

BMB /MICRB 450

Fall Semester 2018

Time; Location:	MW 1.25 – 2.15; 108 Wartik
Instructor:	Dr. Ola Sodeinde 120 South Frear Building 865-0004 oas1@psu.edu
Office Hours:	T, R: 10 - NOON; 1 -3 PM; also by appointment
Text:	Molecular Genetics of Bacteria
Authors:	Snyder et al; 4 th ed

COURSE DESCRIPTION and OBJECTIVES

The course will focus on understanding the mechanisms and applications of the tools of both classical and molecular genetics to the study of prokaryotic organisms. To that end, topics to be discussed will include:

1. Mutations and Genetic Analysis
2. Structure and replication of bacterial genomes (chromosomes, plasmids, etc.)
3. The organization of genes on bacterial genomes (operons, regulons, etc.)
4. Regulation of gene expression
5. DNA Repair
6. Genetic Recombination
7. Extrachromosomal DNA Elements (plasmids, transposable elements and bacteriophages)
8. Gene transfer in bacteria
9. Mechanisms of “Immunity” to foreign DNA uptake
10. Classical and molecular genetic analyses (complementation, conditional mutations, screens and selections, recombinant DNA, HTP techniques, nucleic acid mobility shift assays, blots, gene fusions, etc)

The course will include:

- Formal lecture presentations

- Student presentations. For this part, the class will be divided into groups of two or three students. I will provide a list of topics that you can choose for your presentation. Each student group is required to meet with me at least three working days prior to the date of the presentation to discuss and evaluate the material that you will be presenting to the class.

CLASS READINGS

You should read the assigned portions of the text (provided on syllabus and in the lectures) even if this material is not covered in class.

GRADING

Your final grade will be based on:

1. Performance on two in-class exams based on the formal lectures; each exam will account for 30% toward your final grade (total: 60/100%)
2. A series of short answer take home quizzes (10/100%)
3. The quality of your presentation. Group presentations will be a cooperative effort, but each group member will be graded on his/her individual contribution; this will account for 10% toward your final grade (10/100%)
4. A final exam (during finals week) that will be based on material covered during the student presentations; this will account for 20% toward your final grade (20/100%)

Grading Guidelines (I emphasize the word GUIDELINE)

90% and above: at least an A-

80% and above: at least a B-

60% and above: at least a C

50% and above: at least a D

<50%: F

Penn State Academic Integrity Policy

All Penn State policies regarding ethics and honorable behavior apply to this course (see links below for policy statements). Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. All University policies regarding academic integrity apply to this course. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. For any material or ideas obtained from other sources, such as the text or things you see on the web, in the library, etc., a source reference must be given. Direct quotes from any source must be identified as such. All exam answers must be your own, and you must not provide any assistance to other students during exams. Any instances of academic dishonesty WILL be pursued under the University and Eberly College of Science regulations concerning academic integrity.

Penn State welcomes students with disabilities into the University's educational programs.

If you have a disability-related need for reasonable academic adjustments in this course, contact the Office for Disability Services (ODS) at [814-863-1807](tel:814-863-1807) (V/TTY). For further information regarding ODS, please visit the Office for Disability Services Web site at <http://equity.psu.edu/ods/>. In order to receive consideration for course accommodations, you must contact ODS and provide documentation (see the documentation guidelines at <http://equity.psu.edu/ods/guidelines/documentation-guidelines>). If the documentation supports the need for academic adjustments, ODS will provide a letter identifying appropriate academic adjustments. Please share this letter and discuss the adjustments with your instructor as early in the course as possible. You must contact ODS and request academic adjustment letters at the beginning of each semester.”

ECoS Code of Mutual Respect and Cooperation

The Eberly College of Science Code of Mutual Respect and Cooperation (www.science.psu.edu/climate/Code-of-Mutual-Respect-final.pdf) embodies the values that we hope our faculty, staff, and students possess and will endorse to make The Eberly College of Science a place where every individual feels respected and valued, as well as challenged and rewarded.

The Eberly College of Science is committed to the academic success of students enrolled in the College's courses and undergraduate programs. When in need of help, students can utilize various College and University- wide resources for learning assistance. Visit: // <http://www.science.psu.edu/advising/success//>

DATE	LECTURE	TOPIC	PAGES
8/21	1	Introduction	1-11; 13-17
8/23	2	Mutations and Genetic Analysis	125-182
8/28	3	Mutations and Genetic Analysis	125-182
8/30	4	Mutations and Genetic Analysis	125-182
9/4		LABOR DAY - NO CLASS	
9/6	5	Mutations and Genetic Analysis	125-182
9/11	6	Replication	17-53
9/13	7	Replication	17-53
9/18	8	Transcription and Translation	67-108
9/20	9	Transcription and Translation	67-108
9/25	10	Transcription and Translation	67-108
9/27		EXAM 1	
10/2	10	Regulation of Gene Expression	Chap 12
10/4	11	Regulation of Gene Expression	Chap 12
10/9	12	Regulation of Gene Expression	Chap 12
10/11	13	Plasmids	Chap 4
10/16	14	Plasmids	Chap 4
10/18	15	Gene Transfer: Conjugation	Chap 5
10/23	16	Gene Transfer: Transformation	Chap 6
10/25	17	Gene Transfer: Transduction	314-343
10/30	18	Transposable Elements	Chap 9
11/1	19	Recombination	Chap 10
11/6	20	DNA Repair	Chap 11
11/8		Group Presentations	
11/13		Group Presentations	
11/15		EXAM 2	
11/19 - 26		THANKSGIVING	

		BREAK	
11/27		Group Presentations	
11/29		Group Presentations	
12/4		Group Presentations	
12/6		Group Presentations	

*** Please note that the schedule is not set in stone and may be altered during the semester as needed.