

Prof. Albert Herrera
BISC 220 (General Biology: Cell Biology and Physiology), Fall 2025
Schedule for Tu/Th 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 26	Tu	Course Introduction; Cells 1	Ch 6
2	Aug 28	Th	Cells 2	Ch 6
3	Sep 02	Tu	Cell Membranes	Ch 7
4	Sep 04	Th	Cell Communication 1	Ch 11
5	Sep 09	Tu	Cell Communication 2	Ch 11
6	Sep 11	Th	Metabolism 1*	Ch 8
7	Sep 16	Tu	Metabolism 2	Ch 8, 9
---	Sep 18	Th	<i>Exam 1 (lectures 1-7)</i>	-----
8	Sep 23	Tu	Metabolism 3	Ch 9
9	Sep 25	Th	Photosynthesis	Ch 10
10	Sep 30	Tu	Cell Cycle; Mitosis	Ch 12
11	Oct 02	Th	Cardiovascular System 1	Ch 42.1 - 42.4
12	Oct 07	Tu	Cardiovascular System 2	Ch 42.1 - 42.4
---	Oct 09	Th	<i>Fall Recess – No class**</i>	-----
13	Oct 14	Tu	Respiration 1	Ch 42.5 - 42.7
---	Oct 16	Th	<i>Exam 2 (lectures 8-13)</i>	-----
14	Oct 21	Tu	Respiration 2	Ch 42.5 - 42.7
15	Oct 23	Th	Immunity 1	Ch 43
16	Oct 28	Tu	Immunity 2	Ch 43
17	Oct 30	Th	Fluid and Electrolyte Balance 1	Ch 44
18	Nov 04	Tu	Fluid and Electrolyte Balance 2	Ch 44
19	Nov 06	Th	Endocrine System 1	Ch 45
---	Nov 11	Tu	<i>Exam 3 (lectures 14-19)</i>	-----
20	Nov 13	Th	Endocrine System 2***	Ch 46
21	Nov 18	Tu	Neuronal Signals 1	Ch 48
22	Nov 20	Th	Neuronal Signals 2	Ch 48
23	Nov 25	Tu	Neuronal Signals 3	Ch 48
---	Nov 27	Th	<i>Thanksgiving Break – No class</i>	-----
24	Dec 02	Tu	Motor System 1	Ch 50.5
25	Dec 04	Th	Motor System 2	Ch 50.5
	Dec 11	Th	<i>Exam 4, 11:00 am (lectures 20-25)</i>	

* Friday, September 12 is the last day to drop without a “W” and with tuition refund.

** Friday, October 10 is the last day to drop without a “W” on transcript only and without tuition refund.

*** Friday, November 14 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

TBN

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 brightspace.usc.edu/

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

Lectures

- Lectures will be given in the Montgomery Ross Fisher Building, room 340 (MRF 340) on Tuesdays and Thursdays, 9:30-10:50 am PDT. Questions during lecture are encouraged. Lectures will be recorded and archived via Zoom. 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 365 or ZHS 369 (see Schedule of Classes for lab room assignments).
- Lab section 13026 is a “SEA-PHAGES” Genomic sections. See B1, below, for a description of these sections.

- Lab sections 13023, 13024, 13025, 13030, 13031, and 13178 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 18, 9:30 - 10:30 am, covering lectures 1-7
Exam 2: Thursday, Oct 16, 9:30 - 10:30 am, covering lectures 8-13
Exam 3: Tuesday, Nov 11, 9:30 - 10:30 am, covering lectures 14-19
Exam 4: Thursday, Dec 11, 11:00 am - 1:00 pm, covering lectures 20-25
- Lecture exams will be administered in person, in MRF 340, and will consist entirely of multiple choice and true/false questions. Lecture exams will only cover lecture topics; laboratory topics will be covered on separate lab exam and assignments. For each exam, a practice version will be published approximately a week in advance. 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 Brightspace.
- *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. 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 12 quizzes, administered online via Brightspace. The quizzes will be posted by 5:00 pm most Fridays beginning August 29 and continuing through December 9. Please see the table below for the exact schedule. Quizzes must be completed by 9:00 am the following Tuesday. For each quiz, questions will cover the previous week's material. Answers to quiz questions will be posted on 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 ...	Covers Lectures
1	Aug 29	Tuesday, Sep 02	1, 2
2	Sep 05	Tuesday, Sep 09	3, 4
3	Sep 12	Tuesday, Sep 16	5, 6
4	Sep 26	Tuesday, Sep 30	7, 8, 9
5	Oct 03	Tuesday, Oct 07	10, 11
6	Oct 10	Tuesday, Oct 14	12
7	Oct 24	Tuesday, Oct 28	13, 14, 15
8	Oct 31	Tuesday, Nov 04	16, 17
9	Nov 07	Tuesday, Nov 11	18, 19
10	Nov 14	Tuesday, Nov 18	20
11	Nov 21	Tuesday, Nov 25	21, 22
12	Dec 05	Tuesday, Dec 09	23, 24, 25

- 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 Brightspace. Points associated with the lecture (exam scores, online quiz points) will be posted on the Brightspace 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 Brightspace site for the laboratory. We will try diligently to maintain these 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	
	Online Quizzes	3	12	36	Lecture = 636 pts
Lab	Lab Assignments	-	-	-	Lab = 364 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
<https://safety.usc.edu/resources/counseling/>. Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. See also <https://safety.usc.edu/resources/well-being/>.
- National Suicide Prevention Lifeline Call or text 988. On call 24/7, see also <https://988lifeline.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. See <https://sites.usc.edu/client-services/> or <https://dps.usc.edu/safety-tips/sexual-assault-and-violence/>. 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. 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.
- Campus Support & Intervention (213) 740-0411, campussupport.usc.edu. Assists students, faculty, and staff in resolving complex personal, financial, and academic issues.
- USC Culture Journey (213) 740-8258, culturejourney.usc.edu. Formerly known as Diversity at USC, this site now focuses on the university's "six unifying values." See the site for more information. 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, available 24/7, 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](http://dps.usc.edu) - UPC: (213) 740-6000, HSC: (323) 442-1200, available 24/7, dps.usc.edu. Non-emergency assistance and information.

Exam Policies

- 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, personal emergency, or other serious problem beyond your control. *No other excuses for missing exams will be accepted.* You must explain your reason for missing the exam and provide relevant documentation to support your request. Note that the Student Health Center will not provide doctor's notes to verify illnesses. Their policy is described here: [Policy: Medical excuses for class absences – USC Student Health | Keck Medicine of USC](#). This webpage provides a Self-Verification Form that you can use to attest to your illness.
- 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 the Lab Manager with a request to be excused. Include an explanation of the circumstances and documentation as described above. For reasons other than illness, you must provide the Lab Manager with an explanation and documentation 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. If you miss an exam without a valid excuse, or you do not provide the excuse within the allotted time, you will receive a score of zero for the missed exam.
- Except in extraordinary circumstances, we will make accommodations for only one missed lecture exam. If you miss two lecture exams, you should withdraw from the class if it is before the withdrawal deadline. If your second missed lecture exam is Exam 4, you will receive a mark of IN (Incomplete) for the course.
- If you miss Exam 4 but took the first three exams, and you provide a convincing excuse and documentation 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 Brightspace 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. USC Student Handbook: [Living Our Unifying Values: The USC Student Handbook](#)
 2. Tutorials on Academic Dishonesty: [Academic Dishonesty | USC Libraries](#)

Students with Academic Accommodations

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 12, 2025**. OSAS is located in GFS 120 and their Testing Center is located in SSL 301. 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 an Excused Absence Letter from 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. 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 Brightspace, Zoom 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 - Department of Public Safety](#) 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 (Section 13026)

Course Overview This lab section 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	Monday 10:30 – 11:30 (zoom)

Section Meeting Times

Section Meeting Times	Section/Course Number	Instructors	Email
Friday 11:00 – 1:50	13026	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.

Brightspace Course materials and announcements will be posted on Brightspace. You are expected to check regularly for lecture notes, assignments, announcements, and other material. Main communication with the class will be via Brightspace 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:

- Use a variety of computational software to correctly identify genes in phage genomes that produce functional biological macromolecules in bacteriophages.
- Describe basic bacteriophage genome properties and how genes of known function work in the phage life cycle.
- Appreciate the diversity of phage genomes and discuss how little is currently known about the functions of most phage genes.
- Read and assess primary literature and discuss what is currently known about phage biology and gene function.
- Submit finished gene calls in a timely and complete fashion.
- Clearly and concisely communicate scientific findings to others during group discussions, class presentations, and through a scientific laboratory report.
- 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 = 364 points):

Lab Notebook (4 x 15pts)	60 pts
Quizzes (7)	40 pts
Genome Annotation	114 pts
Research Poster	60 pts
Peer Reviews (2 x 20pts)	40 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 220L Traditional Laboratory Syllabus (Sections 13023, 13024, 13025, 13030, 13031, 13178)

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

Lab instructors: TBN

Laboratory Schedule*

Lab #	Date	Lab Topic	Post-Lab Assignment**
	Aug 28-29	No labs scheduled: Lab instructor TBD	
1	Sep 4-5	Lab safety and syllabus	Lab safety quiz
2	Sep 11-12	Macromolecules I	Research article + quiz
3	Sep 18-19	Macromolecules II	Unknown protein results
4	Sep 25-26	Enzymes	Lactase activity results
5	Oct 2-3	Fermentation	Lab report assigned (due before lab 7); Sample lab report + review
	Oct 9-10	No labs scheduled: Fall Recess	
6	Oct 16-17	Cell physiology	Lab report
7	Oct 23-24	Photosynthesis	Pigment extraction analysis
8	Oct 30-31	DNA/restriction enzymes	Restriction digest analysis
9	Nov 6-7	Blood/antibodies	Blood quiz
	Nov 13-14	Lab exam review	
	Nov 20-21	Lab exam	
	Nov 27-28	No labs scheduled: Thanksgiving Holiday	
	Dec 4-5	Classic Literature Presentation	

*Lab schedule changes may occur during the semester.

****Post-labs** will be due the week after they are assigned. For example, the “research article + questions” assignment will be due before the “scientific investigation I” lab. No late submissions or regrades.

Required Textbook BISC 220 Laboratory Manual. A PDF file for each lab topic will be posted on Brightspace, and printouts (or electronic versions) should be brought to lab each week.

Lab Point Distribution Total credit for the laboratory portion is 364 points, or about 36% of your final course grade. Points are assigned as follows:

Post-lab assignments	84 pts
Lab report	40 pts
Lab exam	100 pts
PPT presentation	50 pts
Lab Manual (5 points per chapter)	45 pts
Lab Participation (5 points per lab)	45 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. 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 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.

Lab Manual Chapters 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 the lab instructor a completed lab manual before leaving the lab. Lab manuals will be checked periodically throughout the semester. Electronic or paper copies are OK.

Post-Lab Assignments During the semester you will have homework assignments, based on the data you obtain or important concepts from your lab experiments/topics. Assignments are explained during lab more information can be found on Brightspace. Post-labs will be due 1-week after being assigned. No late submissions or regrade attempts.

Lab Report Lab reports must be uploaded on Brightspace 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 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 Brightspace 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 60-minutes exam with a mix of multiple-choice, true/false, fill in the blank, and/or short response questions.

If you miss a lab exam due to a serious illness, you must present a valid excuse to lab manager Brett (spatola@usc.edu) within 48 hours of the missed exam. 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 exam.

Missed Labs If you miss a scheduled lab due to illness or emergency, please contact lab manager Brett (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: 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.

Changing a Lab Section During the first three weeks of classes, you are responsible for changing 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 (i.e. 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 Brightspace before changing sections, as scores may be irrevocably lost from the Brightspace system when students change sections. The same applies if changing lecture or lab sections.