

Microbial Physiology 450/650 Lecture Syllabus Fall 2011
MWF 8-9am 3 Halsey Science 457

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Office Hours: Monday 2:30-3:30 pm & Wednesday 2-3:30 pm
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, energy generation, diversity of metabolic processes, growth and cell death, 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.

Assignments and Examinations:

- 1) Take 3 written examinations spaced evenly during the semester. Examinations 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 3 days of the missed exam. Exam grade 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. (100 points each * 3= 300 points)
- 2) Class Participation is based on attendance and participation to in-class questions given in either class 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. (100 points)
- 3) Undergraduate student lead discussion: These discussions will be moderated by two students together. The group has the choice to pick a paper dealing with a topic of microbial physiology or be given a paper for discussion by the professor. If you group chooses the paper, the group meet with professor **2 weeks** before the class presentation/discussion of the article (This meeting could be done during lab time) (if this is late you will lose 5 points from the discussion grade). ***Each student should come up with a list of 5 reading questions pertaining to the article***, which will be used to foster discussion among the class. These questions will be provided. The reading questions it should be sent out a minimum of 1 week before the discussion (if this is late you will lose 5 points from the discussion grade). The group is responsible to presenting the "big picture" leading up to this research area and summing up how this research advances microbiology. Each student will be graded separately. (Grading rubric: 10 pts for question quality, 5 pt: presentation of big picture-summary & 10 pts for facilitating discussion).
- 4) 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 (75 points)!***
- 5) Genomics Assignment: we will utilize bacteria that have fully sequenced and annotated genomes to reconstruct essential pathways for carbon utilization. This assignment will be started in class and then to be

finished 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. (25 points)

- 6) *Graduate student lead discussion. The journal article will be chosen by the student to illustrate a topic of microbial physiology. 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 a minimum of 20 minutes long. 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). Prepare a list of 5-7 reading questions that can be used generate discussion points. 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 sent out 1 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). The presentation should be 20-25 minutes in length illustrating the BIG picture around the topic providing the students enough background on the topic of the paper. (Grading Rubric: quality reading questions: 5 pts, paper choice; 5 pts, presentation; 15 pts; leading/facilitating discussion; 20 pts).
- 7) *Graduate students (650 students) need to critically analyze TWO microbiology journal articles and summarize the research article into ~500 word general news article like what would be found in Small Things Considered in Microbe (The News Magazine of the American Society for Microbiology) (www.smallthingsconsidered.us). The summary should be written for a general educated audience to convey the importance of the research in the advancement of microbiology. The research articles used for this assignment must deal with an area of microbial physiology. Your analysis should address: general area of research (background), what was the objective of the research?, what are the key findings of this research?, & how does it advance this area of microbiology?. You will have 4 due dates to choose from to turn in these microbe blogs. Late documents will lose 10% of the points per day they are late. These are due on October 15th and November 15th.

Grading Rubric (Elements of Assignment)	25
Address Main Points (3 pts per question)	12
Overall Analysis of Journal Article	5
Writing Style (Grammar, Spelling, Flow)	5
References (e.g. websites, textbooks, journal articles) (Cited in ASM style)	2
Attachment of entire original research article	1

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.**

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.

Mobile Devices: Turn off all **cell phones**, mp3players, or any other device that can be distracting to classmate prior to lecture.

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

Evaluation:

<u>Assignments</u>	<u>Value (points)</u>
Exam (3 @ 100 points each)	300
Class Participation/Attendance	100
Journal Discussion Participation (10 pts/each, 5pts/1 st one)	75
Leading Journal Discussion (450 students)	25
Journal Discussion (650 students)	50
Science Times for Microbiology ((650 students)	50
Genomics Assignment	25
Laboratory	400
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TOTAL for 450 Students	925
TOTAL for 650 Students	1025

<u>Grading Scale</u>	
<u>% of Total Points</u>	<u>Grade</u>
93-100	A
90-92.9	A-
87-89.9	B+
82-86.9	B
81.9-80	B-
77-79.9	C+
71-76.9	C
69-70.9	C-
67-68.9	D+
61-66.9	D
60.9-60	D-
less than 60	F

General Topic Outline: If there is something that you want to cover specifically please let me know:

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| 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 | CRISPRs |
| Horizontal Gene Transfer | Biodegradation |
| Microbes and Metals | Challenges of Extreme Environments |

Exam Dates:

- Exam 1: October 7st
- Exam 2: November 11th
- Exam 3: December 14th

Class Discussions Dates:

- Discussion 1: September 16th: professor
- Discussion 2: September 26th
- Discussion 3: October 5th
- Discussion 4: October 17nd
- Discussion 5: October 28th
- Discussion 6: November 9th
- Discussion 7: November 21st
- Discussion 8: December 5th