (5 business days) after the date the assignment is returned/grade is posted to Canvas. Unless the re-grade is due to an additional error, please be aware that your entire assignment may be reevaluated and any question that was graded incorrectly (in your favor) may also be re-graded resulting in points deducted from your total. Re-grading requests raised beyond a week after an assignment has been returned/grade is posted will not be addressed.

B2. BISC 220 Laboratory Syllabus: Traditional Lab (Sections 13024, 13025, 13026, and 13030)

Laboratory Instructors: Kayla Love (kayllov@usc.edu), Danny Osorio (daosorio@usc.edu)

Lab Manager: Brett Spatola, ZHS 362, spatola@usc.edu

Laboratory Schedule:

Lab #	Date	Laboratory	Post-lab assignment
	August 24-25	<i>No labs scheduled</i>	<i>Lab instructor TBD</i>
1	August 31- September 1	Lab safety and syllabus	Lab safety, Labster
2	September 7-8	Macromolecules	Research article + questions
3	September 14- 15	Experimental design	Intro to macromolecules, Labster
4	September 21-22	Enzyme	Glucose/milk table + figure
5	September 28-29	Photosynthesis	Pigment extraction, Labster
6	October 5-6	Fermentation	Sample lab report + questions; <u>lab report assigned</u>
	October 12-13	<i>No labs scheduled</i>	<i>Fall break</i>

7	October 19-20	Cell membrane and transport	Cell membrane and transport, Labster
8	October 26-27	DNA and restriction enzymes	Lab report due; plasmid and restriction digest
9	November 2-3	Blood and antibodies	Antibodies, Labster
	November 9-10	<i>No labs scheduled</i>	<i>Veteran's holiday</i>
10	November 16-17	LAB EXAM	
	November 23-24	<i>No labs scheduled</i>	<i>Thanksgiving break</i>
11	November 30-December 1	Classic Literature Presentation	

Some schedule adjustments may occur during the semester.

Required Textbook:

BISC 220 Laboratory Manual. PDF versions will be posted on Blackboard and printouts (or electronic versions) must be brought to lab each week.

Lab point distribution:

The laboratory portion (361 points) will count for ~36% of your final course grade, distributed as follows:

Labster simulations (5 x 10 points each)	50 pts
Post-lab assignments (2 x 10 points each)	20 pts
Research article + questions	11 pts
Lab report	40 pts
Sample lab report + questions	10 pts
Lab exam	100 pts
PPT presentation	30 pts
Lab manual (5 points per chapter)	50 pts
Lab participation (5 points per lab)	50 pts

Lab performance guidelines:

You are required to attend all lab sessions. Any unexcused absences will seriously affect your evaluation and lab participation points. Come to lab on time. DO NOT make any other appointments for the time you are scheduled to be in lab.

You are required to wear gloves, closed toe shoes, long pants and a knee-length lab coat 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.

Labster simulations:

There will be Labster simulations during the semester. These simulations reinforce topics learned during lab and offer learning experiences that usually can't be completed logistically while in lab. Please visit the labster website for troubleshooting tips if you encounter any technical issues:

<https://help.labster.com/students/collections/2286564/sections/3094204/articles/3944461-basic-labster-troubleshooting/>

Lab manual:

During each lab students need to record their results (drawings, observations, calculations) in their lab manual. Tables need to be filled and all post-lab questions answered. Each student is required to show their lab instructor the lab manual before leaving the lab and obtain their signature. Lab manuals will be checked periodically throughout the semester.

Post-lab assignments:

During the semester you will have homework assignments, based on the data you obtain or important concepts from your lab experiments. Assignments are explained in the lab manual and more information can be found on Bb. Post-labs will be due 1-week after being assigned.

Lab report:

Lab reports must be uploaded on Blackboard via the Turnitin submission link. This program will detect any forms of plagiarism (i.e. using a previous student's report, copy/paste from research articles, etc.) and use of AI-generated tools. Please create your own original lab report and do not share/collaborate with other students. Any violations will result in 0/40 points, and possible repercussions with Student Judicial Affairs (SJACS).

A paper copy turned in at the beginning of the lab session is optional and dependent on the lab instructor. Lab report guidelines will be posted on Bb (<https://blackboard.usc.edu/>) in the beginning of the semester.

Lab exam:

The cumulative lab exam will test your understanding of the topics, concepts and exercises covered during the semester. It will be a mix of multiple-choice, true/false, fill in the blank, and/or short response questions.

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

If you miss a lab exam due to a serious illness, you must present a valid excuse to the Lab Manager Dr. Spatola (spatola@usc.edu) within 48 hours of the missed exam. A valid excuse is considered to be an official note from your doctor or the summary of your visit from the USC Engemann Student Health Center. Note that neither you, nor your doctor, need to tell us the nature of your illness; we just want to verify whether you were too ill to take the exam. If you miss an exam for non-illness related reasons, you must provide similarly convincing documentation of the emergency to the Lab Manager. If we judge your excuse to be valid, you will be allowed to take the exam in another lab section that week. If you do not have a valid excuse or fail to provide it within the allotted time, you will receive zero points for the missed lab practical exam.

Missed labs:

If you miss a scheduled lab due to illness or emergency, please contact your lab instructor and/or the lab manager spatola@usc.edu immediately to see whether it will be possible to make up the missed lab.

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 the lab manager (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 Blackboard: <https://blackboard.usc.edu>. Your lab scores will be posted under your LAB SECTION. Be sure to check for additional postings on a regular basis. It is the student's responsibility to immediately notify their lab instructor or lab manager in the event of any mistakes, so please check your Blackboard scores weekly.

Changing a lab section:

During the first three weeks of classes, you are able to change your lecture or lab section by dropping your current section and adding your new choice through USC Web registration System. You can switch into a new lab section only if it is open (if it has less than 20 students). If a lab section is currently closed, you must wait until other students drop before you can switch into that section. No changes are allowed after the third week of classes (i.e., after the second week of lab). You are responsible for printing/saving your grade report from Blackboard before changing sections, as scores may be irrevocably lost from the Blackboard system when students change sections. The same applies if changing lecture or lab sections.