MIMG 103AL – Spring 2019 Syllabus
Research Immersion Lab in Virology

Instructor
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Please address all emails with “103AL-S19” and your lab section in email subject.

Office Location: 3801A Molecular Sciences Building
(Exit the lab classroom, turn left, walk into next building. First door on the right.)
Office Hours: days and times TBD by survey
Also by appointment (in-person OR online!) - https://doodle.com/AmandaFreise

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Director of Undergraduate Laboratory Curriculum

Class Time and Location
Lecture:  
All sections  
MW 3:30 PM – 4:45 PM  
Public Affairs 1270
F 3:30 PM – 4:45 PM  
Young Hall 3336
Lab:  
Section 1A  
TR 12:00 PM – 2:50 PM  
Young Hall 3370
W 2:00 PM – 2:50 PM  
Young Hall 3370
Section 1B  
WF 10:00 AM – 12:50 PM  
Young Hall 3370
W 10:00 AM – 10:50 PM  
Young Hall 3370

Course Requirements
MIMG 103AL is limited to MIMG majors. Requisites include Life Sciences 3, 4 and 23L, and MIMG 101. Attendance at lab and participation in lecture each week are mandatory. Selection of lab teams is done during the first week of lab.

NOTE: TO FULFILL DEGREE REQUIREMENTS, MIMG 103BL MUST BE COMPLETED IN FALL 2019 AS A FOLLOW-UP TO COURSE 103AL; OTHERWISE, YOU WILL NEED TO DROP 103AL AND TAKE A DIFFERENT COURSE.

Course Description
In 103AL/BL, you will collect samples from natural environments and design experiments to discover and characterize novel bacterial viruses (phages). You will then sequence and annotate the genomes of the phages you discover, and perform comparative genomics analyses. This is an authentic research experience in which you will participate in all aspects of the scientific process, from sample collection
through preparation of data for publication. Every student will be a **contributing author to a Genbank publication** of the phage genomes, as well as a potential **co-author on a peer-reviewed article**!

Working in teams, you will conduct self-directed research projects that incorporate techniques in microbiology, virology, and molecular biology in order to characterize the life cycle and phage-host dynamics of the phages you isolate. You will also characterize viral particles by electron microscopy (EM). You and your section will get to name your phages and select which phages are the best candidates for whole-genome sequence analysis.

The emphasis of this course is on reading and understanding scientific literature as well as improving your critical thinking skills such as ability to evaluate hypotheses or experimentally address scientific questions. Class activities also highlight critical aspects of the research process, including record keeping, ethics, laboratory safety and citizenry, mechanics of scientific writing, and delivery of scientific presentations. In addition, you will be introduced to the use of bioinformatics tools and computational analysis software necessary for genomic analyses.

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Student Learning Outcomes
(1) Demonstrate knowledge of key disciplinary concepts & their relationship to biological systems.
(2) Demonstrate knowledge of research project.
(3) Develop technical expertise/confidence through hands-on experience.
(4) Develop problem-solving skills associated with conducting experiments.
(5) Address scientific questions using quantitative, computational, and inquiry-related skills.
(6) Improve presentation skills (oral communication needed for seminar & poster presentations).
(7) Improve scientific writing abilities (written communication needed for research papers).
(8) Effectively work in both individual and collaborative contexts.
(9) Value research and its relevance to own life and society.
(10) Understand the process of scientific research.

Course Materials
1. 103AL Lab Manual – will be made available to you electronically via Box.
2. Permanently bound (non-spiral) laboratory notebook (composition notebook is fine), ball-point pen, and Sharpie marker(s).
3. USB flashdrive (for saving and transporting computer-generated data).
4. Laboratory Safety glasses. Must be purchased for the first week of lab.
5. Valid email account (the one on file with the Registrar’s office) and internet access to course management website, online instructional materials, and instructor/TA/student correspondence.
6. UCLA Box.com account. To activate your individual account, visit https://ucla.box.com/. You will be prompted to log in using your UCLA Logon ID. Do it through UCLA – you’ll get more storage.

All of these items or resources will be used in the lectures and labs starting the first week of instruction and therefore must be purchased or prepared by the first day of class.

Inclusivity
Diversity among students, faculty, and staff at UCLA should be celebrated. We believe that every student has the right to feel comfortable and safe. To this end, we strive to make the MIMG109 class a welcoming environment for all, and expect students, staff, and instructors to treat each other with dignity and respect. Statements or actions that disparage a person or group’s ethnicity, religion, sexual orientation, gender, gender identity, age, disability, or socioeconomic status will not be tolerated. If you have any concerns, please contact the instructor.

Communication and Providing Feedback
I encourage your feedback at any time throughout the quarter about things that are helping you learn, or things that aren’t helping. Please let communicate with me or with your TA if there are ways that we can improve the course to better support student learning.
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**Personal and Team Problems**
I understand that sometimes life makes it difficult to focus on schoolwork. If you are having a personal problem that affects your participation in this course, **please talk to me** to create a plan. There are many resources on campus that may be able to help and I am more than happy to assist you, even if it is just to offer a listening ear. **Please do not wait until the end of the quarter** to share any challenges that have negatively impacted your engagement and academic performance. The sooner we meet, the more options we will have available to us to support your overall academic success. If you are not comfortable speaking with me directly, please utilize the other student resources provided on CCLE in order to understand how to best achieve success in this course given your personal needs.

**Course Websites**
This course is paperless and different websites will be used to manage different aspects of the course.

**CCLE.ucla.edu**
All course materials and announcements will be posted to **CCLE**. All major assignments will be submitted electronically to CCLE. Feedback for these assignments will also be posted to this site.

**Gradescope.com**
Reading Assessment assignments will be submitted for grading through [https://gradescope.com](https://gradescope.com).

**Sign Up:**
Student Entry Code: 94JB6E
Name needs to be entered as “Last Name, First Name”
UCLA Student ID number needs to be entered

**UCLA.Box.com**
All Project Team data will be uploaded to designated course Box site ([https://ucla.box.com/](https://ucla.box.com/)). To activate your individual accounts, visit [https://ucla.box.com/](https://ucla.box.com). You will be prompted to log in using your UCLA Logon ID. Your account is automatically set up on your first visit to Box. If you already have an existing Box.com account follow the instructions to add or replace with a UCLA Box account: [https://www.it.ucla.edu/services/email-calendaring-collaboration/box/individual-box-accounts](https://www.it.ucla.edu/services/email-calendaring-collaboration/box/individual-box-accounts)

**Late Assignments and File Naming**
ANY assignments received after the time indicated on the due date will earn a maximum of 75% credit. A maximum of only 50% credit will be earned for assignments that are one day late (i.e submitted after 11:59 PM). No credit will be given for assignments that are more than one day late (i.e. more than 24 hours after due date and time). NO exceptions! Unforeseen problems sometimes do occur, so PLAN AHEAD and complete/submit the assignments early.

All assignments and files submitted digitally to the CCLE course page or Box **must** be submitted as an appropriately named file or they **WILL NOT BE GRADED**! Files names should have the following format: 103AL-W19_Assignment_Last_First.pdf (e.g. 103AL-S19_RA1_Freise_Amanda.pdf)
Grade Components

**Final Grades:** Grades are assigned on a straight scale (normalized to the highest points actually earned), without strict limits on the proportion of each grade. Note that there will be no grade inflation – A’s and B’s must be earned, but it is possible for every student to potentially earn an A if they meet all of the learning outcomes.

**Collaborative Points:** You and your classmates will be assigned to Project Teams and are expected to work together during laboratory, lecture, and outside the classroom according to your own arranged schedules. The score for the “collaborative points” that each student receives for an assignment will be the same score for his/her entire team. It is at my discretion to adjust collaborative scores if all members of the team are not contributing equitably to the research project and assignments.

In addition, you and your classmates are encouraged to communicate and work together in laboratory throughout the quarter. Thus, **40 of the 100 pts** that each student may earn for Lab Effort & Conduct will be based on an evaluation of collaborative efforts among students in each Project Team during the laboratory period. The score for the “collaborative points” that each student receives on for Laboratory Effort & Conduct, the Team Presentation, and the Science Communication Project will be the same score for their entire team; in this case may be an average score if teammates do not contribute equally. Note that most teams are comprised of 3-4 students, and teams may be rearranged at the discretion of the TA and instructor.

Point Distribution

<table>
<thead>
<tr>
<th>The final grade for MIMG 103AL will be calculated as follows:</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulfillment of lab research hours (mandatory)</td>
<td>0</td>
</tr>
<tr>
<td>Participation</td>
<td>100</td>
</tr>
<tr>
<td>Reading Assessments</td>
<td>160</td>
</tr>
<tr>
<td>Scientific and Professional Skill Development</td>
<td>50</td>
</tr>
<tr>
<td>Laboratory Conduct, Cleanup, &amp; Communication</td>
<td>200</td>
</tr>
<tr>
<td>Lab Record Keeping (Notebook, Annotation, &amp; Box Database)</td>
<td>215</td>
</tr>
<tr>
<td>Annotation Tutorial Participation</td>
<td>45</td>
</tr>
<tr>
<td>Final Annotation Report</td>
<td>50</td>
</tr>
<tr>
<td>Phage Hunting Proposal Paper</td>
<td>175</td>
</tr>
<tr>
<td>Phage Hunting Team Presentations</td>
<td>120</td>
</tr>
<tr>
<td>Peer Evaluation of Team Presentations</td>
<td>10</td>
</tr>
<tr>
<td>Phage Hunting Final Report</td>
<td>200</td>
</tr>
<tr>
<td><strong>Course Total:</strong></td>
<td><strong>1325</strong></td>
</tr>
</tbody>
</table>

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**Explanation of Assignments**

Deadlines for assignments are listed in the Course Schedule document, available on CCLE.

**Fulfillment of Laboratory Research Hours (0 pts – mandatory)**

Attendance at each lab period is required. The lab periods have strict start and end times; arriving late and/or failure to complete lab cleanup by the end of the period will result in a loss of Lab Effort and Conduct points. It is not feasible to make up laboratory work because of the complexity and cost and because many experiments involve work on materials prepared in previous lab periods. Teaching Assistants must be notified ahead of time for anticipated late arrivals to lab; TAs may lock doors at the scheduled lab start time, so plan to be early. You may have one absence from lab during the quarter; any additional absences will be excused at my discretion. Although you do not need to share with your teammates the reason for your absence, I strongly encourage you to let them know as soon as possible so that they can make arrangements for the day’s planned work. Unexcused absences after the first permitted absence may result in a penalty of up to 100 points per missed lab.

**Participation (100 pts)**

**Lecture Participation (50 pts)**
Participation by all students during lecture discussions is an important aspect of this class. The lectures are based on the reading assignments, which are designed to help you contextualize the laboratory experiments and overall project such that hypotheses can be developed and tested or results can be analyzed and conclusions made accordingly. The opportunity to participate is what you make of it – the instructors and TAs will determine your level of participation throughout the quarter and award up to 50 points as deemed appropriate. All students start at zero and must EARN these points during the lectures. You can earn points by participating in team and class discussions, asking questions, and answering questions. You must be present in class in order to participate, so although attendance is not required per se, you can’t earn participation points on days you are absent.

You may use a laptop in class to take notes, but you must stay on-task (no checking social media or surfing the web). Off-task use of laptops is highly distracting to not only the user, but also the students sitting around the person using the laptop.

**Mini-Presentations (10 ‘collaborative’ pts)**
Some weeks, teams will give short “mini-presentations” in class on the assigned topic.

**Reflection Questions and Other Participation (20 pts)**
Throughout the quarter, you will be asked to participate in activities to help the instructional staff assess our teaching and the curriculum. This may include answering content questions on ungraded concept inventories, reflection questions on your experiences in the course, and/or other questionnaires and evaluations.
Individual Progress Reports (20 pts; 10pts each)
In order to gauge individual contributions to team projects, you will be required to submit individual progress reports during Week 5 and Week 10. These progress reports should outline the status of your team’s projects so far, and detail your individual contributions to the work. These reports will be used in part to help determine Laboratory Effort and Conduct scores.

Reading Assessments (160 pts total – 20 pts each)
Eight homework assignments based primarily on the reading for lecture will be given during the quarter. These assignments are to be completed individually: you may discuss the papers with your classmates, but you must write out answers in your own words. Assignments must be posted to Gradescope at least one hour before the lecture period. Reading Assessments can be downloaded from the CCLE course page as Word documents. Your responses should be typed into the document template and saved as a PDF with the appropriate file name (see above), then uploaded to the appropriate assignment in Gradescope.

Scientific, Professional, and Personal Skill Development (50 pts)
In addition to conducting original research and learning about the field of phage biology, you will also be required to complete brief assignments focused on scientific, professional, and personal topics and skills. These may include scientific writing, literature searches, oral presentations, data analysis, exploring careers, teamwork skills, time management, and more. More detail about these assignments will be provided on CCLE.

Laboratory Etiquette and Citizenship (200 pts)

Effort & Conduct (100 pts total – 40 ‘collaborative’)
I and your TA will evaluate your overall performance in laboratory based on a number of criteria (think about ‘lab citizenry!’) including preparation for laboratory, demonstrated mastery of laboratory techniques, organization, adherence to laboratory policies (which includes following laboratory safety procedures), professional behavior during laboratory (which includes being respectful of instructors, TAs, and fellow students), and collaborative efforts between Project Team members. Points will be deducted for poor laboratory conduct at the discretion of the instructor and TA for any of the following: breaking or abusing equipment, not cleaning up properly, failure to use equipment log sheets, consistently arriving to or leaving laboratory late, unexcused laboratory absences, unwillingness to work with Project Team members on a consistent basis, etc.

Laboratory Cleanup (50 pts)
The laboratory must be left clean by all students at every lab period. At the end of each lab period, the TA will assess whether all laboratory cleanup procedures were followed and deduct points as necessary. Points may be deducted from individuals, teams, or entire lab sections. It is every student’s responsibility to maintain the laboratory environment.
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Laboratory Planning and Communication (50 ‘collaborative’ pts)
As this course is largely based on student-driven hypotheses and experiments, communication with the lab staff is extremely important. Each team will be responsible for planning their experiments each week, and communicating what materials and supplies will be needed to conduct the experiments. All materials must be requested in advance, in order to ensure that the lab staff has sufficient time to prepare them. You and your team will submit Weekly Updates to the designated https://ucla.app.box.com/ folder for your team.

Laboratory Record Keeping (215 pts)

Electronic Lab Notebook (140 pts):
You are required to maintain a laboratory notebook for detailed observations, procedures, results, data analysis, or other interesting insights. Labeled pictures of plates and gels also should be included in the notebook. Although it is electronic, you should not delete or change things after you have written them and carried out the experiment in lab; instead, update it in a font different color. Your laboratory notebook will be checked periodically throughout the quarter, so make sure to keep it up to date and complete sections on time.

Project Team Phage Database (50 collaborative pts):
In addition to the Written Laboratory Notebook, you are required to save data files (pictures of plates, microscopy, etc.) and computer-generated data (sequences, graphs, etc.) to your team’s UCLA Box.com folder throughout the quarter in appropriate subdirectories. Files should be named with the class, quarter, abbreviated team name, (assigned by the instructor), date, experiment, abbreviated host name, and a brief description.
For example: 103AL-W19_TeamName_091217_PhageName_Msmeg_lysate3-10e-4.jpg
The Phage Hunting Summary spreadsheet must be updated every lab period.

Annotation Project Notebook (25pts):
You also will complete a digital notebook as part of the microbial genome annotation project. Additional information regarding the annotation project will be provided in Friday tutorials. TAs also will check progress of the digital notebook on dates specified during the quarter to confirm students are keeping up with the annotation project.

Annotation Tutorial (95 pts)

Tutorial Participation (45 pts – 5 pts per week)
These sessions are held on Fridays in the computer lab. During these sessions, you will work directly with the instructor and TAs to become familiar with the genome annotation tools and learn how to interpret data generated during database inquiries. Note that only one excused absence is permitted during the quarter.

Annotation Final Report (50 pts total)
The Final Annotation Report will discuss the overall purpose of the manual annotation project, methods used and a thorough discussion of the data. Additional details about the report will be provided in Annotation Tutorial.

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Phage Hunting Proposal Paper (175 pts total)

Each student is required to submit a proposal paper describing the hypothesis(es) that will be tested by conducting the team project phage hunting project in MIMG 103AL. What is the overall hypothesis? How will you test your hypothesis? You should use material presented in lecture, any assigned readings associated with the lectures, and especially any information acquired from efforts outside of class as a knowledge framework upon which to build each hypothesis.

Each team will first work collaboratively to write a 2-page preliminary proposal (25 pts) of your proposed experiments, including citations.

Individual students will then write a full proposal (150 pts) which expands on the team preliminary proposal. Full guidelines will be posted to CCLE.

Phage Hunting Team Presentations (120 ‘collaborative’ pts)

You will work with your team members to prepare slides used to lead in-class presentations during Weeks 4 and 10 of the quarter. During Week 4, your team will present on your project proposal; during Week 10, you will give a more extensive presentation on your project goals, experimental strategy, and results. The score for the “collaborative presentation” that each student receives will be the same provided all team members contribute equitably; otherwise, individuals will receive the average score for their entire team.

Team Proposal Presentations will be during lab of Week 4 and are worth 20 collaborative points. Team Project Presentations will be during lecture of Week 10 and are worth 100 collaborative points.

Peer Evaluation of Week 10 Team Presentations (35 pts ‘collaborative’ points)

Attendance at team presentations is required, and ACTIVE PARTICIPATION is a must! For the Week 10 presentations, not only will you be responsible for submitting a form with feedback and constructive criticism using the criteria provided in the guidelines posted on the course website, but you will also be expected to ask questions during the 5-minute ‘Q/A’ session at the end of the presentations. Remember, lecture participation points will be assigned based on your contributions during this time. Please be constructive, not destructive!

Phage Hunting Final Report (200 pts total – 50 ‘collaborative’)

The final paper will summarize the work you and your Project Team members have performed and completed in the project. Project Team members may assist each other with the analysis and figure generation, and should discuss and debate the interpretation of the results, but each individual team member is required to write their own paper and present their own analysis of the results. Full guidelines for the report will be posted to CCLE.

The 50 collaborative points will be given for completing the Phage Database requirements for the team phage selected for EM and genome sequencing.
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Any assignment received after that time on the due date will receive a maximum of 75% credit. A maximum of only 50% credit will be given for assignments that are one day late. No credit will be given for assignments that are more than one day late. NO exceptions! Unforeseen problems sometimes do occur, so PLAN AHEAD and complete the assignment early.

Extra Credit (Up to 45 pts)

You may earn up to a maximum of 40 extra credit points during the quarter. Options for extra credit are listed below.

Syllabus Activity (5 pts)
Complete the Syllabus Activity and submit by the start of the first day of class for 5 Extra Credit points.

Microbiology in the News (Up to 10 pts)
You may post a current (less than two weeks old) news article (from popular or social media) on a topic related to microbiology to the Discussion Forum to receive 5 Extra Credit points per post, up to 10 pts total. You must post a link on CCLE to the news article and write a brief overview indicating how the article relates to the course and why you found it interesting. The article must be an original news article (i.e. not a duplicate article or topic submitted by another student), and the article MUST NOT be a primary research article. You must give a brief (1-2 minute) overview of the article to the class during lecture in order to receive credit.

UCLA Microbiology Research Seminar (10 pts)
Attend a research seminar/talk at UCLA on a microbiology, virology, or health topic. Write a summary (1 page, double-spaced) about the topic. Include the following: speaker’s name, title of the talk, general research topic, specific research problem/question, methods, major results, discussion, and potential future directions. You may attend talks with your classmates, but please be sure to take notes and write the summary in your own words. If you cannot find a seminar that works with your schedule, please ask me for suggestions.

MCDB/MIMG Undergraduate Research Poster Symposium (Up to 20 pts)
Attend the Symposium on Friday of Week 10 from 2:00 – 4:00 PM and fill out a peer evaluation form for one poster (10 extra credit points) or two posters (another 10 extra credit points). Turn in these evaluation forms at the poster session to get credit.

EIP Course Evaluations (Up to 5 pts)
Please complete the instructor/course evaluations at the end of the quarter.

Plagiarism
Much of your work will be done on teams, and using electronic documents. While you are encouraged to discuss homework and experiments with your team and share raw data, you must complete all written work individually. **Copying anyone else’s work is plagiarism and is unacceptable. Please do not share your written work with any other student, as you may also be found responsible for**
plagiarism. This class is small and it will be clear to the instructors if students’ work is similar. This includes of the lab notebook, captions on figures, answers to homework questions, lab proposals/reports, and all other work. The one exception is that you and your team may use the same hypotheses and research questions verbatim. Please speak to Dr. Freise if you have any questions about what constitutes plagiarism, and review the [UCLA Policy on Plagiarism](https://www.ucla.edu/registrar/policies/plagiarism).

**PLEASE NOTE THAT THIS SYLLABUS MAY BE REVISED OR UPDATED DURING THE QUARTER. CHANGES WILL BE ANNOUNCED IN LECTURE AND POSTED ON COURSE WEBSITE.**