

MICROBIAL GENETICS

BI 410 and BI 510

MW 10:15AM-12:05PM

SRTC Rm 259

INSTRUCTOR	COURSE DESCRIPTION
Justin Courcelle 725-3866 justc@pdx.edu	The genetics of bacteria and their viruses including: replication, rearrangement, repair, transfer, regulation, and methods of manipulation and analysis of DNA.

Textbook: Molecular Genetics of Bacteria by L. Snyder and W. Champness (Any old cheap Edition).

Websites: Course homepage <http://web.pdx.edu/~justc/courses>

Office hours: Mon 2:00-4:00 SRTC Rm B2-04 or by appointment.

Exams: Exams will be in the form of short answer questions looking to determine your understanding of the material as well as your ability to interpret data

Final: One fourth of the final will be based on the material from the first two exams and three fourths of the final will be based on new material

Grading:

Exam I	30%
Exam II	30%
Final	40%

(optional) 6 Manuscript Discussions (if completed and handed in can count up to 30% of your final grade)

GLOBAL OUTLINE

I. THE BASIC MACHINERY

Chromosome Structure and Replication (Ch1)

Gene Expression, Transcription, Translation (Ch2)

II. ASEXUAL GENETIC CHANGE Parent to Daughter Cells (Vertical)

Mutations and Genetic Analysis (Ch3)

III. "SEXUAL" GENETIC CHANGE Cells Exchanging Genetic Information (Horizontal)

Plasmids (Ch4)

Conjugation (Ch5)

Transformation (Ch6)

Viral Transduction and Lytic Cell Cycles (Ch7)

Transposition (Ch9)

IV. Molecular Mechanisms of Change

The Molecular Mechanisms of Recombination (Ch10)

DNA Repair and Mutagenesis (Ch11)

There are NO makeup exams. You must take both exams and the final or you cannot earn a passing grade. If you believe you have a valid excuse for not making an exam, you must see immediately.

Academic Honesty: Acts of academic dishonesty will result a grade of zero for the assignment and may be reported to student affairs.

Students with accommodations approved through the Disability Resource Center (DRC) are responsible for contacting me prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through the DRC should contact the DRC immediately. It is the student's responsibility to make sure that their exams and finals at the DRC are scheduled to begin before class finishes on each exam day. If the student cannot schedule their exam before this time, they should see me about arranging for alternative accommodations.

As an instructor, one of my responsibilities is to help create a safe learning environment for my students and for the campus as a whole. Please be aware that as a faculty member, I have the responsibility to report any instances of sexual harassment, sexual violence and/or other forms of prohibited discrimination. If you would rather share information about sexual harassment, sexual violence or discrimination to a confidential employee who does not have this reporting responsibility, you can find a list of those individuals at <https://www.pdx.edu/sexual-assault/get-help>. For more information about Title IX please complete the required student module "Creating a Safe Campus" in your D2L.

Skills development:

1. To understand the language and basic concepts of microbial genetics.
2. To understand how vertical and horizontal genes transmission occurs
3. To understand probability concepts and use these concepts to solve problems (including basic statistical problems)
4. To understand mutagenesis, mutations, and inheritance
5. To understand the molecular basis of genetics (including such topics as replication, transcription, translation)
6. To understand the workings and importance of major genetics techniques such as PCR, and recombinering
7. To understand conjugation, transduction, and transformation, and to be able to use these as genetic tools.

Learning Objectives and Schedule

Week	Date	Topic	Chapter
1	Jan 06	Biochemistry of Replication	1
	Jan 08	Replication Fidelity	1
2	Jan 13	Transcription/Translation	2
	Jan 15	Mutants/Mutation Rates	3
3	Jan 23	No Class MLK	
	Jan 25	Mutational Selection and Screens	3
4	Jan 30	Plasmids	4
	Feb 01	EXAM I	
5	Feb 06	Plasmid Copy Number and Compatibility	4
	Feb 08	Conjugation	5
6	Feb 13	Conjugational Analysis	5
	Feb 15	Transformation	6
7	Feb 20	Viral Transduction	7
	Feb 22	EXAM II	
8	Feb 27	Phage Genetics	8
	Mar 01	Transposition	9
9	Feb 06	Molecular Mechanisms of Repair	10
	Mar 08	Molecular Mechanisms of Repair	10
10	Mar 13	Molecular Mechanisms of Recombination	11
	Mar 15	Molecular Mechanisms of Recombination	11
Mon	Mar 20	FINAL 10:15AM -12:50PM or by arrangement	