

# SYLLABUS - PHAGE HUNTERS LABORATORY COURSE

## BIOL 1107 CRN 17442 - Fall 2018

**PLACE & TIME:** BIOLOGY B408, Tuesdays & Thursdays, 3:00 PM - 4:50 PM  
**INSTRUCTOR:** Germán Rosas-Acosta, MSc, PhD ([grosas3@utep.edu](mailto:grosas3@utep.edu))  
**OFFICE:** BioSciences Building, Rm.4.148; Office: (915) 747-5122  
**OFFICE HOURS:** Tuesdays & Thursdays, 12:30 - 1:30 PM

### TEACHING

**ASSISTANT:** Myriah Acuña ([mlacuna@miners.utep.edu](mailto:mlacuna@miners.utep.edu))  
**LAB COORDINATOR:** Jennifer Apodaca, PhD ([japodaca15@utep.edu](mailto:japodaca15@utep.edu))

**TEXTBOOK:** "SEA-PHAGES Laboratory Manual" by the Howard Hughes Medical Institute (manual provided online to students)

**OTHER MATERIALS:** A laboratory notebook is required (bound, hardcover)

### I. COURSE DESCRIPTION (What will you learn?):

This course is aimed at providing freshmen students a true research experience involving the search for new (never characterized before) bacteriophages capable of infecting *Arthrobacter sp.* (this is the third semester we will be using this bacterial host system) or *Microbacterium foliorum* (this will be the FIRST semester we use this host). The course is divided in two semesters: the first semester, the students will isolate and characterize new phages from the local environment; the second semester, the students will do the genomic annotation of the genome of two of the phages isolated during the first semester. This syllabus relates to the first semester of the course only. Keep in mind that by participating in the first semester, you are committing to participate in the second semester of the course as well.

### II. COURSE GOALS (What do I want you to be able to do by the time you get out of this course?):

Through this authentic laboratory research experience, the students are expected to:

- 1) Learn basic techniques necessary to grow bacteria and propagate phages.
- 2) Learn key essential laboratory skills involved in biomedical research, including experiment planning, execution, documentation, and analysis.
- 3) Become knowledgeable about the relevance of phages for the environment, for biomedical research, and for biotechnology.
- 4) Enhance the development of scientific presentation skills.
- 5) Become proficient in the use and application of basic mathematical concepts in the biomedical laboratory.
- 6) Gain a sense of what biomedical research is all about.

### III. COURSE APPROACH:

At the beginning of the course, the students will be provided with a general overview of the experimental procedures to be used throughout the semester and a sense of the goal pursued for each one of them. Then, for each laboratory session, the students will be given general and detailed guidance on the procedures to follow. The students will then be expected to assimilate the protocol they are about to implement, write it down in their laboratory notebooks and plan their time to ensure the completion of the procedure in the time available. Next, the students will collect the material needed (provided by the Teaching Assistant [TA]) to execute the procedures needed during the day, and execute the procedures needed. As the course progresses, the students will be

expected to become more independent and self-reliable, especially in terms of making decisions related to the method or procedure needed to achieve the goal in mind. At the end of the semester, each group of students is expected to give a presentation aimed at convincing their peers (and the professors and the TA) that their phage should be selected to move on to the next stage: full genome sequencing and annotation, which will be executed during the second semester of the class.

#### **IV. GRADING:**

The grading for this course will be as follows:

Quizzes	200 points
Bench proficiency (as evaluated by the professors and the TA)	100 points
Laboratory notebook	300 points
Final exam	200 points
Final Presentation	200 points
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<b>Total:</b>	<b>1000 Points</b>

The final grade equivalency will be as follows:

A = 896 pts and above	(90-100%)
B = 796 - 895 pts	(80 - 89%)
C = 696 - 795 pts	(70 - 79%)
D = 596 - 695 pts	(60 - 69%)
F = 595 pts and less	(59% and below)

**Please note that a student must earn a grade of C or better to receive credit toward graduation and no curves will be applied.**

**Laboratory notebook:** In this course you are expected to have a laboratory notebook that is dedicated exclusively to this class. This notebook is the equivalent of a real research laboratory notebook. As such, it should contain a detailed record of all the procedures that you perform in the laboratory, together with any experimental data obtained and a relatively brief description of your discussion of the data. All entries in your notebook must be dated.

**Laboratory safety:** As part of this laboratory, you will receive instruction on basic laboratory safety and blood-borne pathogens. Completion of such training releases the professors, the TA, and The University of Texas at El Paso, of any legal liability for any accidents that may occur during the execution of the experiments related to this course. By participating in this class, you accept this agreement. Students who choose to repeatedly ignore the guidelines provided for proper behavior in the laboratory may be asked to leave the laboratory, resulting in a final grade of F in this course.

#### **V. CLASS POLICIES:**

**MISSING QUIZZES:** If you miss one of the quizzes, you will receive a grade of zero in that quiz unless you provide proof that your absence was justified (either by medical reasons or by another major reason beyond your control). If you can justify your absence, your grade in the missing quiz will be the same as whatever you score in the next quiz. If there are no more quizzes after your missing quiz, then your grade will be the lowest grade you obtained in all of your quizzes.

**MISSING CLASS:** Attendance to every laboratory class is expected. If you must miss one of the labs during the semester, you should approach either the TA or one of the professors to arrange for a "make up" session. If you miss a class due to a justifiable cause, you must provide proof that your absence was justified (i.e. a medical excuse, a police report, a death certificate, etc.).

## PHAGE HUNTERS COURSE SCHEDULE

(Please be aware that this schedule is subject to change)

Session	DATE	Experimental section	Goal pursued	Ideal Time Frame for Execution and Completion
1	Sep 4	Introduction	Familiarize the students with the overall procedures to be executed and the overall goal of the course	
2	Sep 6	Aseptic technique	Familiarize the students with the basics of aseptic technique	
3	Sep 11	Capture (phage enrichment and identification of plaques)	Obtain bacteriophage plaques from the samples collected in the field	
4	Sep 13			
5	Sep 18			
6	Sep 20			
7	Sep 25	Tame (isolate the phage)	Ensure that your phage contains only one single type of phage (in other words, ensure that you have one and only one phage population that is genomically identical)	
9	Sep 27			
10	Oct 2			
11	Oct 4			
12	Oct 9			
13	Oct 11	Enrich (increase the amount of phage you have)	Obtain a high titer stock of your phage	
14	Oct 16			
15	Oct 18			
16	Oct 23			
17	Oct 25			
18	Oct 30			
19	Nov 1	Dissect (characterize your phage)	Characterize your phage by restriction analysis and electron microscopy	
20	Nov 6			
21	Nov 8			
22	Nov 13			
23	Nov 15			
24	Nov 20			
25	Nov 22	NO CLASS (Thanksgiving Break)		
	Nov 27	FINAL PRESENTATIONS	Introduce your phage to the other members of the lab and make a strong case about why your phage should be selected for the next step: genomic analysis and full genomic annotation	
26	Nov 29	Final Exam		
27	Dec 4	End of the semester party		