

**Microbial Physiology 450/650 Lecture Syllabus Fall 2012**  
**MWF 8-9am Halsey Science 457**

**Instructor:** Dr. Sabrina Mueller-Spitz  
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**Office Hours:** Monday 9:10-10:30 pm & Friday 1:50-3:30 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, 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.

**Course Readings:** Readings 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.

**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<br>Species Concept<br>Growth and Cell Division<br>Metabolism<br>Stress Responses<br>Quorum Sensing<br>Biodegradation<br>Extreme Environments<br>Small RNAs | Genomics and Microbial Physiology<br>Composition and Structure<br>Membrane Transport<br>Gene Regulation<br>Biofilm Formation<br>Horizontal Gene Transfer<br>Stress Response<br>Secretion Systems |
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**Grading:** Your grades will be based on:

	Biol 450 Undergraduates	Biol 650 Graduate Students
Participation	100	100
Exams	300 (100 pts each)	300 (100 pts each)
Discussion Leadership	25	50
quality reading questions	5 pts	5
paper choice	5 pts	5
summarize big picture	5	---
presentation (grad only)	---	20
leading/facilitating discussion	10	20
Discussion Participation	70	70
Genome Assignments	30	30
Microbial Blog	---	50
Lab Activities	400	400
<b>Total</b>	<b>925</b>	<b>1000</b>

## Grading Scale

<u>Undergraduate</u>	<u>Graduate</u>	<u>Grade</u>
<u>% of Total Points</u>	<u>% of Total Points</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 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.** Exams will be handed back about 1 week after taking each exam. (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. **The group meet with professor 2 weeks before the class presentation/discussion of the article. This meeting could be done during lab, however, 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. 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. (25 points)
- 4) **\*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. (50 points)

- 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) Genomics Assignment: We will utilize bacteria that have fully sequenced and annotated genomes to 1) examine bacterial diversity, 2) reconstruct essential pathways for carbon utilization, and 3) examine the genome for quorum sensing, secondary metabolites, and horizontal gene transfer. These assignments 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. (30 points)
- 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](http://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?. Late documents will lose 10% of the points per day they are late. These are due on October 12<sup>th</sup> and November 12<sup>th</sup>.

<b>Grading Rubric</b>	<b>25</b>
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. 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. Applies to lab.**

**Exam Dates:**

Exam 1: October 10<sup>st</sup> Covers lectures up to Oct 5<sup>th</sup>.

Exam 2: November 12<sup>th</sup> Covers lectures from Oct 8<sup>th</sup>-Nov 2<sup>nd</sup>.

Exam 3: December 12<sup>th</sup> Covers lectures from Nov 5<sup>th</sup>-Dec 5<sup>th</sup>.

**Class Discussions Dates:**

Discussion 1: September 14<sup>th</sup>: professor

Discussion 2: September 28<sup>th</sup>

Discussion 3: October 12<sup>th</sup>

Discussion 4: October 26<sup>th</sup>

Discussion 5: November 9<sup>th</sup>

Discussion 6: November 19<sup>th</sup>

Discussion 7: November 30<sup>th</sup>

Discussion 8: December 7<sup>th</sup>