

Microbial Physiology 450/650 Lecture Syllabus Fall 2013
MWF 8-9am Halsey Science 367

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Office Hours: Monday 10:20-12:20 pm & Friday 10-11 am.
 Other times are available by appointment. Or contact me by email at other times.

Course Objectives: Gain a fundamental understanding of cellular composition, membrane transport, genomic diversity, horizontal gene transfer, diversity of metabolic processes, growth and cell death, communication, and techniques used to elucidate physiological processes. Integrate primary scientific literature of microbiology to further your understanding of microbial physiology. Develop scientific writing skills and critical thinking about scientific research. Learn how to plan and conduct research.

Course Readings: Readings will be posted on D2L corresponding to the lecture and lab material, which will be a collection of journal article reviews and primary literature papers that will act as the course textbook.

General Topic Outline:

Literature Searches & Course Set-up / Structure	Genomics and Microbial Physiology
Species Concept	Composition and Structure
Growth and Cell Division	Membrane Transport
Metabolism	Gene Regulation
Stress Responses	Biofilm Formation
Quorum Sensing	Horizontal Gene Transfer
Biodegradation	Stress Response
Extreme Environments	Secretion Systems
Small RNAs	

If there is something that you want to cover specifically please let me know.

Grading: Your course grade will be based on the following items:

Course Breakdown	Biol 450 Undergraduate Students	Biol 650 Graduate Students
Participation	50 pts	50 pts
Exams	320 pts	320 pts
Discussion Leadership	25	35 pts
quality discussion questions	2 pts	2.5 pts
paper choice	2 pts	2.5 pts
presentation (grad only)	----	20 pts
leading/facilitating discussion	6 pts	10 pts
written summary	15 pts	-----
Discussion Participation	70 pts	70 pts
Assignments	50 pts	50 pts
Term Paper	----	70 pts
Study Guide Questions	10 pts	5 pts
Lab Activities	425 pts	425 pts
Point Total	950 pts	1025 pts

<u>Grading Scale</u>	<i>Undergraduate</i> <u>% of Total Points</u>	<i>Graduate</i> <u>% of Total Points</u>	<u>Grade</u>
	93-100	98-100	A
	90-92.9	95-97	A-
	87-89.9	92-94	B+
	82-86.9	89-91	B
	81.9-80	86-88	B-
	77-79.9	83-85	C+
	71-76.9	79-82	C
	69-70.9	76-78	C-
	67-68.9	74-75	D+
	61-66.9	71-73	D
	60.9-60	70	D-
	≤ 60	≤ 69	F

Grade Descriptions:

- 1) Three written examinations will be given during the semester. Each exam will be made up of a combination of subjective questions (e.g. short answer, essay, data analysis) and direct content. Make-up exams will ONLY be given for documented excuses (e.g. death in the family, medical excuses, job/graduate school interview). It is the student's responsibility to schedule a make-up exam with the professor, within 48 hours of the missed exam. Exam grades will be given back and grades posted within a week of ALL students taking the exam. ***Graduate students will have different exams from the undergraduate students that require a more in-depth analysis of the topics.*** For each exam you will be given 1.5 hours to complete it, which means you can take the exam from 7:30- 9am or 8-9:30 am. Exams will be handed back about 1 week after taking each exam. (320 points)
- 2) Class participation is based on attendance and participation to in-class questions given, quizzes, data analysis or take home assignments that address topics from lecture. Participation will be scored on level of preparedness and contribution for these data analysis exercises and responses to questions. These events will occur randomly over the semester. (50 points)
- 3) Undergraduate student lead discussion: These discussions will be moderated by three to four students together. The group chooses the discussion paper dealing with a scheduled topic of microbial physiology. The group must meet with professor two weeks before the class presentation/discussion to discuss the paper choice. This meeting could be done during lab; however, if this is late you will lose 5 points from the discussion grade. *Each student needs to develop a list of three reading questions pertaining to the article*, which will be used to foster discussion among the class. Students will post their discussion questions on the D2L discussion page one week before the scheduled discussion (if this is late you will lose 5 points from the discussion grade). Each student will be graded separately on their contribution to the discussion and facilitating discussion between the class members. This means you need to try and carry the conversation. An analysis of the paper and discussion needs to be written by each student. This is due within 2 days of your discussion date to the drop-box on D2L following the grading rubric below. Late assignments will lose 10% of the total grade by each day it is late. (25 points)

Grading Rubric for Summary of Discussion Paper & Discussion 400-500 words	Total 15 pts
Items to Address in the Analysis 1) How did this paper advance your understanding of bacterial physiology? Support your answer with three elements from the paper. 2) Is the phenomenon/topic in presented in the paper applicable to all bacteria? Why or Why not? Support with three elements from the paper.	8
Using the information presented in the article how could you plan a follow-up experiment on the same topic	3
Writing Style (Grammar, Spelling, Flow of Argument)	4

- 4) ***Graduate student lead discussion.** The journal article will be chosen by the student to illustrate the scheduled topic of microbial physiology. **The student must meet with professor 2 weeks before the class presentation/discussion of the article (if this is late you will lose 5 points from the discussion grade).** The presentation should be about the background information for the topic, which should be 20 minutes long. The presentation should illustrate the BIG picture around the topic providing the students a background on the topic of the paper. You should use a minimum of 3 other publications as background information on the topic (remember you need to be the expert on this topic for the discussion). The powerpoint presentation must be posted on the D2L Discussion page for the class prior to discussion. Prepare a list of 8 reading questions that can be used generate discussion on various aspects of the paper. Design your questions in a way to engage the other class members to critically analyze the data and evaluate the topic in general. The paper and reading questions must be posted one week before your chosen discussion date (if this is late you will lose 5 points from the discussion grade). Additional papers can be suggested as supplementary readings on the topic (review articles are helpful to find background information). (35points)
- 5) Every student is required to read the paper and answer the discussion questions for each paper. ***To obtain full credit for the discussions you need to CONTRIBUTE to the discussion (70 points)!*** The discussions are used to enhance your ability to analyze scientific papers and evaluate the research.
- 6) Assignments: We will utilize bacteria that have fully sequenced and annotated genomes from the human microbiome project. We will examine genome variations, protein secretion, reconstruct essential pathways for carbon utilization, quorum sensing, secondary metabolites, and horizontal gene transfer. These assignments will be started in class and then you will finish the assignment outside the classroom. The objective here is get you familiar with utilizing the freely available data to begin to address questions about microbial function based on genomic data and application of this data. We will work with data generated for the human microbiome project. (50 points)
- 7) ***Graduate students (650 students) Term Paper:** The purpose of this term paper is to prepare you for writing, reviewing, and editing a scientific publication. You will write a mini-review of any topic that interests you covered under the umbrella of microbial physiology. You will need a minimum of FIVE peer reviewed primary literature papers from the past 3-5 years that provided you with the information about the topic. Your final paper needs to be ~4000 words, which includes abstract, title, and references. This assignment is broken into multiple parts detailed below in the grading rubric.

Mini Review Grading Rubric	70 points	Due date
Topic Idea/Outline	3	September 23 th
Meeting I w/professor where we will discuss your topic outline (All graduate students will meet together).	2	Must have meeting before Oct 4 th
Rough Draft	15	October 25 th
Meeting II/w professor to discuss how we do we review someone else's work: read Lovejoy et al 2011 Reviewing Manuscripts for Peer Review Journals: A Primer for Novice and Seasoned Reviewers. Ann Behav. Med. 42:1-13	2	Must have meeting before Oct 15 th
Rough Draft Review of Another Student's Paper	10	November 9 th
Meeting III w/professor where we will discuss your rough draft revisions based upon classmates suggestion	3	Must have meeting before Nov 25 th
Final Paper	35	December 6 th

Course Policies:

Academic Dishonesty: Cheating on an exam, plagiarizing (e.g. using information from a website, textbook, journal article, or public press without a citation), or any other form of academic dishonesty will be dealt with in accordance with the current UWO Student Discipline Code section 14. **Academic dishonesty could result in the instructor assigning a grade of "F" for the course should circumstances warrant. I TAKE ACADEMIC MISCONDUCT VERY SERIOUSLY.** If you have any questions when working on assignments for this class or any other please come. **REMEMBER WHEN IN DOUBT CITE THE SOURCE or ASK FOR HELP!**

Email: When contacting me by email include the course number (Biol 450/650) in the Subject line to make sure that your email receives a response in a timely manner. If I am unable to understand the content or context of your email, I will not respond, so please send a detailed message. (If your email is in text speak, I will not respond.) Any Email messages received after 5pm on weekdays or over the weekend, may not be responded until the next business day.

Mobile Devices: Turn off all **cell phones**, mp3players, or any other device that can be distracting to classmate prior to lecture. ***Any mobile phone use in class will results in a loss of 20 points. This also applies to lab.***

Exam Dates:

Exam 1: October 7st Covers lectures up to Oct 4th.

Exam 2: November 11th Covers lectures from Oct 9th-Nov 8nd.

Exam 3: December 11th Covers lectures from Nov 13th-Dec 6th.

Class Discussions Dates:

Discussion 1: September 13 th Professor:	Genomics-Genome Comparison
Discussion 2: September 27 th Undergraduate	Growth & Division
Discussion 3: October 14 th Graduate	Protein Secretion
Discussion 4: October 28 th Undergraduate	Carbon Utilization
Discussion 5: November 8 th Graduate	small RNAs
Discussion 6: November 25 th Undergraduate	Quorum Sensing
Discussion 7: December 6 th Graduate	Biofilm Formation

Discussion 8: December 13th Undergraduate

Horizontal Gene Transfer & Evolution